



**SOUTHERN RAILWAY
HEAD QUARTERS**

**GUIDE FOR THE CANDIDATES APPEARING FOR
SUITABILITY TEST
(COMPASSIONATE GROUND APPOINTMENT)**

FOR

JUNIOR ENGINEER

IN ALL DISCIPLINES

&

PHARMACIST

RADIOGRAPHER


**A COMPILATION OF QUESTION PAPERS OF
PREVIOUS EXAMINATIONS**

FOREWORD

One of the foremost objectives of the Ministry of Railways is to focus on the wellbeing of not only the Employees, but also their families. The system of Appointments on Compassionate Ground has been evolved with an idea of proving relief to the family due to sudden loss of income of the bread winner, consequent to demise/unfitness while in service. Compassionate Ground appointment to the eligible wards/dependents of the deceased Railway Employees has always been a priority for the Railway Administration.

I am very happy that a Guide (Comprising of previously held question papers and answers) for candidates appearing for written examination for Appointment on Compassionate Grounds conducted at Headquarters level has been brought out by Headquarters Confidential Section, which would definitely help the Wards/Dependents to equip themselves well in advance and to perform better in these Examinations.

I hope this booklet would reach all the wards/dependents who take up the tests conducted by Headquarters for Compassionate Ground Appointments.


(ARUNA NAYAR)
Principal Chief Personnel Officer
Southern Railway


PREFACE

Ministry of Railways have evolved the scheme of compassionate appointments for providing immediate relief in a situation where the bereaved family of the Railway Employee is subjected to financial distress due to the sudden loss of income of the bread winner, consequent to his death in harness or voluntary retirement due to total medical invalidation.

Appointments on Compassionate Ground are given to the eligible Wards/Dependants of the deceased Railway Employee in Group "C" cadre in Technical and Non-Technical categories by conducting suitability test for this purpose. The syllabus for the written test is in conformity with the academic/technical qualifications prescribed for the posts. The questions are objective type with multiple choice answers. In order to give sufficient exposure for the suitability tests, it has been decided to publish a question booklet.

We are happy and proud that laudable efforts with great responsibility were displayed in releasing the question booklet for the posts of Junior Engineer in all Disciplines, Pharmacist and Radiographer. Our sincere thanks to all the Railway Employees who contributed for this endeavour.

We also take this opportunity to wish the wards of the ex.Railway employees who are taking up the suitability test for their success in the examinations and subsequent career.


(S.N. KARUPPANNASWAMY)
Chief Personnel Officer/IR
Southern Railway


(A.NARAYANAN)
Chief Personnel Officer/Admn.
Southern Railway

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SOUTHERN RAILWAY

Date of Exam: 25.09.2021

**Maximum Marks: 150 x 1 Mark each
Time: 2 Hrs**

Suitability Test for Junior Engineers-Level 6 (under Compassionate grounds)

INSTRUCTION TO CANDIDATES:

- a) Candidates should write their name, Roll No., etc., only in the space provided in the fly leaf and not in any of the pages in the answer book or additional sheets.
- b) If name/roll number are found anywhere else other than the space provided for the same in the answer book or additional sheets, such papers will be disqualified.
- c) In the answers to the objective type questions, no correction of any type is permitted. In case any corrections are made, that answer shall not be evaluated at all. For example, corrections made in the objective type questions like (i) cutting (ii) over writing (iii) erasing (iv) Scoring off a ticked answer in multiple choice and re-answering the same (iv) modifying the answer in any way, will not be evaluated at all.
- d) Candidates are expected to write only correct/best option, i.e., any of the following: (A) / (B) / (C) / (D), against each question number.
For Example, if option (A) of question No.12 is correct/best option, candidate should write (A) in the answer book, against question No.12.
- e) Please ensure that the question paper contains 150 questions serially numbered and pages are numbered. Part heading if given in the question paper, it should be written by the candidates while writing Answers.
- f) The duration of the examination is 2 hours..
- g) Use space available at the end of Answer book for calculation.
- h) All question carry equal marks.
- i) All Answer/Option to be recorded in capital letters.
- j) **Deduction of marks for wrong answers (Negative answers) is not applicable.**
- k) Ink/Ball point pen only shall be used to write answers. Pencil shall not be used.
- l) **Use of calculator of any electronic devices is prohibited.**
- m) Question paper shall be returned along with Answer Book at the end of examination.

1.	The term Swachhata Pakhwada relates to		
	A. Eradication of corruption	<input checked="" type="radio"/> B.	Cleanliness and hygiene
	C. Highway density	D.	None of the above

2.	The Eden Gardens is situated in		
	<input checked="" type="radio"/> A. Kolkata	B.	Chennai
	C. Ooty	D.	None of the above

3.	In Paralympic Mariappan Thangavelu won medal in		
<input checked="" type="radio"/> A.	High jump	B.	javelin throw
<input type="radio"/> C.	Relay	D.	None of the above

4.	The 2024 Olympics will be held in		
A.	Mascow Russia	B.	London UK
<input checked="" type="radio"/> C.	Paris, France.	D.	None of the above

5.	Who is known as "The Iron Man of India"		
<input checked="" type="radio"/> A.	Shri. Sardar Vallabhai Patel	B.	Shri. M.K. Gandhi
<input type="radio"/> C.	Shri. Morarji desai	D.	None of the above

6.	The Vande Bharat Express,		
A.	Is also known as Train 18,	B.	Is semi-high-speed train
<input type="radio"/> C.	Manufactured by Integral Coach Factory,Perambur	<input checked="" type="radio"/> D.	All the above

7.	The greenhouse effect is.		
A.	a natural process that makes sea to appear blue	B.	a natural process that makes sky to appear blue
<input checked="" type="radio"/> C.	a natural process that warms the Earth's surface	D.	None of the above

8.	The new "BH" series vehicle registration system is beneficial for		
A.	Owners who uses within the one/same state	<input checked="" type="radio"/> B.	Owners who have frequent transfers to other states
<input type="radio"/> C.	Owners of foreign model cars	D.	None of the above

9.	Who has chaired the 13th BRICS Summit?		
A.	Sri. Xi Jinping	<input checked="" type="radio"/> B.	Sri.Narendra Modi
<input type="radio"/> C.	Sri. Vladimir Putin	D.	Sri. Cyril Ramaphosa

10.	Recently created Union Territory is		
A.	Puducherry	<input checked="" type="radio"/> B.	Ladakh
C.	Delhi	D.	None of the above

11.	Rail Kaushal Vikas Yojana is to		
<input checked="" type="radio"/> A.	empower youth by providing entry level training in skills relevant to industry	B.	Offer concession in trains to tourist destination
C.	Train Railway employees in the respective trade	D.	None of the above

12.	Current Chief Justice of India is		
A	Justice Chandra chud	B.	Justice Agarwal
C.	Justice Natarajan	<input checked="" type="radio"/> D.	Justice Ramana

13.	Ohm is a unit of measuring _____		
<input checked="" type="radio"/> A.	Resistance	B.	Voltage
C.	Current	D.	None of the above

14.	A Pendulum Clock, whose pendulum is made up of a steel rod, will become slow if		
A.	Temperature rises	B.	Taken to moon
C.	Taken from equator to pole	<input checked="" type="radio"/> D.	A and B

15.	Operation Flood or White Revolution is associated with		
<input checked="" type="radio"/> A.	Increasing Milk production	B.	Water Conservation
C.	Preventing Flood	D.	None of the above

16.	Father of Green Revolution in India is		
<input checked="" type="radio"/> A.	M.S. Swaminathan	B.	Vergheese Kurein
C.	V.L. Chopra	D.	None of the above

17.	The speed of the sound increases when there is an increase in the		
A.	Temperature	B.	Moisture
<input checked="" type="radio"/> C.	Both A & B	D.	None of the above

18.	While playing a flute, the flute player opens and closes the holes in the body of the flute to make changes in __:		
A.	Timbre	B.	Pitch
C.	Resonant Frequency	<input checked="" type="radio"/> D.	All the above

19.	The First Train in India ran on		
<input checked="" type="radio"/> A.	16.04.1853	B.	16.04.1953
C.	16.04.1963	D.	None of the above

20.	The spray bottles used as window or household cleaner or perfume spray works on:		
A.	Capillary action	<input checked="" type="radio"/> B.	Bernoulli's Principle
C.	Pascal's Law	D.	Stoke's Law

21.	Whose Birthday is celebrated as Engineer's day in India		
A.	Dr. Radha Krishnan	B.	Homi.J.Baba
<input checked="" type="radio"/> C.	Sir. M. Visvesvaraya	D.	None of the above

22.	Snow looks white, but water looks generally colourless. because		
A.	Snow Crystal reflect the light	B.	Snow absorbs all colors except white
C.	Snow refracts the white wavelengths of light	<input checked="" type="radio"/> D.	Snow changes the direction of light

23.	The second law of motion gives us a measure of which of the following physical quantities		
A.	Acceleration	B.	Power
<input checked="" type="radio"/> C.	Force	D.	Work done

24.	Which food delivery platform is set to onboard over 36000 street vendors under PM SVANidhi scheme		
A.	Zomato	<input checked="" type="radio"/> B.	Swiggy
C.	Domino's	D.	Dunzo

25.	In which year, first general elections to Lok Sabha were held in India		
A.	1948	B.	1949
C.	1950	<input checked="" type="radio"/> D.	1951

26.	Find the length of the tangent from a point "M" which is at a distance of 17 cm from the centre "O" of the circle of radius 8 cm.		
A.	14 cm	<input checked="" type="radio"/> B.	15 cm
C.	16 cm	D.	None of these

27.	Solve the linear equations: (1) $2x - y = 2$ (2) $x + 3y = 15$		
A.	X=4, Y=3	B.	X=3, Y=5
C.	X=5, Y=3	<input checked="" type="radio"/> D.	X=3, Y=4

28.	From a rectangular sheet of paper ABCD with AB = 40 cm and AD = 28 cm, a semi-circular portion with BC as diameter is cut off. Find the area of remaining paper		
<input checked="" type="radio"/> A.	812 sqcm	B.	924 sqcm
C.	480 sqcm	D.	None of the above

29.	$1148 / 28 \times 1408 / 32 = ?$		
A.	1800	B.	1814
<input checked="" type="radio"/> C.	1804	D.	1822

30.	The taxi charges in a city comprise of a fixed charge together with the charges for the distance covered. For a journey of 10 km the charge paid is Rs. 75 and for a journey of 15 km the charge paid is Rs. 110. What will a person have to pay for travelling a distance of 25 km		
A.	200	<input checked="" type="radio"/> B.	180
C.	250	D.	None of the above

31.	The radii of the top and bottom of a bucket of slant height 45cm are 28cm and 7 cm respectively. The curved surface area of the bucket is		
<input checked="" type="radio"/> A.	4950 sq cm	B.	4940 sq cm
C.	4930 sq cm	D.	4920 sq cm

32.	If the length of the shadow of a tower is increasing, then the angle of elevation of the sun		
A.	Have no relation ship	<input checked="" type="radio"/> B.	Is decreasing
C.	Is Increasing	D.	None of the above

33.	The body weight of Seven students of a class is recorded as 54 kg, 78 kg, 43 kg, 82 kg, 67 kg, 42 kg and 75 kg. What is the average body weight of all the seven students?		
<input checked="" type="radio"/> A.	63 Kg	B.	69 Kg
C.	71 Kg	D.	73 Kg

34.	A ladder 15 metres long just reaches the top of a vertical wall. If the ladder makes an angle of 60° with the wall, then the height of the wall will be		
A.	10.0 m	<input checked="" type="radio"/> B.	7.5 m
C.	12.0 m	D.	15.0 m

35.	The sum of two numbers is 25 and their difference is 13. Find their product.		
A.	104	<input checked="" type="radio"/> B.	114
C.	315	D.	325

36.	If a number when divided by 4, is reduced by 21, the number is		
A.	18	B.	20
<input checked="" type="radio"/> C.	28	D.	38

37.	On a morning walk, three persons step off together and their steps measure 40 cm, 42 cm and 45 cm, respectively. What is the minimum distance each should walk so that each can cover the same distance in complete steps?		
A.	2025 cm	<input checked="" type="radio"/> B.	2520 cm
C.	2555 cm	D.	2528 cm

38.	A man sitting in a train which is traveling at 50 kmph observes that a goods train, traveling in opposite direction, takes 9 seconds to pass him. If the goods train is 280 m long, find its speed.		
A.	52	B.	42
<input checked="" type="radio"/> C.	62	D.	32

39.	30% of apples out of 450 are rotten. How many apples are in good condition?		
A.	125	B.	180
C.	240	<input checked="" type="radio"/> D.	315

40.	The price of 5.5 dozen pens is Rs.1287. What is the price of 16 such pens?		
A.	Rs. 212	B.	Rs. 296
<input checked="" type="radio"/> C.	Rs. 312	D.	Rs. 412

41.	A wall of 100 metres can be built by 7 men or 10 women in 10 days. How many days will 14 men and 20 women take to build a wall of 600 metres?		
<input checked="" type="radio"/> A.	15	B.	20
C.	25	D.	30

42.	In an examination, a student scores 4 marks for every correct answer and loses 1 mark for every wrong answer. If he attempts all 60 questions and secures 130 marks, the no of questions he attempts correctly is		
A.	35	B.	12
C.	40	<input checked="" type="radio"/> D.	38

43.	If each side of a square is increased by 25%, find the percentage change in its area?		
A.	65.25 %	B.	56 %
<input checked="" type="radio"/> C.	56.25 %	D.	65 %

44.	A rectangular field is to be fenced on three sides leaving a side of 20 feet uncovered. If the area of the field is 680 sq.feet, how many feet of fencing will be required?		
A.	34	B.	40
C.	68	<input checked="" type="radio"/> D.	88

45.	In a single throw of a die, what is the probability of getting a number greater than 4?		
A.	$\frac{1}{2}$	<input checked="" type="radio"/> B.	$\frac{1}{3}$
C.	$\frac{2}{3}$	D.	$\frac{1}{4}$

46.	Find the odd man out. 6, 9, 15, 21, 24, 28, 30		
<input checked="" type="radio"/> A.	28	B.	21
C.	24	D.	30

47.	Through what angle does the minute hand of a clock turn in 5 minutes?		
<input checked="" type="radio"/> A.	30 degree	B.	32 degree
C.	35 degree	D.	36 degree

48.	Find the wrong number in the series: 1, 1, 2, 6, 24, 96, 720		
A.	720	<input checked="" type="radio"/> B.	96
C.	24	D.	6

49.	Insert the missing number. 7, 26, 63, 124, 215, 342, (....)		
A.	391	B.	421
C.	481	<input checked="" type="radio"/> D.	511

50.	A basket contains 6 blue, 2 red, 4 green and 3 yellow balls. If four balls are picked up at random, what is the probability that 2 are red and 2 are green.		
A.	4/15	B.	5/27
C.	1/3	<input checked="" type="radio"/> D.	2/455

51.	Fish : Scales :: Bear : ?		
A.	Feathers	B.	Leaves
<input checked="" type="radio"/> C.	Fur	D.	Skin

52.	Ganeshan walked 8 kms West and turned right and walked 3 kms. Then again he turned right and walked 12 kms. How far is he from the starting point?		
A.	7	B.	6
C.	4	<input checked="" type="radio"/> D.	5

53.	Find the odd activity out		
A.	Talking	B.	Walking
<input checked="" type="radio"/> C.	Sleeping	D.	Running

54.	BDAC : FHEG :: NPMO : ?		
A.	RQTS	B.	NTRC
C.	TRQS	<input checked="" type="radio"/> D.	RTQS

55.	M is the son of P. Q is the granddaughter of O who is the husband of P. How is M related to O?		
<input checked="" type="radio"/> A.	Son	B.	Daughter
C.	Mother	D.	Father

56.	Pride is to the lion as shoal is to		
<input checked="" type="radio"/> A.	Fish	B.	Teacher
C.	Student	D.	None of the above

57.	Pointing to a man in a photograph, a woman said, "His brother's father is the only son of my grandfather." How is the woman related to that man in the photograph		
A.	Mother	B.	Aunt
<input checked="" type="radio"/> C.	Sister	D.	Daughter

58.	A number of friends decided to go on a picnic and planned to spend Rs. 96 on eatables. Four of them, however, did not turn up. As a consequence, the remaining ones had to contribute Rs. 4 each extra. The number of those who attended the picnic was		
A.	24	B.	12
C.	16	<input checked="" type="radio"/> D.	8

59.	Gani was born two years after his father's marriage. His mother is five years younger than his father but 20 years older than Gani who is 10 years old. At what age did the father get married		
A.	<input checked="" type="radio"/> 23	B.	25
C.	33	D.	35

60.	If a dog is called "cat", cat is called "lion", lion is called "rat", then which of these lives in a forest		
A.	LION	B.	CAT
<input checked="" type="radio"/> C.	RAT	D.	DOG

61.	M10 grade of concrete approximates to		
A.	1 : 2 : 4	<input checked="" type="radio"/> B.	1 : 3 : 6
C.	1 : 1.5 : 3	D.	1 : 6 : 12

62.	What is the body called which does not have any tendency to recover its original configuration, on the removal of deforming force		
<input checked="" type="radio"/> A.	Perfectly plastic	B.	Perfectly elastic
C.	Perfectly ductile	D.	None of the above

63.	While passing over an obstacle a light ray slightly bends round the corner. The phenomenon is known as		
A.	Scattering	B.	Polarisation
<input checked="" type="radio"/> C.	Diffraction	D.	Refraction

64.	Which among the following are constituents of Brass?		
<input checked="" type="radio"/> A.	Zinc and Copper	B.	Iron and Zinc
C.	Copper and Nickel	D.	Iron and Copper

65.	What is the common name of Calcium Sulphate Hemihydrate		
A.	Bleaching powder	B.	Slaked lime
<input checked="" type="radio"/> C.	Plaster of paris	D.	Detergent.

66.	Which of the following equation represents combination of Hydrogen gas with nitrogen to form ammonia?		
<input type="radio"/> A.	$2H_2 + N \rightarrow NH_3$	B.	$2H + N_3 \rightarrow NH_3$
<input checked="" type="radio"/> C.	$3H_2 + N_2 \rightarrow 2NH_3$	D.	None of the above.

67.	Which of the following languages are directly executable by a computer's CPU		
<input checked="" type="radio"/> A.	Machine Language	B.	High Language
C.	Assembly Language	D.	None of the above.

68.	What is HTTP 404		
<input checked="" type="radio"/> A.	An error message indicating server not found	B.	An error message indicating moved permanently
C.	An error message indicating forbidden	D.	An error message indicating server found

69.	A piezometer opening in pipes measures		
A.	velocity head	<input checked="" type="radio"/> B.	Static head
C.	total pressure	D.	negative static pressure.

70.	The lime content in Portland cement is		
<input checked="" type="radio"/> A.	60% to 70%	B.	40% to 50%
C.	30% to 40%	D.	Less than 30%

71.	Spacing of main bars in a slab shall not exceed		
<input checked="" type="radio"/> A.	3 times the effective depth	B.	3 times the overall depth
C.	50 times the diameter of bars	D.	25 cm

NOTE For MCQ & Question Set/Answer marks can be given even if A is marked

72.	In leveling instruments, The line passing through the intersection of the horizontal and vertical cross hairs and the optical centre of the object glass and its continuation		
A.	Line of sight	<input checked="" type="radio"/> B.	Line of collimation
C.	Line of bearing	D.	None of the above

73.	Name the axis in which the telescope can be rotated in the horizontal plane?		
A.	Horizontal Axis	B.	Telescopic Axis
<input checked="" type="radio"/> C.	Vertical Axis	D.	None of the above

74.	The modulus of elasticity of steel is		
A.	150 kN/mm ²	<input checked="" type="radio"/> B.	200 kN/mm ²
C.	250 kN/mm ²	D.	275 kN/mm ²

75.	When bars of two different diameters are to be spliced, the lap length shall be calculated on the basis of		
<input checked="" type="radio"/> A.	The smaller diameter	B.	The largest diameter
C.	The average of the two diameter	D.	The sum of the two diameters.

76.	A pitot tube is used to measure		
A.	pressure	B.	difference in pressure
<input checked="" type="radio"/> C.	velocity of flow	D.	None of the above

77.	A steel rod 1 metre long having square cross section is pulled under a tensile load of 8 tonnes. The extension in the rod was 1 mm only. If $E_{steel} = 2 \times 10^6 \text{ kg/cm}^2$, the side of the rod, is		
A.	1.0 cm	B.	1.5 cm
<input checked="" type="radio"/> C.	2.0 cm	D.	2.5 cm

78.	Beams composed of more than one material, rigidly connected together so as to behave as one piece, are known as		
A.	Compound beams	B.	Indeterminate beams
C.	Determinate beams	<input checked="" type="radio"/> D.	Composite beams.

79.	Free body diagram is necessary		
<input checked="" type="radio"/> A.	to investigate the condition of equilibrium of a body	B.	To study coplanar forces
C.	to investigate the condition of colinear forces:	D.	None of the above

80.	Lami's theorem states that if three concurrent forces are acting on a body kept in an equilibrium, then each force is proportional to the ——— angle between the other two forces and the constant of proportionality is same		
A.	Cos of	B.	Tan of
<input checked="" type="radio"/> C.	Sine of	D.	None of the above

81.	A reinforced concrete slab supported by columns alone is called a		
A.	Simply supported slab	<input checked="" type="radio"/> B.	Flat slab
C.	Composite slab	D.	Continuous slab

82.	Magnitude of the force \times Perpendicular distance of the line of action of force is known as		
A.	Shear force	<input checked="" type="radio"/> B.	Moment
C.	Revolution	D.	None of the above

83.	All columns shall be designed for a minimum eccentricity of		
A.	15 mm	<input checked="" type="radio"/> B.	20mm
C.	25 mm	D.	30 mm

84.	When applied force is less than the limiting friction, then such frictional force is called		
A.	Dynamic friction	B.	Sliding friction
C.	Rolling friction	<input checked="" type="radio"/> D.	Static friction

85.	The maximum vacuum created at the summit of a syphon is		
A.	2.7 m of water	<input checked="" type="radio"/> B.	7.4 m of water
C.	3.3 m of water	D.	None of the above

86.	The phenomenon occurring in an open channel when a rapidly flowing stream abruptly changes to a slowly flowing stream causing a distinct rise of liquid surface, is		
A.	Hydraulic hammer	<input checked="" type="radio"/> B.	Hydraulic Jump
C.	Critical discharge	D.	None of the above

87.	In a pedestal of a column, the area of the longitudinal reinforcement shall not be less than		
A.	0.10 percent of gross area	B.	0.12 percent of gross area
<input checked="" type="radio"/> C.	0.15 percent of gross area	D.	0.20 percent of gross area

88.	The point through which the resultant of distributed gravity forces pass regardless of the orientation of the body in space is known as		
<input checked="" type="radio"/> A.	Centre of Gravity	B.	Moment of Inertia
C.	Shear modulus	D.	None of the above

89.	A vertical compression member used in a building is called a		
A.	Tie	B.	Strut
C.	Boom	<input checked="" type="radio"/> D.	column

90.	An ideal fluid is a fluid in which		
A.	Pressure as well as tangential stresses exist when the fluid is at rest or in motion	B.	Tangential stresses exist whether the fluid is at rest or in motion
C.	Tangential stresses exist only when the fluid is in motion	<input checked="" type="radio"/> D.	Tangential stresses are absent whether the fluid is at rest or in motion.

91.	The density of a fluid		
A.	Varies with temperature but not with pressure	<input checked="" type="radio"/> B.	Varies with temperature and pressure
C.	Varies with pressure but not with temperature	D.	Does not vary with temperature and pressure.

92.	Rocks formed by solidification of molten magma are		
A.	Metamorphic rocks	B.	Sedimentary rocks
<input checked="" type="radio"/> C.	Igneous rocks	D.	All rocks.

93.	The bond in a brick work when headers and stretchers are placed in alternate layers is called		
<input checked="" type="radio"/> A.	English bond	B.	Flemish bond
C.	Herring bone bond	D.	Header bond.

94.	A good brick should not break when dropped flat from a height of		
<input checked="" type="radio"/> A.	100 cm	B.	150 cm
<input type="radio"/> C.	175 cm	D.	200 cm.

95.	IS code which deals with imposed loads for design of building as structure (par 2)		
A.	IS 353	<input checked="" type="radio"/> B.	IS 875
C.	IS 269	D.	None of the above

96.	Stress may be defined as		
<input type="radio"/> A.	force per unit length	B.	force per unit volume
<input checked="" type="radio"/> C.	force per unit area	D.	None of the above

97.	The effective length of a compression member whose both ends are effectively held in position and restrained against rotation is (where L = Actual length)		
<input type="radio"/> A.	2.00 L	B.	1.00 L
<input checked="" type="radio"/> C.	0.65 L	D.	None of the above

98.	The buckling load for a long column is calculated based on		
A.	Pascal's formula	B.	Newton formula
<input checked="" type="radio"/> C.	Euler's formula	D.	None of the above

99.	The load on a spring per unit deflection, is called		
<input checked="" type="radio"/> A.	Stiffness	B.	proof stress
C.	proof resilience	D.	None of the above

100.	The maximum bending moment for a simply supported beam carrying UDL is given by (Where L is effective span)		
A.	$WL/4$	<input checked="" type="radio"/> B.	$WL^2/8$
C.	$WL/2$	D.	None of the above

101.	The shape of bending moment diagram of a simply supported beam carrying a point load at centre is		
<input checked="" type="radio"/> A.	Triangle	B.	Parabola
C.	Rectangle	D.	None of the above

102.	The fixed end moment of a beam carrying UDL is equal to (where W = load/unit run & L = effective span)		
<input checked="" type="radio"/> A.	$WL^2/12$	B.	$WL^2/8$
C.	$WL/4$	D.	None of the above

103.	A beam spanning over two or more support is known as		
A.	Simply supported beam	B.	Cantilever beam
<input checked="" type="radio"/> C.	Continuous beam	D.	None of the above

104.	A beam which has one end fixed and other end free is called		
A.	Fixed beam	<input checked="" type="radio"/> B.	Cantilever beam
C.	Continuous beam	D.	None of the above

105.	In compass surveying, the bearing of a line measured in the direction of the progress of the survey is called		
<input checked="" type="radio"/> A.	the fore bearing	B.	The back bearing
C.	Composite bearing	D.	None of the above

106.	The shape of shear force diagram of a cantilever beam with a point load at free end is----- (neglect self weight)		
A.	Triangle	<input checked="" type="radio"/> B.	Rectangle
C.	Parabola	D.	None of the above

107.	The vertical reaction of a simply supported beam having a point load w at middle is given by		
A.	$WL/2$	<input checked="" type="radio"/> B.	$W/2$
C.	WAL	D.	None of the above

108.	The assumption in the theory of bending of beams, is		
A.	material is homogeneous	B.	material is isotropic
C.	Young's modulus is same in tension as well as in compression	<input checked="" type="radio"/> D.	All the above

109.	The point of contraflexure is the point where		
<input checked="" type="radio"/> A.	B.M. changes sign	B.	B.M. is maximum
C.	B.M. is minimum	D.	None of the above

110.	The section modulus may be obtained by dividing the moment of inertia of the section by		
A.	depth of the section	<input checked="" type="radio"/> B.	depth of the neutral axis
C.	maximum tensile stress at the section	D.	None of the above

111.	Gunter's chain or Surveyor's chain is		
A.	100 feet long	<input checked="" type="radio"/> B.	66 feet long
C.	60 feet long	D.	None of the above

112.	In Plane surveying--		
A.	The triangle formed by any three points is considered as plane triangle	<input checked="" type="radio"/> B.	The curvature of the earth is neglected
C.	A line joining any two points is considered straight.	D.	All the above

113.	----- are ingredients other than cement, fine aggregate and coarse aggregate to improve the quality of concrete		
A.	Sand	<input checked="" type="radio"/> B.	Admixtures
C.	Blue metal	D.	None of the above

114.	Normal shear stress in beams or slabs of uniform depth is given by (where V = load; b&d = breadth and effective depth of beam/ slab)		
<input checked="" type="radio"/> A.	V/bd	B.	$V \times bd$
C.	Vb/d	D.	None of the above

115.	Workability of Concrete can be measured through		
A.	Slump cone test	B.	Flow table test
C.	Vee-Bee consistometer	<input checked="" type="radio"/> D.	All the above

116.	Property of cement to react chemically with water in an exothermic process is called		
A.	Curing	<input checked="" type="radio"/> B.	Hydration
C.	Oxidation	D.	All the above

117.	Consistency limits or Atterberg's limit is / are		
A.	Liquid Limit	B.	Plastic limit
C.	Shrinker limit	<input checked="" type="radio"/> D.	All the above

118.	The phenomenon of increase in volume of sand due to dampness is known as		
<input checked="" type="radio"/> A.	Bulking of sand	B.	Quick sand
C.	PIT sand	D.	None of the above

119.	A curve joining the points of equal stress intensity is called		
<input checked="" type="radio"/> A.	Isobar	B.	Contour
C.	Influence diagram	D.	None of the above

120.	A pile with bulb are known as		
A.	Timber pile	<input checked="" type="radio"/> B.	Under reamed pile
C.	Driven pile	D.	None of the above

121.	In a well foundation, the bottom most position is known as		
A.	Staining	B.	Top plug
<input checked="" type="radio"/> C.	Cutting edge	D.	None of the above

122.	Pile which transfer load through skin friction is known as		
A.	Bearing Piles	B.	Batter piles
<input checked="" type="radio"/> C.	Friction piles	D.	None of the above

123.	A shallow foundation according to Terzaghi is		
<input checked="" type="radio"/> A.	When width is greater than depth of foundation	B.	When width & depth of foundation is almost equal
C.	When depth of foundation is greater than its width	D.	None of the above

124.	Theodolite is a survey instrument that can measure		
A.	Vertical angles	B.	Horizontal angles
<input checked="" type="radio"/> C.	Both Vertical and Horizontal angles	D.	None of the above

125.	Find out what is/ are of the following activity forms part of Temporary adjustment of a theodolite		
A.	Setting over the station	B.	Levelling up
C.	Elimination of parallax	<input checked="" type="radio"/> D.	All the above

126.	According to _____ water cement law, the strength of concrete depends on the water cement ratio used.		
A.	Gani's	B.	Rami's
<input checked="" type="radio"/> C.	Abram's	D.	Terzhagi's

127.	In surveying, apparent movement of image with respect to cross hair is known as		
<input checked="" type="radio"/> A.	Parallax	B.	Focussing
C.	Vertex	D.	None of the above

128.	If the back sight reading on BM having value 100.00m is 3.050 and RL of Point B is 100.900, then foresight reading of point B is		
A.	3.150 m	B.	1.150 m
<input checked="" type="radio"/> C.	2.150 m	D.	None of the above

129.	The tendency of water to rise to the surface of freshly laid concrete is known as ---		
A.	Curing	<input checked="" type="radio"/> B.	Bleeding
C.	Hydration	D.	None of the above

130.	Contour is an		
A.	Fixed line on the ground joining points of equal elevation	<input checked="" type="radio"/> B.	Imaginary line on the ground joining points of equal elevation
C.	Imaginary line on the ground joining points of equal pressure	D.	None of the above

131.	The exterior angle between outer faces of a wall, is known as		
A.	Junction	B.	Turn
<input checked="" type="radio"/> C.	Quion	D.	None of the above

132.	Transition curves are having _____ between Tangent and circular curve		
A.	Fixed radius	<input checked="" type="radio"/> B.	Varying radius
C.	No radius	D.	None of the above

133.	Geodetic surveying takes into account		
<input checked="" type="radio"/> A.	Curvature of earth	B.	Mean solar time
C.	Sidereal time	D.	None of the above

134.	Black cotton soil is unsuitable for foundations because its		
A.	bearing capacity is low	B.	permeability is uncertain
<input checked="" type="radio"/> C.	Property to undergo a volumetric change due to variation of moisture content.	D.	particles are cohesive

135.	The under surface of an arch, is called		
<input checked="" type="radio"/> A.	Soffit	B.	Intrados
C.	Extrodus	D.	Haunch

136.	For Pressure on soil due to load under a footing/foundation to be fully compressive, then the Resultant force must lie		
<input checked="" type="radio"/> A.	Within middle third of the founding structure	B.	Within middle sixth of the founding structure
C.	Within middle half of the founding structure	D.	None of the above

137.	When a beam is provided to join two footings, then such foundation is known as		
A.	Strip footing	<input checked="" type="radio"/> B.	Strap footing
C.	Combined footing	D.	Mat foundation

138.	Dado is usually provided in		
A.	dinning halls	<input checked="" type="radio"/> B.	Bath rooms
C.	Bed rooms	D.	None of the above

139.	The width formation of a road means the width of		
A.	carriageway	B.	pavement
C.	embankment at ground level	<input checked="" type="radio"/> D.	embankment at the top level

140.	If V is speed in km/hour and R is radius of the curve, the super elevation e is equal to		
A.	$V^2/127R$	<input checked="" type="radio"/> B.	$V^2/225R$
C.	$V^2/325R$	D.	None of the above

141.	For the movement of vehicles at an intersection of two roads, without any interference, the type of grade separator generally preferred to, is		
A.	delta	B.	trumpet
C.	diamond interchange	<input checked="" type="radio"/> D.	clover leaf

142.	According to IRC : 52-1973, for a single lane National Highway in hilly region		
A.	width of the carriageway must be 3.75 m	B.	shoulders on either side must be 1.25 m
C.	total width of the road-way must be 6.25 m	<input checked="" type="radio"/> D.	All the above

143.	The main disadvantage of cement concrete sewers is		
A.	Less strength	B.	Difficulty in construction
<input checked="" type="radio"/> C.	Difficulty in transportation due to heavy weight	D.	Less life

144.	The type of valve which allows water to flow in one direction but prevents its flow in the reverse direction is		
<input checked="" type="radio"/> A.	Reflux valve	B.	Sluice valve
C.	Air relief valve	D.	Pressure relief valve

145.	The layout of distribution system in which water flows towards the outer periphery is		
A.	Ring system	B.	Dead end system
<input checked="" type="radio"/> C.	Radial system	D.	Grid iron system
			Correct Answer

146.	The disinfection efficiency of chlorine increases by		
A.	Decreasing the time of contact	B.	Decreasing the temperature of water
<input checked="" type="radio"/> C.	Increasing the temperature of water	D.	None of the above

147.	The chemical most commonly used to increase speed of sedimentation of sewage is		
A.	Sulphuric acid	B.	Copper sulphate
<input checked="" type="radio"/> C.	Lime	D.	Sodium permanganate

148.	In PERT analysis, the time estimates of activities and probability of their occurrence follow		
A.	Normal distribution curve	B.	Poisson's distribution curve
<input checked="" type="radio"/> C.	Beta distribution curve	D.	None of the above

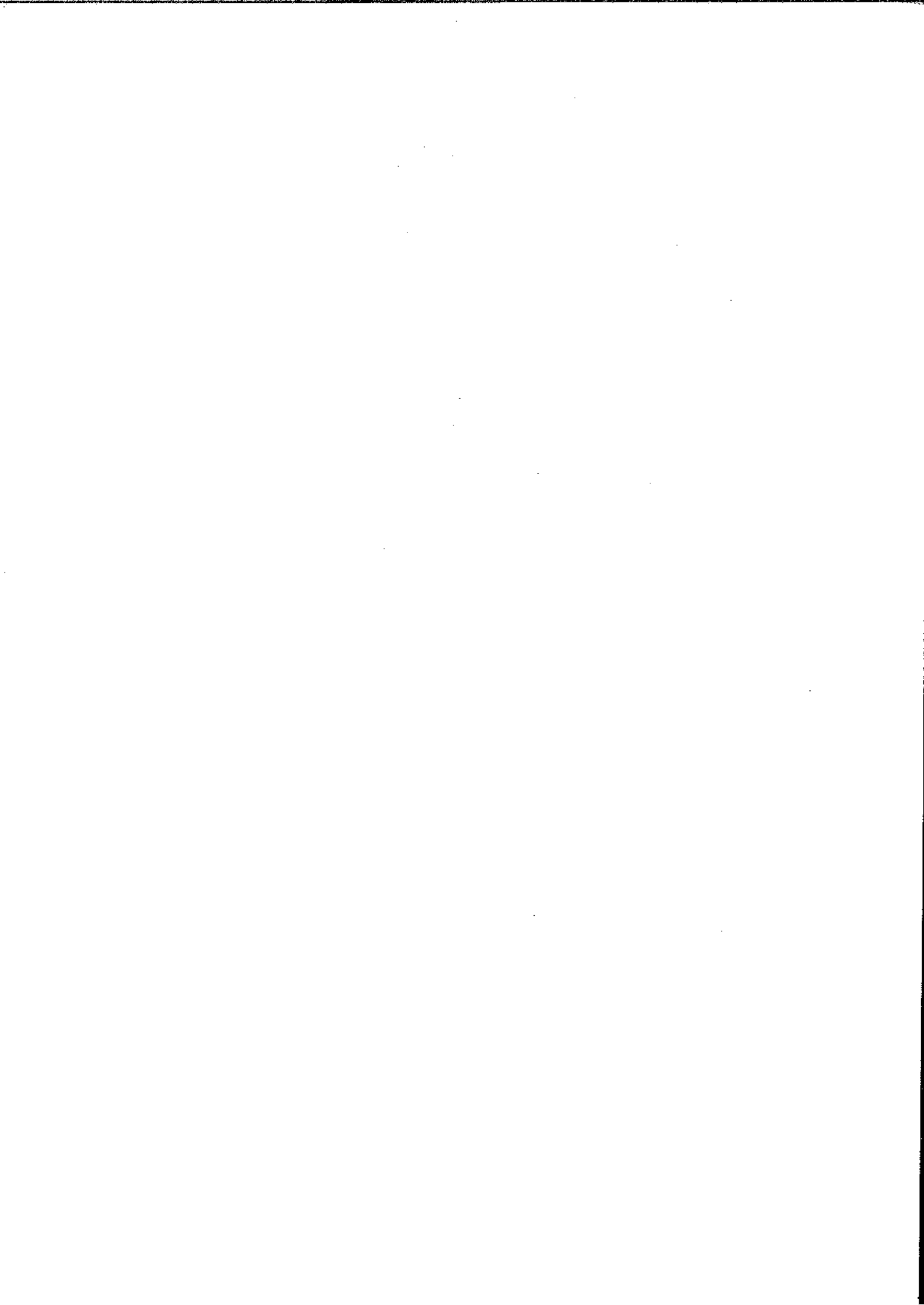
149.	A dummy activity is		
A.	Is artificially introduced	B.	Is represented by a dotted line
C.	Does not consume time	<input checked="" type="radio"/> D.	All the above

150.	Mile Stone charts were invented in the year		
A.	1910	B.	1920
C.	1930	<input checked="" type="radio"/> D.	1940



Suitability Test for Junior Engineers-Level 6 (under compassionate Ground) -Answer Key

Q.No	Ans	Q.No	Ans	Q.No	Ans	Q.No	Ans	Q.No	Ans	Q.No	Ans
1	B	26	B	51	C	76	C	101	A	126	C
2	A	27	D	52	D	77	C	102	A	127	A
3	A	28	A	53	C	78	D	103	C	128	C
4	C	29	C	54	D	79	A	104	B	129	B
5	A	30	B	55	A	80	C	105	A	130	B
6	D	31	A	56	A	81	B	106	B	131	C
7	C	32	B	57	C	82	B	107	B	132	B
8	B	33	A	58	D	83	B	108	D	133	A
9	B	34	B	59	A	84	D	109	A	134	C
10	B	35	B	60	C	85	B	110	B	135	A
11	A	36	C	61	B	86	B	111	B	136	A
12	D	37	B	62	A	87	C	112	D	137	B
13	A	38	C	63	C	88	A	113	B	138	B
14	D	39	D	64	A	89	D	114	A	139	D
15	A	40	C	65	C	90	D	115	D	140	B
16	A	41	A	66	C	91	B	116	B	141	D
17	C	42	D	67	A	92	C	117	D	142	D
18	D	43	C	68	A	93	A	118	A	143	C
19	A	44	D	69	B	94	A	119	A	144	A
20	B	45	B	70	A	95	B	120	B	145	C
21	C	46	A	71	A	96	C	121	C	146	C
22	D	47	A	72*	B or A*	97	C	122	C	147	C
23	C	48	B	73	C	98	C	123	A	148	C
24	B	49	D	74	B	99	A	124	C	149	D
25	D	50	D	75	A	100	B	125	D	150	D



SOUTHERN RAILWAY

SUITABILITY TEST FOR JUNIOR ENGINEER (ON COMPASSIONATE GROUNDS)

Date of Exam: 23.07.2021

Maximum Marks: 150

Time: 2 Hrs

INSTRUCTION TO CANDIDATES:

- a) Candidates should write their name, Roll No., etc., only in the space provided in the fly leaf and not in any of the pages in the answer book or additional sheets.
- b) If name/roll number are found anywhere else other than the space provided for the same in the answer book or additional sheets, such papers will be disqualified.
- c) In the answers to the objective type questions, no correction of any type is permitted. In case any corrections are made, that answer shall not be evaluated at all. For example, corrections made in the objective type questions like (i) cutting (ii) over writing (iii) erasing (iv) Scoring off a ticked answer in multiple choice and re-answering the same (iv) modifying the answer in any way, will not be evaluated at all.
- d) Candidates are expected to write only correct/best option, i.e., any of the following: (A) / (B) / (C) / (D), against each question number.
For Example, if option (A) of question No.12 is correct, candidate should write (A) in the answer book, against question No.12.
- e) Please ensure that the question paper contains 150 questions serially numbered and pages are numbered. Part heading given for each part shown in the question paper should be written by the candidates while writing Answers.
- f) The duration of the examination is 2 hours. Part heading given for each part shown in the Question paper should be written by the candidates while writing Answers.
- g) Use space available at the end of Answer book for calculation.
- h) All question carry equal marks.
- i) All Answer/Option to be recorded in capital letters.
- j) Deduction of marks for wrong answers (Negative answers) is not applicable.
- k) Ink/Ball point pen only shall be used to write answers. Pencil shall not be used.
- l) Use of calculator of any electronic devices is prohibited.
- m) Question paper shall be returned along with Answer Book at the end of examination.

PART – A

GENERAL AWARENESS AND GENERAL KNOWLEDGE

1. The Present Minister for Indian Railway is
A. Shri. Ashwini Vaishnav
B. Shri. Piyush Goyal
C. Shri. Suresh Prabhu
D. None of the above
2. The Headquarter of Southern Railway is at
A. Kolkata
B. Chennai
C. Trivandrum
D. None of the above
3. Which is the biggest planet in our Solar System
A. Mercury
B. Jupiter
C. Mars
D. None of the above
4. Which is the largest Continent in the world
A. Antarctica
B. North America
C. Asia
D. None of the above
5. Who is known as "The Iron Man of India"
A. Shri. Sardar Vallabhai Patel
B. Shri. M.K. Gandhi
C. Shri. Morarji desai
D. None of the above
6. What is the National animal of India?
A. Peacock
B. Elephant
C. Tiger
D. None of the above
7. What is the National flower of India?
A. Lotus
B. Rose
C. Jasmine
D. None of the above

8. Kargil Vijay Diwas is observed on
- A. 20th June every year
B. 26th July every year
C. 3rd May every year
D. None of the above
9. The Longest River in India
- A. Godavari
B. Ganga
C. Yamuna
D. None of the above
10. Recently created Union Territory is
- A. Puducherry
B. Ladakh
C. Delhi
D. None of the above
11. The Official language of India is
- A. English
B. Tamil
C. Hindi in Devanagari Script
D. None of the above
12. The Railway track between Mettupalayam and Ooty is a
- A. BG Track
B. Mixed Gauge Track
C. MG Track
D. None of the above
13. Quit India Movement is started by _____ as part of freedom struggle.
- A. Gandhiji
B. Nehruji
C. Mountbatten
D. None of the above
14. Jallianwala bagh Massacre took place in the year
- A. 1920
B. 1919
C. 1932
D. None of the above
15. Operation Flood or White Revolution is associated with
- A. Increasing Milk production
B. Water Conservation
C. Preventing Flood
D. None of the above

16. Father of Green Revolution in India is
- A. M.S. Swaminathan
B. Verghese Kurein
C. V.L. Chopra
D. None of the above
17. Miss. _____ from Tamilnadu and also a Railway employee is part of 4X400m Indian mixed Relay team for Tokyo Olympics.
- A. Sankari Madhusoodan
B. Revathi veeramani
C. Nirmala Pandian
D. None of the above
18. Mission Swachh Bharat is associated with
- A. Green Revolution
B. Clean India
C. Literacy India
D. None of the above
19. The First Train in India ran on
- A. 16.04.1853
B. 16.04.1953
C. 16.04.1963
D. None of the above
20. The Famous Brihadeeswar Temple in Tamilnadu is constructed by
- A. Pandian King
B. Raja Raja Chola King
C. Chandra Gupta Maurya
D. None of the above
21. Whose Birthday is celebrated as Engineer's day in India
- A. Dr. Radha Krishnan
B. Homi.J.Baba
C. Sir. M. Visvesvaraya
D. None of the above
22. Grand Anaicut or Kallanai is an ancient Dam constructed across
- A. River Tamarabharani
B. River Vaigai
C. River Cauvery
D. None of the above
23. "VIBGYOR" Term is associated with
- A. Eatables
B. Film
C. Rainbow
D. None of the above

24. Approximate time taken for the Sunlight to reach earth is
- | | | | |
|----|--------------|----|-------------------|
| A. | 8.30 Minutes | B. | 6.30 Minutes |
| C. | 4.20 Minutes | D. | None of the above |
25. The Major nutrition of Rice is
- | | | | |
|----|--------------|----|-------------------|
| A. | Potassium | B. | Fat |
| C. | Carbohydrate | D. | None of the above |

PART B
ARITHMETIC

26. Which of the following is always odd?
- | | | | |
|----|----------------------------|----|-------------------------------|
| A. | Sum of two odd numbers | B. | Difference of two odd numbers |
| C. | Product of two odd numbers | D. | None of these |
27. The face Value of 8 in the number 458926 is
- | | | | |
|----|------|----|------|
| A. | 8 | B. | 1000 |
| C. | 8000 | D. | 8926 |
28. What Mathematical operation should come at the place of ? in the equation
 $2 ? 6 - 12/4 + 2 = 11.$
- | | | | |
|----|--------------------|----|--------------|
| A. | + (plus) | B. | - (minus) |
| C. | X (multiplication) | D. | / (division) |
29. $1148/28 \times 1408 / 32 = ?$
- | | | | |
|----|------|----|------|
| A. | 1800 | B. | 1804 |
| C. | 1814 | D. | 1822 |
30. $(9)^3 \times (6)^2 \div (3)^3 = ?$
- | | | | |
|----|-----|----|------|
| A. | 948 | B. | 972 |
| C. | 984 | D. | 1012 |

52. Laxmi is elder than Meenu, Leela is elder than Meenu but younger than Laxmi. Lata is younger than both Meenu but Hari and Hari is younger than Meenu. Who is the youngest ?
- A. Laxmi
B. Meenu
C. Leela
D. Lata
53. Select related word
Canvas : Painter :: ?
- A. Marble : Sculptor
B. Chisel : Wood
C. Leather : Shoe
D. Brush : Palette
54. Select related word
Earth : Moon :: ?
- A. Elephant : Ant
B. Sun : Uranus
C. Ship : Boat
D. Asia : India
55. Which one of the given responses would be a meaningful order of the following ?
1. Pass 2. Medal 3. Result 4. School 5. Examination
- A. 4, 5, 3, 1, 2
B. 5, 3, 1, 2, 4
C. 4, 5, 1, 2, 3
D. 4, 1, 5, 2, 3
56. Find out the correct answer
 $5 \times 6 \times 4 = 456$, $3 \times 6 \times 5 = 536$, $4 \times 8 \times 7 = ?$
- A. 847
B. 784
C. 748
D. 478
57. A class of boys is standing in a long queue. Sundar is standing at 29th place in order from both ends. How many boys are there in the class ?
- A. 47
B. 58
C. 57
D. 59
58. O is the wife of N. Q is the son of O. M is the Brother of N and father of P. How is Q related to P
- A. Cousin
B. Uncle
C. Sister
D. Maternal Uncle

59. Ganesh was born on 28 February of a year. If in that year Republic Day fell on Sunday, then on which day was Ganesh born
- | | |
|-----------|-------------|
| A. Friday | B. Saturday |
| C. Sunday | D. Monday |
60. If a clock rings once at 1 O' clock, twice at 2 O' clock, thrice at 3 O' clock and so on, i.e., it rings as many times as its time, then how many times does it ring in 24 hours ?
- | | |
|--------|--------|
| A. 48 | B. 150 |
| C. 156 | D. 200 |

PART - D

TECHNICAL ABILITY

61. The modular ratio between steel and any grade of concrete is given by (Where σ_{cbc} = permissible compressive stress due to bending in concrete in N/mm²)
- | | |
|-------------------------|-------------------------|
| A. $270/3 \sigma_{cbc}$ | B. $280/3 \sigma_{cbc}$ |
| C. $380/3 \sigma_{cbc}$ | D. $385/3 \sigma_{cbc}$ |
62. When a body is totally or partially immersed in a fluid, the upward force acting on the body is
- | | |
|--------------------|---------------------|
| A. Surface tension | B. Buoyancy |
| C. Drag | D. Specific gravity |
63. OPC means
- | | |
|-------------------------------|-----------------------------|
| A. Ordinary Portland cement | B. Oxidised Portland cement |
| C. Oxiginised Portland cement | D. None of the above |
64. The IS code which deals with code of practice for plain and Reinforced concrete is
- | | |
|------------|-----------------------|
| A. IS: 456 | B. IS:800 |
| C. IS:383 | D. None of the above. |

65. The Ratio of stress/strain is known as
- A. Modulus of Rupture
B. Shear Modules
C. Young's Modulus or modulus of Elasticity
D. None of the above.
66. Granite is a
- A. Igneous type of rock
B. Sedimentary rock
C. Metamorphic rock
D. None of the above.
67. A brick placed with its length parallel to the face of the wall is called a
- A. Stretcher
B. Header
C. Closer
D. None of the above.
68. Water absorption of first class brick after 24 hours immersion is
- A. 10%
B. 15%
C. 20%
D. 25%
69. A good brick should not break when dropped flat from a height of
- A. 100 cm
B. 150 cm
C. 175 cm
D. 200 cm
70. The lime content in Portland cement is
- A. 60% to 70%
B. 40% to 50%
C. 30% to 40%
D. Less than 30%
71. Spacing of main bars in a slab shall not exceed
- A. 3 times the effective depth
B. 3 times the overall depth
C. 50 times the diameter of bars
D. 25 cm
72. The lower edge of inclined roof is called
- A. Ridge
B. Gable
C. Flashing
D. Eaves

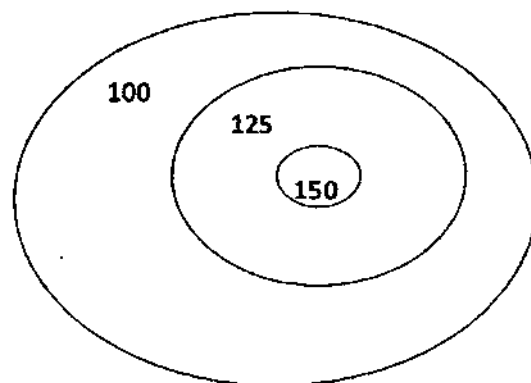
73. The minimum diameter of longitudinal bars in a column is
- | | |
|---------|---------|
| A. 8mm | B. 10mm |
| C. 12mm | D. 16mm |
74. The modulus of elasticity of steel is
- | | |
|---------------------------|---------------------------|
| A. 150 kN/mm ² | B. 200 kN/mm ² |
| C. 250 kN/mm ² | D. 275 kN/mm ² |
75. When bars of two different diameters are to be spliced, the lap length shall be calculated on the basis of
- | | |
|------------------------------------|----------------------------------|
| A. The smaller diameter | B. The larger diameter |
| C. The average of the two diameter | D. The sum of the two diameters. |
76. A simply supported beam shall be deemed to be a deep beam when the ratio of the effective span to overall depth
- | | |
|------------------------|----------------------|
| A. Is less than 2 | B. Is greater than 2 |
| C. Is greater than 2.5 | D. Is greater than 3 |
77. The nominal shear stress in concrete in an R.C. singly reinforced beam section is (Where $a =$ area; $b =$ breadth ; d & D are effective as overall depth of beam, $S = SF$)
- | | |
|-----------|----------------------|
| A. S/ab | B. S/bD |
| C. S/bd | D. None of the above |
78. A doubly reinforced section is provided instead of a singly reinforced section
- | | |
|--------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| A. Since the doubly reinforced section is economical | B. Since the reinforcement requirement is less |
| C. When the moment of resistance has to be substantially increased without increasing the depth of the beam. | D. To provide symmetry of reinforcement. |
79. For a simply supported slab spanning in one direction, the span to effective depth ratio should not exceed
- | | |
|-------|-------|
| A. 15 | B. 18 |
| C. 20 | D. 25 |

80. A slab will be designed as spanning one way if the ratio of the long span to short span is greater than
- | | |
|---------|---------|
| A. 1.5 | B. 1.70 |
| C. 1.75 | D. 2 |
81. A reinforced concrete slab supported by columns alone is called a
- | | |
|--------------------------|--------------------|
| A. Simply supported slab | B. Flat slab |
| C. Composite slab | D. Continuous slab |
82. A reinforced concrete column is a compression member, the effective length of which exceeds
- | | |
|--------------------------------------------|-------------------------------------------|
| A. The least lateral dimension | B. Two times the least lateral dimensions |
| C. Three times the least lateral dimension | D. Four times the least lateral dimension |
83. All columns shall be designed for a minimum eccentricity of
- | | |
|----------|----------|
| A. 15 mm | B. 20mm |
| C. 25 mm | D. 30 mm |
84. The area of longitudinal reinforcement in on RCC column shall not be less than
- | | |
|---------------------------|---------------------------|
| A. 0.6% of the gross area | B. 0.7% of the gross area |
| C. 0.8% of the gross area | D. 1% of the gross area |
85. The minimum number of longitudinal bars in a column of rectangular section in
- | | |
|------|------|
| A. 1 | B. 2 |
| C. 3 | D. 4 |
86. Forms for R.C.C columns may be removed after
- | | |
|----------------|-------------------|
| A. 3 to 4 days | B. 5 days |
| C. 7 days | D. 24 to 48 hours |

87. In a pedestal of a column, the area of the longitudinal reinforcement shall not be less than
- | | | | |
|----|----------------------------|----|----------------------------|
| A. | 0.10 percent of gross area | B. | 0.12 percent of gross area |
| C. | 0.15 percent of gross area | D. | 0.20 percent of gross area |
88. For rivets of nominal diameter less than or equal to 25mm, the diameter of the rivet hole shall be taken as
- | | | | |
|----|--------------------------------------|----|------------------------------------|
| A. | Nominal diameter of the rivet | B. | Nominal diameter of the rivet +1mm |
| C. | Nominal diameter of the rivet +1.5mm | D. | Nominal diameter of the rivet +2mm |
89. A vertical compression member used in a building is called a
- | | | | |
|----|------|----|--------|
| A. | Tie | B. | Strut |
| C. | Boom | D. | Column |
90. An ideal fluid is a fluid in which
- | | | | |
|----|--------------------------------------------------------------------------------------|----|---------------------------------------------------------------------------|
| A. | Pressure as well as tangential stresses exist when the fluid is at rest or in motion | B. | Tangential stresses exist whether the fluid is at rest or in motion |
| C. | Tangential stresses exist only when the fluid is in motion | D. | Tangential stresses are absent whether the fluid is at rest or in motion. |
91. The density of a fluid
- | | | | |
|----|-----------------------------------------------|----|----------------------------------------------|
| A. | Varies with temperature but not with pressure | B. | Varies with temperature and pressure |
| C. | Varies with pressure but not with temperature | D. | Does not vary with temperature and pressure. |
92. Rocks formed by solidification of molten magma are
- | | | | |
|----|-------------------|----|-------------------|
| A. | Metamorphic rocks | B. | Sedimentary rocks |
| C. | Igneous rocks | D. | All rocks. |
93. The bond in a brick work when headers and stretchers are placed in alternate layers is called
- | | | | |
|----|-------------------|----|--------------|
| A. | English bond | B. | Flemish bond |
| C. | Herring bone bond | D. | Header bond. |

118. The phenomenon of increase in volume of sand due to dampness is known as
- | | |
|--------------------|----------------------|
| A. Bulking of sand | B. Quick sand |
| C. PIT sand | D. None of the above |
119. A curve joining the points of equal vertical stress/pressure intensity is called
- | | |
|----------------------|----------------------|
| A. Isobar | B. Contour |
| C. Influence diagram | D. None of the above |
120. A pile with bulb are known as
- | | |
|----------------|----------------------|
| A. Timber pile | B. Under reamed pile |
| C. Driven pile | D. None of the above |
121. In a well foundation, the bottom most portion is known as
- | | |
|-----------------|----------------------|
| A. Steining | B. Top plug |
| C. Cutting edge | D. None of the above |
122. Pile which transfer load through skin friction is known as
- | | |
|-------------------|----------------------|
| A. Bearing Piles | B. Batter piles |
| C. Friction piles | D. None of the above |
123. A shallow foundation according to Terzaghi is
- | | |
|-------------------------------------------------------|-----------------------------------------------------|
| A. When width is greater than depth of foundation | B. When width & depth of foundation is almost equal |
| C. When depth of foundation is greater than its width | D. None of the above |
124. Theodolite is a survey instrument that can measure
- | | |
|----------------------------------------|----------------------|
| A. Vertical angles | B. Horizontal angles |
| C. Both Vertical and Horizontal angles | D. None of the above |
125. Find out what is/ are of the following activity forms part of Temporary adjustment of a theodolite
- | | |
|-----------------------------|------------------|
| A. Setting over the station | B. Levelling up |
| C. Elimination of parallax | D. All the above |

126. MSL means
- | | |
|---------------------|----------------------|
| A. Medium sea level | B. Mean sea level |
| C. Middle sea level | D. None of the above |
127. In surveying, apparent movement of image with respect to cross hair is known as
- | | |
|-------------|----------------------|
| A. Parallax | B. Focussing |
| C. Vertex | D. None of the above |
128. If back sight on BM having value 100.00 m is 2.080 m and foresight of a point 'X' is 4.560 m, then RL of Point X is
- | | |
|--------------|----------------------|
| A. 102.080 m | B. 104.560 m |
| C. 97.520 m | D. None of the above |
129. Find out correct statement (in Rise and fall method of surveying)
- | | |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------|
| A. $\sum B.S - \sum F.S = \sum Rise - \sum Fall = Last\ RL - First\ RL$ | B. $\sum B.S + \sum F.S = \sum Rise + \sum Fall = Last\ RL - First\ RL$ |
| C. $\sum B.S - \sum F.S = \sum Rise + \sum Fall = Last\ RL + First\ RL$ | D. None of the above |
130. Contour is an
- | | |
|------------------------------------------------------------------|-------------------------------------------------------------------|
| A. Fixed line on the ground joining points of equal elevation | B. Imaginary line on the ground joining points of equal elevation |
| C. Imaginary line on the ground joining points of equal pressure | D. None of the above |
131. The following Contour figure represents



- | | |
|-----------|----------------------|
| A. Valley | B. Hill |
| C. RIDGE | D. None of the above |

132. Transition curves are having
- | | | | |
|----|--------------------------------------------------|----|----------------------------------------------------|
| A. | Fixed radius between Straight and circular curve | B. | Varying radius between straight and circular curve |
| C. | No radius between Straight and circular curve | D. | None of the above |
133. Geodetic surveying takes into account
- | | | | |
|----|--------------------|----|-------------------|
| A. | Curvature of earth | B. | Mean solar time |
| C. | Sidereal time | D. | None of the above |
134. Hair crack in plaster
- | | | | |
|----|----------------------------------------|----|-------------------------------------|
| A. | Are harmful | B. | Do not disappear with white washing |
| C. | Disappear generally with white washing | D. | None of the above |
135. When two members, which are to be connected are simply overlapped and connected together by means of bolts or welds, then such joints are called
- | | | | |
|----|-------------|----|-------------------|
| A. | Butt joint | B. | Lap joint |
| C. | Cover Joint | D. | None of the above |
136. POT-PTFE bearings are used
- | | | | |
|----|----------------------------------------------------|----|-------------------|
| A. | For box culverts | B. | For Arch Bridges |
| C. | For Long span bridges with Beam and decking system | D. | None of the above |
137. The thickness of angle ISA 65 x65 x 6 mm
- | | | | |
|----|------|----|--------|
| A. | 7 mm | B. | 6.5 mm |
| C. | 6 mm | D. | 3 mm |
138. King post trusses are used for
- | | | | |
|----|-----------------|----|-------------------|
| A. | Small spans | B. | Large spans |
| C. | Bowstring spans | D. | None of the above |

139. Anchor bolts of a structure to be designed for
- | | |
|-----------------------|---------------------------|
| A. Compressive forces | B. Uplift /tensile forces |
| C. Shear forces | D. None of the above |
140. The Bacteria present in septic tank to break down solid waste is
- | | |
|--------------|----------------------|
| A. Anaerobic | B. Aerobic |
| C. e-coli | D. None of the above |
141. In a drain, the velocity of flow that prevents settlement of solids is known as
- | | |
|----------------------------|-----------------------|
| A. Optimum velocity | B. Turbulent velocity |
| C. Self cleansing velocity | D. None of the above |
142. In a public water distribution system, chlorination is done
- | | |
|---------------------------------------|----------------------|
| A. To add taste | B. To add colour |
| C. To prevent bacterial contamination | D. None of the above |
143. The term "Aquifer" is connected to
- | | |
|------------------------------------|------------------------------------------|
| A. The strata holding ground water | B. The strata under foundation of column |
| C. The strata holding coral reefs | D. None of the above |
144. For a Truss to be a perfect frame, the following equation to be satisfied
- | | |
|-------------------|----------------------|
| A. $N = (2j - 3)$ | B. $N = (2j + 3)$ |
| C. $N = (2j - 1)$ | D. None of the above |
145. In multi storied buildings, to prevent breaking up of the water seal of the trap of lower floor toilets,
- | | |
|------------------------------------|-------------------------------|
| A. Soil pipe is provided | B. Siphonage pipe is provided |
| C. Anti-siphonage pipe is provided | D. None of the above |

//Confidential //

Southern Railway

No.W.NB.JE/Bridge Exam

Headquarters Office,
Works Branch,
Chennai- 600 003.

Dated.: 26.07.2021.

Dy.CE/TP/Hqrs

Sub: Appointment on compassionate grounds – Conducting Suitability Test for Junior Engineer in Engineering Department in Level -6 in 7th PC - reg.

Ref: Dy.CPO/R&W Ir.No. PB/CS/30/Policy/Technical Categories/Vol.IV dated -07-2021.

The signed key answer for the examination held on 23.07.2021 is enclosed herewith in a sealed cover for further action.

N
BALASUBRAMANIAN
N
Digitally signed by N
BALASUBRAMANIAN
Date: 2021.07.26 13:25:43
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Dy.CE/Bridges/Hqrs

Encl: As above

Copy to: Dy.CPO/R & W - for information.

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SUITABILITY TEST FOR JUNIOR ENGINEER ON 23.07.2021

(ON COMPASSIONATE GROUNDS)

1.	A	26.	C	51.	D	76.	A	101.	A	126.	B
2.	B	27.	A	52.	D	77.	C	102.	A	127.	A
3.	B	28.	C	53.	A	78.	C	103.	C	128.	C
4.	C	29.	B	54.	B	79.	C	104.	B	129.	A
5.	A	30.	B	55.	A	80.	D	105.	A	130.	B
6.	C	31.	D	56.	C	81.	B	106.	B	131.	B
7.	A	32.	D	57.	C	82.	C	107.	A	132.	B
8.	B	33.	A	58.	A	83.	B	108.	A	133.	A
9.	B	34.	D	59.	A	84.	C	109.	C	134.	C
10.	B	35.	B	60.	C	85.	D	110.	B	135.	B
11.	C	36.	C	61.	B	86.	D	111.	A	136.	C
12.	C	37.	A	62.	B	87.	C	112.	B	137.	C
13.	A	38.	C	63.	A	88.	C	113.	A	138.	A
14.	B	39.	D	64.	A	89.	D	114.	A	139.	B
15.	A	40.	C	65.	C	90.	D	115.	A	140.	A
16.	A	41.	A	66.	A	91.	B	116.	A	141.	C
17.	B	42.	A	67.	A	92.	C	117.	D	142.	C
18.	B	43.	A	68.	C	93.	A	118.	A	143.	A
19.	A	44.	D	69.	A	94.	A	119.	A	144.	A
20.	B	45.	B	70.	A	95.	B	120.	B	145.	C
21.	C	46.	A	71.	A	96.	C	121.	C	146.	C
22.	C	47.	A	72.	D	97.	C	122.	C	147.	B
23.	C	48.	B	73.	C	98.	C	123.	A	148.	A
24.	A	49.	A	74.	B	99.	A	124.	C	149.	A
25.	C	50.	D	75.	A	100.	B	125.	D	150.	A



SOUTHERN RAILWAY
Suitability Test for Junior Engineer
in Engineering Department in Level 6 in 7th PC

Date of Exam: 29/02/2020

Time: 2 hours

Maximum Marks: 150

The following are the standard/general instructions to the candidates:

- a) Candidates should write their name, Roll No., etc., only in the space provided in the fly leaf and not in any of the pages in the answer book or additional sheets.
- b) If name/roll number are found anywhere else other than the space provided for the same in the answer book or additional sheets, such papers will be disqualified.
- c) In the answers to the objective type questions, no correction of any type is permitted. In case any corrections are made, that answer shall not be evaluated at all. For example, corrections made in the objective type questions like (i) cutting (ii) over writing (iii) erasing (iv) scoring off a ticked answer in multiple choice and re-answering the same (iv) modifying the answer in any way, will not be evaluated at all.
- d) Candidates are expected to write only correct/best option, i.e. any of the following:
(A) / (B) / (C) / (D), against each question number.
For example, if option (A) of question No.12 is correct, candidate should write (A) in the answer book, against question No.12.
- e) Please ensure that the question paper contains 150 questions serially numbered and pages are numbered.
- f) The duration of the examination is 2 hours.
- g) Use space available at the end of Answer Book for calculation.
- h) All question carry equal marks.
- i) All Answer/Option to be recorded in capital letters.
- j) Deduction of marks for wrong answers (Negative answers) is not applicable.
- k) Ink/Ball point pen only shall be used to write answers. Pencil shall not be used.
- l) Use of calculator of any electronic devices is prohibited.
- m) Question paper shall be returned along with Answer Book at the end of examination.

Choose the correct answer from the options given:

150 x 1 = 150 Marks

1. Which Indian State has the longest coastline?
A) Andhra Pradesh B) Maharashtra C) Gujarat D) Tamil Nadu
2. Which writ is issued in case of illegal detention of a person?
A) Mandamus B) Certiorari C) Habeas Corpus D) Quo Warranto
3. The final power to reprieve or remit a punishment or to commute death sentence rests with the
A) Prime Minister B) Law Minister C) President D) Attorney General
4. India is a
A) Capitalist State B) Totalitarian State C) Bilingual State D) Secular State
5. All responsibilities regarding elections in India are entrusted to:
A) President B) Prime Minister
C) Chief Justice D) Chief Election Commissioner
6. At which steel plant is stainless steel produced in India?
A) Durgapur B) Salem C) Bokaro D) Bhilai
7. The Cauveri river flows into the:
A) Bay of Bengal B) Arabian Sea C) Palk Strait D) None of the above
8. At which place will you find maximum sunlight in December?
A) Kanya Kumari B) Pune C) Kolkatta D) Leh
9. Which is the National Bird of India?
A) Sparrow B) Swan C) Peacock D) Pigeon
10. India's number one tea producing State is :
A) Jammu & Kashmir B) Assam
C) Kerala D) Tamil Nadu
11. The thin layer of gas in the upper atmosphere of the Earth, which protects life from the ultraviolet rays coming from outer space, mainly contains:
A) Inert gases B) Ozone C) Carbon-di-oxide D) Nitrogen
12. A person is moving downward in a lift. His apparent weight is:
A) Infinite B) More than his actual weight
C) Less than his actual weight D) Zero
13. Which type of objects can be seen when kept in a dark room?
A) Transparent B) Opaque C) Luminous D) Red colour
14. Electric Transformer is used to
A) Regulate current B) Regulate amperage of current
C) Change voltage D) All the above

15. Blood of which group can be given to a person whose blood group is 'O'?
- A) AB B) O C) A D) B
16. Atmospheric pressure is measured in:
- A) Ergs B) Degrees C) Bars D) None of the above
17. The direction and velocity of wind is recorded continuously by
- A) Barometer B) Machmeter C) Anemometer D) Sclerometer
18. One square meter is equal to
- A) 100 square centimeters B) 1000 square centimeters
C) 10,000 square centimeters D) 1,000,000 square centimeters
19. We are asked to wear white clothes in summer because?
- A) They look more graceful B) They are visible from a long distance
C) White absorbs less heat D) It is only a convention
20. Name of the Indian born lady who went to space for the first time is
- A) Alpana Chawla B) Kalpana Khosla C) Bachichendri Pal D) Kalpana Chawla
21. How many poles are present in a magnet?
- A) One B) Two C) Three D) Four
22. Who was the first foreign traveler who came to India?
- A) Ibn Batuta B) Fahein C) Hiuen-Tsang D) Marcopolo
23. The temples in Tanjore and Chidambaram are the best architectural specimen of the
- A) Chalukyas B) Rastrakutas C) Hoyasalas D) Cholas
24. Gautama Buddha attained enlightenment at a place known as
- A) Gaya B) Bodh Gaya C) Rajgir D) Pawapuri
25. Who was the first and last Indian Governor General of India?
- A) Shri. Rajendra Prasad B) Shri. Rajagopalachari
C) Shri. Zakir Hussain D) Lord Mountbatten
26. A bottle contains 920 ml of Mustard oil. The total quantity of oil contained in 25 such bottle is _____.
- A) 23 liters B) 25 liters C) 24 liters D) 22 liters
27. The largest four digit and smallest four digit numbers using the digits 4,0,3,7 is _____.
- A) 4370, 4307 B) 3740, 3047 C) 7403, 3704 D) 7430, 3047
28. 55 kg 200 g of sugar is distributed among 12 persons. The quantity of sugar received by each person is _____.
- A) 4 kg 200 g B) 4 kg 400 g C) 4 kg 600 g D) 4 kg 800 g

29. A machine produce 2825 Screws in a day and after a month (30 days), these screws are distributed equally to five dealers in different parts of the city. The number of screws each dealer got is _____.
- A) 16950 B) 17000 C) 17500 D) 84750
30. The number with which 82 is multiplied so that product remains the same is _____.
- A) 82 B) 0 C) $1/82$ D) 1
31. The integer which is 2 more than $[-7 + (-2)]$ is _____.
- A) -7 B) -9 C) 11 D) -3
32. Bala's monthly salary is ₹ 12000/-. He spends ₹ 1450/- for his son's education, ₹ 550/- for purchasing clothes, ₹ 450/- for purchasing vegetables, milk, etc., ₹ 1500/- for purchasing medicine and pays a rent of ₹ 5000/- in a particular month. How much does he save in this month?
- A) ₹ 4255/- B) ₹ 4960/- C) ₹ 3165/- D) ₹ 3050/-
33. The numbers which are not multiples of 2 are called _____ numbers.
- A) Even B) Odd C) Prime D) Composite
34. Which of the following numbers is a perfect square?
- A) 36 B) 81 C) 37 D) Both (A) and (B)
35. 1265 is divisible by
- A) 2 B) 3 C) 10 D) 11
36. Bala turns right angle three times. How many degrees does he turn through?
- A) 90° B) 180° C) 330° D) 270°
37. Which solid has the greatest number of faces?
- A) Cone B) Cylinder C) Triangular prism D) Cube
38. Which number should come in place of \square ?
- $$\frac{1}{7} + \frac{2}{7} + \frac{\square}{7} = 1 \frac{3}{7}$$
- A) 1 B) 2 C) 3 D) 7
39. What fraction of one metre is 10 cm?
- A) $1/10$ B) $1/100$ C) $100/100$ D) $9/100$
40. Mrs. Soni bought $7 \frac{1}{2}$ liters of milk. Out of this milk, $5 \frac{3}{4}$ litres was consumed. How much milk is left with her?
- A) $1 \frac{3}{4}$ liters B) $1 \frac{4}{7}$ liters C) $1 \frac{5}{2}$ liters D) $1 \frac{2}{5}$ liters
41. A boy weighs 56.74 kg. If his father is 1.5 times heavier than his son, then the weight of the father is _____.
- A) 85 kg B) 85.11 kg C) 85.20 kg D) 85.15 kg

42. Which of the following fraction is equal to 0.67?
 A) $\frac{1}{3}$ B) $\frac{2}{3}$ C) $\frac{3}{4}$ D) $\frac{3}{5}$
43. A man covers a journey by car in 3 hours. He covers a distance of 64 km 324 m during the first hour, 58 km 56 m during the second hour and 62 km 8m during the third hour. What is the length of his journey?
 A) 184 km 388m B) 184 km 380 m C) 184 km 308 m D) 184 km 3088 m
44. 80 students of the same height stand with both hands stretched all along the sides of a rectangular garden, each student covering a length of 1.75 m. Then the perimeter of the garden is
 A) 1400 m B) 140 m C) 14 m D) 1400 km
45. The area of a square is numerically equal to the perimeter of the square, then the side of square is _____.
 A) 2 units B) 3 units C) 4 units D) 5 units
46. The total cost of flooring a room at ₹ 8.50 per sq metre is ₹ 510. If the length of the room is 8 metre. Find its breadth.
 A) 7.4 m B) 7.5 m C) 8.5 m D) 5.8 m
47. Half of a number is added to 18, then the sum is 46. The number is _____.
 A) 92 B) 56 C) 65 D) 0
48. A bus travels 126 km in 3 hours and a train travels 315 km in 5 hours. The ratio of their speed is _____.
 A) 126:315 B) 2:3 C) 1:3 D) 3:5
49. In a Joint family, there are father, mother, 4 married sons and three unmarried daughters. Of the sons, two have 2 daughters each, and two have a son and a daughter each. How many female members are there in the family?
 A) 15 B) 12 C) 14 D) 11
50. If MONDAY is coded as 123456 and BELT is coded as 0789, how would you encode the word TOMBAY?
 A) 921056 B) 460528 C) 290165 D) 258702
51. Which of the following will come next in the series?
 A B D C E F H
 A) GH B) IG C) GI D) KL
52. Mark the appropriate answer which completes the series.
 1 4 9 16 25 ____
 A) 33 B) 36 C) 30 D) 256

53. UMPIRE is to CRICKET as _____ is to HOCKEY.
 A) PLAYER B) CAPTAIN C) REFEREE D) SPECTATOR
54. Which is the odd month out _____
 A) March B) April C) May D) July
55. In certain code, DELHI is written as FGNJK. How will you write KANPUR?
 A) LBOQVS B) MCPRWT C) JZMOTQ D) MPCTWR
56. Which of the following will come next in the series?
 0 2 6 12 20 30 42 ?
 A) 56 B) 54 C) 50 D) 72
57. A doctor gives Bala five tablets asking him to take each one after half an hour. How long will he take to finish all the tablets.
 A) 1.5 hours B) 2 hours C) 2.5 hours D) 3 hours
58. Pick the odd man out _____.
 A) Bowl B) Plate C) Spoon D) Table E) Fork
59. Which is the missing number?
 16/37 28/49 41/62 58/?
 A) 83 B) 51 C) 79 D) 80
60. Hands are to GLOVES as LEGS are to
 A) Shoes B) Socks C) Sandals D) Boots
61. A 1st class brick immersed in water for 24 hours should not absorb water (by weight) more than
 A) 10 % B) 15 % C) 20% D) 25%
62. Bulking of sand is caused due to
 A) Surface moisture B) Air voids C) Viscosity D) All the above
63. Strength of cement concrete primarily depends upon
 A) Quality of water B) Quantity of aggregate
 C) Quantity of cement D) Water cement ratio
64. Seasoning of timber is done
 A) To make it water proof B) To increase its temperature
 C) To paint its surface D) To remove water
65. The most valuable timber may be obtained from
 A) Chir B) Shisham C) Sal D) Teak
66. The most commonly used base for timber painting is
 A) Red lead B) Zinc white C) White lead D) Titanium White

67. PVC stands for
 A) Plastic Very Compact
 B) Polythene Vinyl Chloride
 C) Polythene Vinyl Carbon
 D) Polythene Vanadium Carbide
68. The maximum bearing capacity of soil is that of
 A) Black cotton soil
 B) Fine sandy soil
 C) Coarse sandy soil
 D) Hard rocks
69. The brick laid with its length parallel to the face of a wall is known as
 A) Header
 B) Stretcher
 C) Closer
 D) None of the above
70. The arrangements made to support an unsafe structure temporarily, is known as
 A) Shoring
 B) Scaffolding
 C) Under pinning
 D) Jacking
71. The type of bond in which every course contains both headers and stretchers is called
 A) English Bond
 B) Flemish Bond
 C) Stretcher Bond
 D) Header Bond
72. To construct a 10 cm thick partition wall, you will prefer
 A) English bond
 B) Flemish bond
 C) Header bond
 D) Stretcher bond
73. A wall constructed to resist the pressure of an earth filling, is called
 A) Retaining wall
 B) Breast wall
 C) Buttress
 D) Parapet wall
74. The strength of brick masonry in 1:6 cement mortar is
 A) 20 tonnes/m²
 B) 40 tonnes/m²
 C) 50 tonnes/m²
 D) 60 tonnes/m²
75. The concrete slump recommended for beams and slabs, is
 A) 25 to 50 mm
 B) 25 to 75 mm
 C) 30 to 125 mm
 D) 50 to 100 mm
76. For plastering the exposed brick walls, the cement mortar should be
 A) 1:2
 B) 1:3
 C) 1:4
 D) 1:6
- 77) An imaginary line joining the points of equal elevation on the surface of earth, represents
 A) Contour surface
 B) Contour gradient
 C) Contour line
 D) Level line
- 78) The property by which a body returns to its original shape after removal of force, is called
 A) Plasticity
 B) Elasticity
 C) Ductility
 D) Malleability
- 79) The distance between the centres of adjacent rivets in the same row, is called
 A) Pitch
 B) Lap
 C) Gauge
 D) Staggered pitch
- 80) The bending moments is maximum on a section where shear force
 A) is maximum
 B) is minimum
 C) is equal
 D) changes sign
- 81) Hooke's law states that stress and strain are
 A) Directly proportional
 B) inversely proportional
 C) Curvilinearly related
 D) None of these

- 82) A long vertical member, subjected to an axial compressive load, is called
 A) A column B) a strut C) a tie D) a stanchion
- 83) A member which does not regain its original shape after removal of load producing deformation is said
 A) Plastic B) Elastic C) Rigid D) None of these
- 84) Humidity refers to
 A) Temperature of the air B) Pressure of the air
 C) Moisture content of the air D) Volume of the air
- 85) The standard height of a standard Rain gauge is
 A) 10 cm B) 20 cm C) 30 cm D) 50 cm
- 86) The settlement of a particle in sedimentation tank is affected by
 A) Velocity of flow B) Velocity of water
 C) Size and shape of solid D) All the above
- 87) Turbidity of water may be caused due to
 A) Suspended clay B) Suspended silt
 C) Finely divided organic material D) All the above
- 88) Alum is chemically
 A) Copper Sulphate B) Aluminium Sulphate
 C) Ferrous Sulphate D) Ferric Sulphate
- 89) Filtration of water is done to remove
 A) Colour B) Odour C) Turbidity D) Pathogenic Bacteria
- 90) The best process of disinfection of public water supply is by
 A) Boiling B) Chlorination C) Adding Lime D) Adding Ozone
- 91) The pH value of water fit for drinking is
 A) 13 B) 11 C) 9 D) 7
- 92) Chlorination of water is done for the removal of
 A) Bacterials B) Suspended Solids C) Sediments D) Hardness
- 93) The level of underground water is called
 A) Water level B) Water Table C) Negative level D) Invert level
- 94) Cohesion-less soil is
 A) Sand B) Silt C) Clay D) Clay and Silt
- 95) The liquid and plastic limits exist in
 A) Sandy soils B) Silty soil C) Gravel soils D) Clay soils

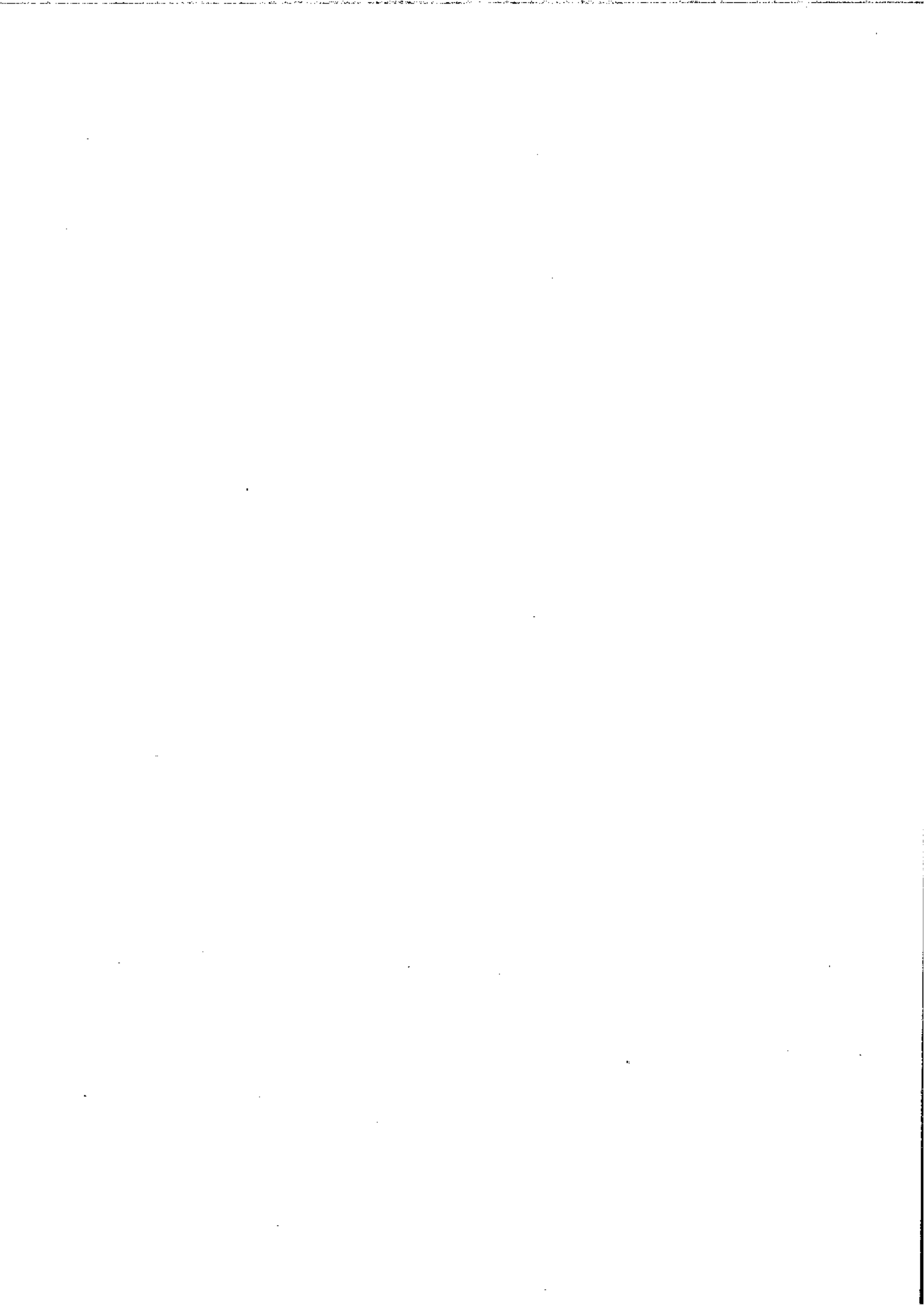
- 96) The ultimate bearing capacity of a soil, is
 A) Total load on the bearing area
 B) Safe load on the bearing area
 C) Load at which soil fails
 D) Load at which soil consolidates
- 97) Separation of coarse aggregates from mortar during transportation, is known
 A) Bleeding
 B) Creeping
 C) Segregation
 D) Shrinkage
- 98) Concrete mainly consists of
 A) Cement
 B) Aggregates
 C) water
 D) All the above
- 99) Sand generally contains salt if it is obtained from
 A) Nala beds
 B) River beds
 C) Sea beds
 D) All the above
- 100) I.S.I has specified the full strength of concrete after
 A) 7 days
 B) 14 days
 C) 21 days
 D) 28 days
- 101) The grade of concrete M 150 means that compressive strength of a 15 cm cube after 28 days is
 A) 100 kg / cm²
 B) 150 kg / cm²
 C) 200 kg / cm²
 D) 250 kg / cm²
- 102) To prevent segregation, the maximum height for placing concrete, is
 A) 100 cm
 B) 125 cm
 C) 150 cm
 D) 200 cm
- 103) The process of hardening the concrete by keeping its surface moist is known
 A) Placing
 B) Wetting
 C) Curing
 D) Compacting
- 104) Construction joints are generally provided in concrete
 A) Roads
 B) Retaining walls
 C) Lining of canals
 D) All the above
- 105) Bulking of sand is
 A) Mixing of different sizes of sand particles
 B) Mixing of lime with sand
 C) Missing of water with sand
 D) Swelling of sand when wetted
- 106) The size of fine aggregate does not exceed
 A) 2.75 mm
 B) 3.00 mm
 C) 3.75 mm
 D) 4.75 mm
- 107) M 150 grade of concrete approximates
 A) 1:3:6 mix
 B) 1:1:2 mix
 C) 1:2:4 mix
 D) 1 : 1.5: 3 mix
- 108) The advantage of a concrete pile over a timber pile, is
 A) No decay due to termites
 B) No restriction on length
 C) higher bearing capacity
 D) All the above
- 109) Total pressure on the vertical face of a retaining wall of height 'h', acts parallel to free surface and from the base at a distance of
 A) h/4
 B) h/3
 C) h/2
 D) 2 h/3

- 110) The minimum head room over a stair must be
 A) 200 cm B) 205 cm C) 210 cm D) 220 cm
- 111) Useful soil moisture for plant growth is
 A) Capillary water B) Gravity water
 C) Hygroscopic water D) Chemical water
- 112) In water bound macadam roads, binding material used is
 A) Sand B) Stone dust C) Cement D) Brick dust
- 113) If the elevation along a road increase, the slope of the road along the longitudinal direction is known as
 A) Gradient B) Grade C) Positive grade D) Negative grade
- 114) Raising of outer edge of a road with respect to inner edge is known as
 A) Super elevation B) Cant C) Banking D) All the above
- 115) When an up-gradient of a highway meets a downgrade, the vertical curve provided, is known as
 A) Valley curve B) Sag curve C) Summit curve D) All the above
- 116) Gauge of a Permanent Way is
 A) Minimum distance between running faces of rails
 B) Minimum distance between outer faces of rails
 C) Distance between centre of rails
 D) Width of formation
- 117) Rail section is generally designated by its
 A) Total weight B) Total length
 C) Weight per metre length D) Area of its cross section
- 118) The main function of sleepers is
 A) To support rails
 B) To hold rails at correct gauge
 C) To distribute load from the rails to ballast
 D) All the above
- 119) The main advantage of a PSC sleeper is
 A) Its heavy weight which improves the track modulus
 B) Its capacity to maintain gauge
 C) Its suitability for track circuiting
 D) All the above
- 120) In a Permanent Way, ballast
 A) Transfers load from sleepers to the formation
 B) Provides an elastic bed to the track
 C) Provide drainage to track
 D) All the above

- 121) If 'G' is gauge in metres, 'V' is speed of trains in km/hour and R is radius of a curve in metres, the equilibrium super elevation is
 A) GV^2 / R B) $GV^2 / 27 R$ C) $GV^2 / 127 R$ D) $G^2V^2 / 125 R$
- 122) Arrangement made to divert the trains from one track to another, is known as
 A) Railway Junction B) Grade Separator C) Points and crossing D) None of these
- 123) The SI unit of force is
 A) Newton B) Kilograms C) Joule D) Erg
- 124) A body is said to be in equilibrium, if it –
 A) moves horizontally B) moves vertically
 C) rotates about its C.G D) None of these
- 125) The order of booking the dimension is
 A) length, breadth, height B) breadth, length, height
 C) height, breadth, length D) None of these
- 126) Terracotta is essentially
 A) an igneous rock B) a sedimentary rock
 C) a clay product D) a burnt up brick
- 127) If the grade of concrete changes from M 150 to M 200, the value of E
 A) increases B) decreases C) remains constant D) not measurable
- 128) The foundation which consists of a thick reinforced cement slab covering whole area to support heavy concentrated structural load is known as
 A) Combined footing B) Strap footing
 C) Raft footing D) None of the above
- 129) In ordinary residential and public buildings, the damp proof course is generally provided at
 A) ground level B) plinth level C) water table level D) midway ground level
- 130) Ornamental moulded course placed on the top of a wall is
 A) Cornice B) Coping C) Frieze D) Lintel
- 131) Crown is located at
 A) Highest point on the extrados of the arch
 B) Highest point on the intrados of the arch
 C) Skew-back of the arch
 D) None of these
- 132) The voussoir placed at crown of an arch is known as a
 A) Key B) Soffit C) Springer D) Haunch
- 133) In verandah floor outside slope is
 A) 1 in 40 B) 1 in 50 C) 1 in 60 D) 1 in 70

- 134) The main principle of surveying is to work
 A) from part to the whole B) from whole to the part
 C) from higher level to the lower level D) from lower level to the higher level
- 135) Short offsets are measured with
 A) an ordinary chain B) an invar tape
 C) a metallic tape D) a steep tape
- 136) Before discharge the foul sewage into rivers, it is generally treated by
 A) Screening
 B) Sedimentation
 C) Oxidation, sludge digestion and disinfection
 D) All the above
- 137) In sewers, the effect of scouring is more on
 A) Top B) Bottom C) Horizontal side D) On sides
- 138) A circular sewer section is preferred to because
 A) it is cheaper in construction
 B) it provides maximum area for a given perimeter
 C) it provides maximum hydraulic mean depth
 D) all the above
- 139) 'Cowl' is provided at
 A) lower end of ventilating column
 B) upper end of ventilating column
 C) upper end of the manhole
 D) first step in manhole
- 140) Surface water is obtained from
 A) well B) springs C) artesian well D) rain
- 141) Aeration of water is done to remove
 A) odour B) bacterias C) turbidity D) colour
- 142) E-coli bacteria die in water having pH greater than
 A) 5.5 B) 6.5 C) 7.5 D) 9.5
- 143) Chlorination of water is done for the removal of
 A) bacterials B) suspended solids C) sediments D) hardness
- 144) If the failure of a finite slope occurs through the toe, it is known as
 A) slope failure B) face failure C) base failure D) toe failure
- 145) Efflorescence in cement is caused due to an excess of
 A) alumina B) iron oxide C) silica D) alkalis

- 146) Vicat's apparatus is used for
A) Fineness test B) consistency test C) setting time test D) soundness test
- 147) Strength of concrete with passage of time
A) increase B) decreases C) fluctuates D) remains constant
- 148) The rails get out of their original positions due to insufficient expansion gap. This phenomenon is known as
A) hogging B) bucking C) creeping D) none of these
- 149) The first stage of a construction is
A) preparation of estimate B) survey of the site
C) initiation of proposal D) preparation of tender
- 150) Bar charts are suitable for
A) minor works B) major works C) large projects D) all the above
-



**Question paper for the suitability test for Junior Engineer
in Engineering Department on Compassionate Grounds**

Date of Examination : 10/10/2019

Time: 2 hours

INSTRUCTIONS:

Standard/ General instructions to the candidates for the post of Junior Engineer:

- a) Candidates should write their name, Roll No., etc., only in the space provided in the fly leaf and not in any of the pages in the answer book or additional sheets.
- b) If name/roll number are found anywhere else other than the space provided for the same in the answer book or additional sheets, such papers will be disqualified.
- c) In the answers to the objective type questions, no corrections of any type is permitted. In case any corrections are made, that answer shall not be evaluated at all. For example, corrections made in the objective type questions like
 - (i) cutting
 - (i) over writing
 - (ii) erasing
 - (iv) scoring off a ticked answer in multiple choice and re-answering the same
 - (v) modifying the answer in any way, will not be evaluated at all.
- d) Candidates are expected to write only correct/best option, i.e. any of the following:
(A)/ (B) (C) / (D) and (E) – as required, against each question number.
For example, if option (A) of question No.12 is correct, candidate should write (A) in the answer book, against question No. 12
- e) Please ensure that the question paper contains 150 questions serially numbered and pages are numbered.
- f) The duration of the examination is 2 hours.
- g) Use space available at the end of Answer Book for calculation.
- h) All question carry equal marks.
- i) All Answer/Option to be recorded in capital letters.
- j) Deduction of marks for wrong answers (Negative answers) is **not applicable.**
- k) Ink/Ball point pen only shall be used to write answers. Pencil shall not be used
- l) Use of calculator or any electronic devices is prohibited.
- m) Question paper shall be returned along with Answer Book at the end of examination.



**Question paper for the Suitability Test for Junior Engineer
in Engineering Department on Compassionate Grounds**

Date of Examination : 10/10/2019

Marks: 150

Time: 2 hours

INSTRUCTIONS

- i. Question paper contains 150 Objective Type questions with multiple choice.
- ii. Answer all the following questions.
- iii. All answers in capital letters to be written on the answer sheets provided for the purpose.
- iv. Nothing should be written on the question paper.
- v. For the answer to objective questions, no corrections of any type should be made. If any corrections are made, such answer will not be valued.
- vi. Each question carries equal marks.
- vii. Detailed instructions are given in a separate sheet. Read them carefully and follow.

150 x 1 = 150 Marks

1. A man went uphill with a speed of 20 kmph and came downhill with a speed of 30 kmph. The average speed for his journey was:
A. 25 kmph
B. $22 \frac{1}{2}$ kmph
C. 24 kmph
D. $25 \frac{1}{2}$ kmph
2. A can do half of a piece of work in one day whereas B can do full, B can do half the work as C in one day. Ratio of their efficiencies is
A. 4 : 2 : 1
B. 2 : 4 : 1
C. 2 : 1 : 4
D. 1 : 2 : 4
3. One third of a certain journey was covered at a rate of 25 km per hour, one fourth at the rate of 30 km per hour and the rest at the rate of 50 km per hour. The average speed for the whole journey is
A. $33 \frac{1}{3}$ km/hr
B. $66 \frac{1}{3}$ km/hr
C. $36 \frac{1}{6}$ km/hr
D. $63 \frac{1}{3}$ km/hr
4. Some persons can do a piece of work in 12 Days. Two times the number of these persons will do half of that work in
A. 3 days
B. 4 days
C. 6 days
D. 12 days
5. The average age of A and B is 20 years. If C were to replace A, the average would be 19 and if C were to replace B, the average would be 21. The ages of A, B and C are (in years)
A. 22, 17, 16
B. 22, 18, 20
C. 30, 18, 15
D. 23, 17, 15

6. A and B put in Rs.300 and Rs.400 respectively into a business. A reinvests into the business his share of the first year's profit of Rs.210 whereas B does not. In what should they divide the second year's profit?
- A. 39 : 40
 - B. 40 : 39
 - C. 03 : 04
 - D. 39 : 49
7. 40% of a man's daily output is equal to 60% of a second man's daily output. If the first man turns out 1440 toys everyday, the second man's output in terms of number of toys is
- A. 960
 - B. 1000
 - C. 840
 - D. 900
8. Three measuring rods are 64 cm, 80 cm and 96 cm in length. What is the least length of cloth that can be measured exact number of times using any one of these rods?
- A. 9.60 m
 - B. 8 m
 - C. 9.06 m
 - D. 96 m
9. 9men and 12 boys finish a job in 12 days. 12 men and 12 boys finish it in 10 days. In how many days will 10 men and 10 boys finish the job?
- A. 8 days
 - B. 10 days
 - C. 12 days
 - D. None of these
10. 2, 6, 12, 20, 30, 42 ?
- A. 50
 - B. 52
 - C. 54
 - D. 56
11. 3, 5, 9, 15, 25, 41, 67 ?
- A. 108
 - B. 52
 - C. 110
 - D. 111
12. If the total amount interest earned after 2 years at the rate of 12%per annual is Rs.228.96, then the principal amount is
- A. 1,200
 - B. 1,100
 - C. 1,000
 - D. 900

13. 1, 2, 5, 12, 27, 58, 121 ?
A. 246
B. 247
C. 248
D. 249
14. If Raja paid total amount of Rs.324.48 after 2 years with compound interest at 4% per annum, then the principal amounts taken by Raja must be
A. Rs.300
B. Rs.320
C. Rs.310
D. Rs.316
15. 3, 8, 15, 24, ?, 48, 63
A. 30
B. 32
C. 35
D. 36
16. A certain company employed 600 men and 400 women and the average wage was 2.55 per hour. If a woman got 50 paise less than a man, what were their wages per hour?
A. Man Rs.3.00, Woman Rs. 2.50
B. Man Rs.3.50, Woman Rs. 3.00
C. Man Rs.2.75, Woman Rs. 2.25
D. Man Rs.3.25, Woman Rs. 2.75
17. 5, 14, 41, 86, ?
A. 149
B. 123
C. 157
D. 131
18. Nominal rate of compound interest is 6% per annum paid half yearly. Find effective rate of interest :
A. Rs. 6.09%
B. Rs. 6.08%
C. Rs. 6.07%
D. Rs. 6.06%
19. What sum lent at 5% per annum compound interest will amount to Rs. 441 in 2 years?
A. Rs. 390
B. Rs. 395
C. Rs.400
D. Rs.405
20. A piece of work which could be finished in 9 days was finished 3 days earlier after 10 more men joined. The number of men employed was
A. 18
B. 20
C. 22
D. 24

21. P can run one kilometre in half a minute less time than Q. In a kilometre race, Q gets a start of 100 m and still losses by 100 m. Find the time P and Q take to run a kilometre.
- A. 3 min , 2 min
 - B. 3 ½ min , 2 min
 - C. 2 min , 2 ½ min
 - D. 2 ½ min, 4 min
22. Vijay rows 3 km per hour in still water. If the river is running at 1 km per hour, it takes him 45minutes to row to a place and back .How far is the place ?
- A. 2 km
 - B. 1.5 km
 - C. 1 km
 - D. 2.5 km
23. It is 200 miles from place A to place B. If a bus takes 2 hours to travel the first 75 miles, how long must the bus take to travel the final 125 miles in order to have an average of 50 miles per hour for the entire trip ?
- A. 60 minutes
 - B. 94 minutes
 - C. 120 minutes
 - D. 110 minutes
24. What sum of money will become Rs.1352 in 2 years at 4 percent per annual compound interest? .
- A. Rs. 1200
 - B. Rs.1225
 - C. Rs. 1250
 - D. Rs.1300
25. If a man cycles at 10 km/hr, then he arrives at a certain place at 1 p.m. If he cycles at 15km/hr, he will arrive at the same place at 11 am. At what speed must he cycles to get there at noon ?
- A. 11 km/hr
 - B. 12 km/hr
 - C. 13 km/hr
 - D. 14 km/hr
26. How many languages and dialects are spoken by people all over the world?
- A. 6,000
 - B. 9,000
 - C. 4,000
 - D. 1,000
27. The oldest Indian language is:
- A. Telugu
 - B. Hindu
 - C. Tamil
 - D. Punjabi

28. What is the size and weight of "The largest book named - *The Super Book*?"
- A. 270 cm, 300 cm, 252 kg.
 - B. 100 cm, 110 cm, 100 kg.
 - C. 200 cm, 100 cm, 60 kg.
 - D. None of these
29. Who is the author of the book "*Time machine*" ?
- A. Lewis Carroll
 - B. Robert Louis Stevenson
 - C. Charles Lamb
 - D. H.G. Wells
30. Who developed the small pox vaccination?
- A. Eduard Jenner
 - B. Alexander Fleming
 - C. Albert Einstein
 - D. None of these
31. Who were the first to journey into space?
- A. Maj. Yori Gagarin and Maj. Gherman Titor from Russia
 - B. Comm. Grissom and Col John Glenn from America
 - C. Both are correct
 - D. None of these
32. Where is the Vallabhbhai Patel stadium located?
- A. Kolkata
 - B. Mumbai
 - C. Chennai
 - D. Delhi
33. 'National Science Day' is celebrated on
- A. 11th May
 - B. 1st January
 - C. 28th February
 - D. 15th May
34. Where is the biggest desert on earth?
- A. Siberia
 - B. Antarctica
 - C. Africa
 - D. California
35. The highest mountain of the world is in which two countries?
- A. India and Pakistan
 - B. Tibet and Nepal
 - C. China and Tibet
 - D. Pakistan and Nepal

36. Which capital city in the world is at the highest **altitude**?
- A. Bern, Switzerland
 - B. La Paz, Bolivia
 - C. Katmandu, Nepal
 - D. Ulaanbaatar, Mongolia
37. Name the Honorable Minister for Tamil Culture and Archaeology ministry
- A. K. Pandiarajan
 - B. Edappadi Palaniswamy
 - C. O. Pannerselvam
 - D. Dindigul Sreenivasan
38. The Indo-Chine Summit planned to be attended by Prime Minister Narendra Modi and Chinese President Xi Jinping scheduled in October 2019 takes place in:
- A. New Delhi
 - B. Chennai
 - C. Mamallapuram
 - D. Kanyakumari
39. Based on the recommendations of which committee, the Reserve Bank of India has announced to transfer Rs.1.76 lakh crore out of its surplus amount to the Government of India?
- A. C. Rangarajan Committee
 - B. Bimal Jalan Committee
 - C. Viral Acharya Committee
 - D. N.K. Singh Committee
40. Which product of Dindigul in Tamil Nadu was given GI tag in August 2019?
- A. Sarees
 - B. Locks
 - C. Toys
 - D. Prasadam
41. In which four states, One Nation One Ration Card scheme was launched in order to boost the National Food Security ?
- A. Arunachal Pradesh, Andhra Pradesh, Maharashtra and Gujarat
 - B. Telangana, Andhra Pradesh, Maharashtra and Gujarat
 - C. Telangana, Kerala, Maharashtra and Gujarat
 - D. Telangana, Kerala, Karnataka and Gujarat
42. Name the state, which has launched a special digitized policing system called "Automated Multi-modal Biometric Identification System (AMBIS)" to aid police investigations.
- A. Gujarat
 - B. Kerala
 - C. Maharashtra
 - D. Karnataka

43. Who will head the 4-member panel of ministers, which was created in 2018 to propose action against mob lynching?
- A. Narendra Singh Tomar
 - B. Amit Shah
 - C. Thaawar Chand Gehlot
 - D. Rajnath Singh
44. Where was the Money Museum of Reserve Bank of India (RBI) opened in order to improve the people's knowledge of the banking system?
- A. Chennai, Tamil Nadu
 - B. Mumbai, Maharashtra
 - C. New Delhi, Delhi
 - D. Kolkata, West Bengal
45. Name the mobile app launched by Minister for Earth Science, Science and Technology Dr. Harsh Vardhan to help farmers.
- A. Help Farmers
 - B. Land man
 - C. Agriculture
 - D. Meghdoot
46. How many years of jail term is rewarded to person, who indulge in pornography using child as per the Protection of Children from Sexual Offences (POCSO) (Amendment) Bill, 2019?
- A. Life imprisonment
 - B. 15 years
 - C. 5 years
 - D. 10 years
47. Which country has conferred "The National Order of Merit", its highest award to President Ram Nath Kovind?
- A. Ghana
 - B. Guinea
 - C. Gambia
 - D. Benin
48. What is the revised number of judges in the Supreme Court (SC) including Chief Justice of India (CJI) as per the Supreme Court (Number of Judges) Amendment Bill 2019?
- A. 31
 - B. 32
 - C. 33
 - D. 34
49. Name the former External Affairs Minister, youngest-ever Cabinet Minister & first woman Chief Minister of Delhi, who passed away recently.
- A. Padmaja Naidu
 - B. Sharada Mukherjee
 - C. Kumudben Joshi
 - D. Sushma Swaraj

50. Which government body will become paperless from the next session?
- Lok Sabha
 - Rajya Sabha
 - Election Commission of India
 - Both 1 & 2
51. A number of students are standing in a row facing north in such a way that a particular student is nineteenth from both the ends. So find the number of students in the class.
- 36
 - 37
 - 38
 - 39
52. A is shorter than B but taller than C. D is taller than A. E is shorter than C. Who amongst the following is the tallest?
- A
 - B
 - D
 - Either B or D
53. In a class of 75 students, the number of girls are twice the number of boys, Pankaj ranked 19th from the top. If there are 10 girls ahead of Pankaj, then the number of boys after him in rank are:
- 15
 - 16
 - 17
 - 18
54. A person starts from a point and goes 6 km in north direction. Now he takes a right turn and moves 7 km. Next he takes a left turn and moves 10 km. Next he turns right and moves 5 km. Finally he turns right and moves 12 km to reach his destination. Find the distance from his starting point.
- 12 km
 - $4\sqrt{10}$ km
 - $5\sqrt{5}$ km
 - $6\sqrt{2}$ km
55. A stenographer is tasked with typing a certain letter. How many words long is the letter?
- It will take two minutes less time to type the letter at an average speed of 80 words per minute than at an average speed of 60 words per minute.
 - It will take 6 minutes to type the first half of the letter at an average speed of 40 words per minute.
- Select the most appropriate answer from the following:
- Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient to answer the question asked
 - Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient to answer the question asked
 - BOTH statements (1) and (2) TOGETHER are sufficient to answer the question asked, but NEITHER statement ALONE is sufficient
 - EACH statement ALONE is sufficient to answer the question asked
 - Statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data are needed.

56. If $x = y^2$, what is the value of $y - x$?

- (1) $x = 4$
- (2) $x + y = 2$

Select the most appropriate answer from the following:

- A. Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient to answer the question asked
- B. Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient to answer the question asked
- C. BOTH statements (1) and (2) TOGETHER are sufficient to answer the question asked, but NEITHER statement ALONE is sufficient
- D. EACH statement ALONE is sufficient to answer the question asked
- E. Statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data are needed.

57. If the two floors in a certain building are 9 feet apart, how many steps are there in a set of stairs that extends from the first floor to the second floor of the building?

- (1) Each step is . foot high.
- (2) Each step is 1 foot wide.

Select the most appropriate answer from the following:

- A. Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient to answer the question asked
- B. Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient to answer the question asked
- C. BOTH statements (1) and (2) TOGETHER are sufficient to answer the question asked, but NEITHER statement ALONE is sufficient
- D. EACH statement ALONE is sufficient to answer the question asked
- E. Statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data are needed.

58. If y is an odd integer and the product of x and y equals 222, what is the value of x ?

- (1) x is a prime number.
- (2) y is a 3 digit number.

Select the most appropriate answer from the following:

- A. Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient to answer the question asked
- B. Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient to answer the question asked
- C. BOTH statements (1) and (2) TOGETHER are sufficient to answer the question asked, but NEITHER statement ALONE is sufficient
- D. EACH statement ALONE is sufficient to answer the question asked
- E. Statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data are needed.

59. Selection any of the options A to E, based on the following statements and conclusions:

Statements:

- a. Some pants are shirts.
- b. No face is a pant.
- c. No pant is a flower.

Conclusions:

- I. No flower is a face.
 - II. No face is a flower.
 - III. Some shirts are not faces.
 - IV. Some shirts are pants.
- A. Only I and II follow
 - B. Only III and IV follow
 - C. Either I or II follows
 - D. Only IV follows
 - E. None of these

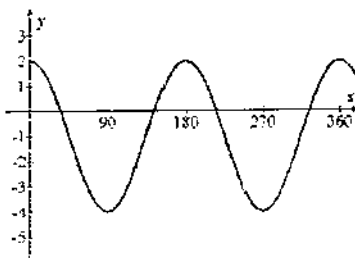
60. Answer question on the basis of the information below.

According to last week's newspaper, doctors in large cities make more money than doctors in small towns or rural areas. It does not seem fair that just because a doctor's office is in a fancy building or at a fancy address, he or she can charge the patients more. Of course, some medical schools cost more than others, but basically all doctors spend a lot of money and a long time in school. There's no proof that graduates of the more expensive schools practice in big cities and graduates of the less expensive schools practice in small towns. All doctors should charge the same. Whether a patient goes to a doctor in a big city or small town, the cost should be the same.

A person seeking to refute the argument might argue that

- A. all doctors charge too much money and should lower their fees.
- B. medical practices are more expensive to maintain in large cities than in small towns and rural areas.
- C. doctors who owe student loans should charge more than other doctors.
- D. medical care from small-town doctors is better than medical care from large-city doctors.
- E. certain medical specialists should charge more than others.

61. The diagram shows a graph of the form $y = a \cos (bx) + c$.



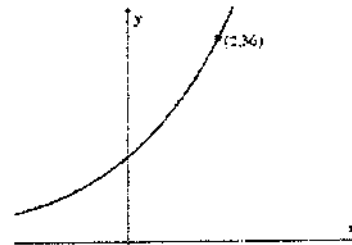
The equation of this graph is

- A. $y = 3 \cos x - 1$
- B. $y = 3 \cos 2x - 1$
- C. $y = 2 \cos 2x - 2$
- D. $y = 6 \cos 2x - 4$

62. A curve has equation $y = 2x^2 - 8x$. The gradient of this curve at the point P is 4.
The coordinates of P are
- (3, 6)
 - (3, -6)
 - (4, 0)
 - (-1, 10)

63. The diagram shows part of the graph of $y = 4k^x$.
The value of k is

- 3
- 2
- 9
- 18



64. Here are two statements about the points P(1, -2) and Q(7, 6).
(i) The length of PQ is 10 units
(ii) The gradient of PQ is $\frac{3}{4}$

Which of the following is true

- Neither statement is true
- Only statement (i) is true
- Only statement (ii) is true
- Both statements are true

65. What is the derivative of $(3x - 5)^4$
- $4(3x - 5)^3$
 - $12(3x - 5)^3$
 - $(3x - 5)^5 \div 5$
 - $(3x - 5)^5 \div 15$

66. The capacitance of a parallel-plate capacitor is:
- proportional to the plate area
 - proportional to the charge stored
 - independent of any material inserted between the plates
 - proportional to the potential difference of the plates
 - proportional to the plate separation

67. The capacitance of a parallel-plate capacitor can be increased by:
- increasing the charge
 - decreasing the charge
 - increasing the plate separation
 - decreasing the plate separation
 - decreasing the plate area

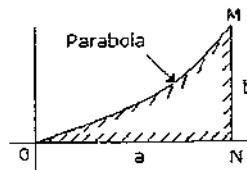
68. The impedance of an RLC series circuit is definitely increased if:
- C decreases
 - L increases
 - L decreases
 - R increases
 - R decreases

69. The mass of an electron:
- A. is almost the same as that of a neutron
 - B. is negative
 - C. equals that of a proton
 - D. is zero if the electron is at rest
 - E. is much less than that of a proton
70. An object moves in a circle at constant speed. The work done by the centripetal force is zero because:
- A. the displacement for each revolution is zero
 - B. the average force for each revolution is zero
 - C. there is no friction
 - D. the magnitude of the acceleration is zero
 - E. the centripetal force is perpendicular to the velocity
71. Germanium is an example of _____.
- A. an intrinsic semiconductor
 - B. a n-type semiconductor
 - C. a p-type semiconductor
 - D. insulator
72. Which of the following statement is TRUE?
- A. Solid changes into liquid on heating to its melting point.
 - B. Liquid changes into gas, on cooling to its freezing point.
 - C. Liquid changes into solid, on heating to its boiling point.
 - D. Solid changes into gas, on heating to its melting point.
73. Graphite, diamond and fullerene are the polymorphic forms of _____.
- A. sulphur
 - B. carbon
 - C. calcium carbonate
 - D. silicon dioxide
74. The space between the outermost filled energy band and the next empty band is called _____.
- A. valence band
 - B. conduction band
 - C. forbidden zone
 - D. none of these
75. The existence of a substance in more than one solid modifications is known as _____.
- A. polymorphism
 - B. isomorphism
 - C. anisotropy
 - D. enantiomorphism
76. _____ is used to draw curves which are not circular.
- A. Compass
 - B. Protractor
 - C. French curves
 - D. Pro circle

77. The angle which we can't make using both the Set-squares is _____
- A. 15°
 - B. 105°
 - C. 165°
 - D. 125°
78. The areas of the two subsequent sizes of drawing sheet are in the ratio _____.
- A. 1:5
 - B. 1:4
 - C. 1:2
 - D. 1:10
79. The cardboard scales are available in a set of _____ scales.
- A. six
 - B. ten
 - C. eight
 - D. twelve
80. Which is not the use of divider?
- A. To divide curved or straight lines into the desired number of equal parts
 - B. To draw circles
 - C. to transfer dimensions from one part of the drawing to another part
 - D. To set-off given distances from the scale to the drawing
81. The following is in unstable equilibrium
- A. A uniform solid cone resting on a generator on a smooth horizontal plane
 - B. A uniform solid cone resting on its base on a horizontal plane
 - C. A solid cube resting on one edge
 - D. A satellite encircling the earth
82. The time period of a simple pendulum depends on
- (i) Mass of suspended particle
 - (ii) Length of the pendulum
 - (iii) Acceleration due to gravity
- The correct answer is
- A) Only (i)
 - B) Both (ii) and (iii)
 - C) Both (i) and (iii)
 - D) All are correct
83. Free body diagram is an
- A. Isolated joint with only body forces acting on it
 - B. Isolated joint with internal forces acting on it
 - C. Isolated joint with all the forces, internal as well as external, acting on it
 - D. None of the above
84. The graphical method of determining the forces in the members of a truss is based on
- A. Method of joint
 - B. Method of section
 - C. Either method
 - D. None of the two methods

85. The C.G. of the shaded area of the bellow figure from the x-axis is

- A. $a/4$
- B. $3a/4$
- C. $3b/10$
- D. $3a/10$



86. Slump test for concrete is carried out, to determine

- A. Strength
- B. Durability
- C. Workability
- D. Water content

87. The rocks formed from molten magma, are called

- A. Sedimentary rocks
- B. Igneous rocks
- C. Metamorphic rocks
- D. None of these

88. Based on its dry weight, a freshly felled tree may contain water content upto

- A. 25 %
- B. 50 %
- C. 75 %
- D. 100 %

89. In stone masonry, stones (stratified rocks) are so placed that the direction of pressure to the plane of bedding is

- A. Right angles
- B. 45°
- C. 60°
- D. Parallel

90. German silver is an alloy of

- A. Zinc, lead and nickel
- B. Silver, gold and lead
- C. Copper, nickel and zinc
- D. Copper, brass and zinc

91. For a tacheometer, the additive and multiplying constants are respectively

- A. 0 and 100
- B. 100 and 0
- C. 0 and 0
- D. 100 and 100

92. After fixing the plane table to the tripod, the main operations which are needed at each plane table station are:

- i) levelling
- ii) orientation
- iii) centering

The correct sequence of these operations is

- A. (i), (ii), (iii)
- B. (i), (iii), (ii)
- C. (iii), (i), (ii)
- D. (ii), (iii), (i)
- E. None of the above

93. Select the correct statement.
- A. Contour interval on any map is kept constant.
 - B. Direct method of contouring is cheaper than indirect method.
 - C. Inter-visibility of points on a contour map cannot be ascertained.
 - D. Slope of a hill cannot be determined with the help of contours.
94. Benchmark is established by
- A. hypsometry
 - B. barometric levelling
 - C. spirit levelling
 - D. trigonometrical levelling
95. A series of closely spaced contour lines represents a/an
- A. steep slope
 - B. gentle slope
 - C. uniform slope
 - D. plane surface
96. Which among the following is not a principle of planning?
- A. Furniture requirements
 - B. Aspect
 - C. Prospect
 - D. Respect
97. The Low income housing construction funding is provided by _____
- A. National Governments
 - B. State Governments
 - C. World Bank
 - D. National Governments, State Governments and World Bank
98. The building construction industry relies on sets of _____ drawings to construct homes and commercial buildings.
- A. mechanical
 - B. isometric
 - C. architectural working
 - D. all of the above
99. The architectural drafter usually begins a set of working drawings by creating the _____ plan first
- A. foundation
 - B. floor plan
 - C. elevations
 - D. building section
100. The foundation contractor will work with the following architectural plans.
- A. foundation
 - B. site plan
 - C. floor plan
 - D. all of the above

101. When a body is placed over a liquid, it will sink down if
- A. Gravitational force is equal to the up-thrust of the liquid
 - B. Gravitational force is less than the up-thrust of the liquid
 - C. Gravitational force is more than the up-thrust of the liquid
 - D. None of the above
102. Bernoulli equation deals with the law of conservation of
- A. Mass
 - B. Momentum
 - C. Energy
 - D. Work
103. The velocity of jet of water traveling out of opening in a tank filled with water is proportional to { W- width of tank , T- time taken to open the tank, h - head of water }
- A. h
 - B. h^2
 - C. W/T
 - D. $h/2$
104. Ratio of inertia force to elastic force is known as
- A. Mach number
 - B. Froude number
 - C. Reynolds number
 - D. Weber's number
105. The mercury does not wet the glass. This is due to the property of the liquid known as
- A. Cohesion
 - B. Adhesion
 - C. Viscosity
 - D. Surface tension
106. Bulk weight of soil is the ratio of
- A. weight of soil mass to its total volume
 - B. weight of soil solid to its volume of solids
 - C. weight of soil solid to its total volume
 - D. weight of soil solid to volume of solids
107. Which of the following is highly permeable?
- A. Clay
 - B. Fine sand
 - C. Coarse sand
 - D. Gravel
108. Sight distance at intersection should be equal to
- A. enabling the approaching vehicle to change speed
 - B. enabling approaching vehicle to stop
 - C. enabling the stopped vehicle to cross a main road
 - D. highest the value of (a), (b) and (c)

109. Transition curves are required to
- enable driver to turn steering gradually
 - enable gradual introduction of super-elevation
 - improve aesthetic appearance of the road
 - all the above
110. If sufficient expansion joint gap is not provided or the joint is very tight the rail may _____.
- tilt
 - hogg
 - develop corrugation
 - buckle
111. Correction for refraction is approximately
- $+\frac{1}{5}$ th of curvature correction
 - $-\frac{1}{5}$ th of curvature correction
 - $+\frac{1}{7}$ th of curvature correction
 - $-\frac{1}{7}$ th of curvature correction
112. Sensitivity of a bubble tube can be increased by
- increasing the length of the tube
 - increasing the diameter of the tube
 - decreasing viscosity of liquid
 - any of the above
113. In a tachemetry, if intercept taken on a vertically held staff is inclined at an angle 'q' to horizontal, the horizontal distance is
- $k S + C$
 - $k S \cos q + C \cos q$
 - $k S \cos^2 q + C \cos q$
 - $k S \sin^2 q + C \sin q$
114. Two theodolite method of setting out a curve involves
- linear measurements only
 - angular measurements only
 - both angular and linear measurement
 - none of the above
115. In the tachemetry, if inclined sight q is taken on a staff held normal to the sight, horizontal distance is
- $(k S + C) \cos q + r \sin q$
 - $(k S + C) \sin q$
 - $(k S + C) \cos q \sin q + r \sin 2 q$
 - $(k S + C) \tan q$

116. Select the correct matching from options A, B, C & D

List - I

List - II

Type of beam connection		Connecting members used	
a.	Framed connection	1.	Flange cleats only
b.	Unstiffened seated connection	2.	Flange and web clips
c.	Stiffened seated connection	3.	Web cleat only
d.	Rigid connection	4.	Flanged cleats and stiffener angle

Options :

- | | | | | |
|----|-------|-------|-------|-------|
| A. | a - 3 | b - 2 | c - 1 | d - 4 |
| B. | a - 4 | b - 1 | c - 2 | d - 4 |
| C. | a - 4 | b - 3 | c - 2 | d - 1 |
| D. | a - 3 | b - 1 | c - 4 | d - 2 |

117. In the design of gantry girders, impact factor for vertical loads for electrically operated crane is taken as

- A. 10%
- B. 15%
- C. 20%
- D. 25%

118. If standard deviation is 4 N/mm^2 , the mean strength of M 20 concrete should be

- A. 16 N/mm^2
- B. 20 N/mm^2
- C. 24 N/mm^2
- D. 26.4 N/mm^2

119. In a beam and slab structure, if width of beam is b_w , depth of slab D_f , l_o is the distance between points of zero moments in the beam, effective width of intermediate flange is given by

- A. $b_f = l_o/6 + b_w + 6 D_f$
- B. $b_f = l_o/3 + b_w + 6 D_f$
- C. $b_f = l_o/6 + b_w + 3 D_f$
- D. $b_f = l_o/3 + b_w + 3 D_f$

120. Water tanks should be designed by

- A. working stress method
- B. ultimate load method
- C. limit state method
- D. any of the above
- E. None of the above

121. Which one of the following is not a formula for determining velocity of flow in sewers

- A. Fanning's formula
- B. Manning's formula
- C. Chezy's formula
- D. Hazen-William's formula

122. Match List- I with List- II selecting the answer codes given below :

Name of formula for estimating water demand for fire			
List - I		List - II	
a.	Kuching's formula	1.	$Q = 4637 \sqrt{P+1} - 0.01 \sqrt{P}$
b.	Buston's formula	2.	$Q = 1136 (P/5 + 10)$
c.	Freeman's formula	3.	$Q = 3182 \sqrt{P}$
d.	National Board of Fire Underwriter's formula	4.	$Q = 5663 \sqrt{P}$

where Q is quantity in litres/ minute P is population in thousands

Codes:

- A. a-4 b-3 c-1 d-2
 B. a-4 b-2 c-3 d-1
 C. a-3 b-4 c-1 d-2
 D. a-3 b-4 c-2 d-1

Select your answer according to the coding system given for the Assertion and Reason given in question nos. 123 & 124:

coding system:

- A. Both **Assertion** and **Reason** are true and **Reason** is the correct explanation of **Assertion**.
 B. Both **Assertion** and **Reason** are true but **Reason** is not the correct explanation of **Assertion**.
 C. **Assertion** is true but **Reason** is false.
 D. **Assertion** is false but **Reason** is true.

123. **Assertion:** Darcy's law is not applicable in the immediate vicinity of the well.
Reason: In the immediate vicinity of the wells, hydraulic gradient is steep.
124. **Assertion:** All the hydraulic formulae can be directly used in the design of sewage system and the treatment plants in water carriage system.
Reason: In water carriage system, water contains high percentage of solid matter.
125. Low turbidity of water can be determined by
 A. Turbidity rod
 B. Jackson's turbidometer
 C. Baylis turbidometer
 D. Hellipe turbidometer
126. In the time-cost optimisation, using CPM method for network analysis, the crashing of the activities along the critical path is done starting with the activity having
 A. longest duration
 B. highest cost slope
 C. least cost slope
 D. shortest duration
127. Which of the following is not a PERT event ?
 A. site investigation started
 B. concreting work completed
 C. bus starts from Jaipur
 D. class is being attended

128. Select the incorrect statement.
- Earliest start of an activity is the early event time of the node it leaves.
 - Latest finish of an activity is the late event time of the node it enters
 - Latest start of an activity is its latest finish minus its duration.
 - none of the above
129. A father notes that when his teenage daughter uses the telephone, she takes not less than 6 minutes for a call and sometimes as much as an hour. Fifteen minutes call are more frequent than calls of any other duration. If these phone calls were an activity in PERT project, then phone call's expected duration will be
- 15 minutes
 - 20.143 minutes
 - 21 minutes
 - 27 minutes

130. Free float for any activity is defined as the difference between
- its earliest finish time and earliest start time for its successor activity
 - its latest start time and earliest start time
 - its latest finish time and earliest start time for its successor activity
 - its earliest finish time and latest start time for its successor activity

131. *Select your answer according to the coding system given for the **Assertion** and **Reason** given below:*

Assertion : Shape factor is defined as the ratio of plastic moment capacity of the section to yield moment capacity of the section

Reason : The shape factor is the property of the section and it will not depend upon the property of the material.

- Both **Assertion** and **Reason** are true and **Reason** is the correct explanation of **Assertion**.
- Both **Assertion** and **Reason** are true but **Reason** is not the correct explanation of **Assertion**.
- Assertion** is true but **Reason** is false.
- Assertion** is false but **Reason** is true.

132. In a two-hinged semicircular arch of radius R , when subjected to a central concentrated load W , the horizontal thrust developed is

- $W/2$
- $W/4$
- $3WR/4\pi$
- w/π

133. In a fixed beam of span L subject to uniformly distributed load (udl) ' w ' per unit length, moment at mid-span is

- $\frac{wl^2}{8}$
- $\frac{wl^2}{12}$
- $\frac{wl^2}{24}$
- $\frac{wL^2}{48}$

134. A propped cantilever of span L is fixed at end A and simply supported at end B . It is subjected to udl of intensity w per unit length. Then the reactions at A and B are

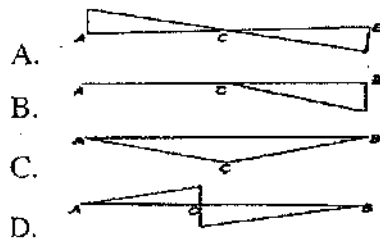
A. $R_A = \frac{5}{8} wL, R_B = \frac{3}{8} wL$

B. $R_A = R_B = \frac{wL}{2}$

C. $R_A = \frac{3}{8} wL, R_B = \frac{5}{8} wL$

D. $R_A = \frac{wL}{4}, R_B = \frac{3wL}{4}$

135. Influence line diagram for bending moment at a point C in a cantilever with fixed end at A and free at end B is



136. _____ are set of rules and procedures to control the data transmission over the internet

- A. IP address
- B. Domains
- C. Protocol
- D. Gateway

137. A computer program that converts an entire program into machine language is called a/an

- A. Interpreter
- B. Simulator
- C. Compiler
- D. Commander

138. Which one of the following is NOT a computer language

- A. MS-Excel
- B. BASIC
- C. COBOL
- D. C++

139. Which of the following does not store data permanently?

- A. ROM
- B. RAM
- C. Floppy Disk
- D. Hard Disk

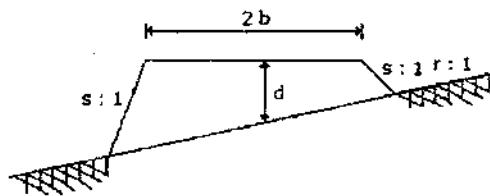
140. _____ refers to electronic trespassing or criminal hacking.

- A. Cracking
- B. Jacking
- C. Spoofing
- D. Smarming

141. The correct prismoidal formula for volume is with usual notation

- A. $\frac{D}{3}$ [first area + last area + \sum Even area + 2 \sum odd areas]
- B. $\frac{D}{3}$ [first area + last area + 4 \sum Even area + 2 \sum odd areas]
- C. $\frac{D}{3}$ [first area + last area + 2 \sum Even area + 4 \sum odd areas]
- D. $\frac{D}{6}$ [first area + last area + 2 \sum Even area + 4 \sum odd areas].

142. The area of the cross-section of a road fully in bank as shown in the given figure, is



- A. $\frac{sb^2 + r^2 (2bd + Sd)^2}{r^2 \cdot s^2}$
- B. $\frac{sb^2 + r^2 (2bd + Sd)^2}{r^2 \cdot s^3}$
- C. $\frac{sb^2 + r^2 (2bd + Sd)^2}{r \cdot s}$
- D. None of these

143. Estimate expected to be least accurate is

- A. Supplementary estimate
- B. Plinth area estimate
- C. Detailed estimate
- D. Revised estimate

144. A company purchased a vehicle for \$ 6000. It will be used for 5 years and its residual value is expected to be \$ 1000. What is the annual amount of depreciation using straight line method of depreciation?

- A. \$ 1000
- B. \$ 2000
- C. \$ 3000
- D. \$ 3300

145. According to Indian Standards Institution (ISI/ BIS), the actual size of modular bricks is

- A. 23 cm × 11.5 cm × 7.5 cm
- B. 25 cm × 13 cm × 7.5 cm
- C. 19 cm × 9 cm × 9 cm
- D. 20 cm × 10 cm × 10 cm

146. Two trains running in opposite directions cross a man standing on the platform in 27 seconds and 17 seconds respectively and they cross each other in 23 seconds. The ratio of their speeds is:
- A. 1 : 3
 - B. 3 : 2
 - C. 3 : 4
 - D. None of these
147. A train running at the speed of 60 km/ hr crosses a pole in 9 seconds. What is the length of the train?
- A. 120 metres
 - B. 180 metres
 - C. 324 metres
 - D. 150 metres
148. How many seconds will a 500 metre long train take to cross a man walking with a speed of 3 km/hr in the direction of the moving train, if the speed of the train is 63 km/hr?
- A. 25
 - B. 30
 - C. 40
 - D. 45
149. Two goods trains each 500 m long, are running in opposite directions on parallel tracks. Their speeds are 45 km/hr and 30 km/hr respectively. Find the time taken by the slower train to pass the driver of the faster one.
- A. 12 sec.
 - B. 24 sec.
 - C. 48 sec.
 - D. 60 sec
150. Two trains are running in opposite directions with the same speed. If the length of each train is 120 metres and they cross each other in 12 seconds, then the speed of each train (in km/hr) is:
- A. 10
 - B. 18
 - C. 36
 - D. 72



Compassionate Grounds - Suitability Test for Junior Engineer
in Engineering Department in Level 6 in 7th PC

DATE: 13/10/2018

Max: 150 Marks

TIME: 2 Hours

INSTRUCTIONS

1. Question paper contains 150 objective type questions only with multiple choice.
2. All answers to be written on the answer sheets provided for the purpose.
3. Nothing should be written on the question paper.
4. For the answer to objective questions, no corrections of any type should be made
If any corrections are made, such answer will not be valued
5. Each question carries equal marks.

150 x 1=150 Mark

1. Which of the following is the oldest monument?
(a) Qutub Minar
(b) Ajanta Caves
(c) Taj Mahal
(d) Khajuraho
2. Which of the following 'Veda' deals with medicine?
(a) Atharva Veda
(b) Yajur Veda
(c) Sama Veda
(d) Rig Veda
3. Which, among the following, is the oldest dynasty?
(a) Maurya
(b) Gupta
(c) Vardhana
(d) Kushan
4. The Indus Valley Civilisation reached its zenith in _____ BC.
(a) 3500
(b) 2500
(c) 1700
(d) 500
5. Original name of Lord Buddha was
(a) Vardhamana
(b) Sidhartha
(c) Kumara
(d) Bhodrabehe
6. The famous Brihadcswara Temple in Tanjore was built by
(a) Pallavas
(b) Cholas
(c) Pandyas
(d) Chalukyas
7. Which of the following is correctly matched?
(a) Golden Temple – Patiala
(b) Iron Pillar - Agra
(c) Qutab Minar – Mathura
(d) Humayun's Tomb - Delhi

8. The guerilla warfare was pioneered by
 (a) Aurangzeb
 (b) Akbar
 (c) Shivaji
 (d) Balaji Rao
9. Who said, "Ram and Rahim are the two different names of the same God?"
 (a) Kabir
 (b) Ramdas
 (c) Chatianaya
 (d) Ramanuja
10. Akbar's religious policy was characterized by
 (a) Tolerance towards all religions
 (b) An indifference to religions
 (c) A hostile attitude towards other religious communities
 (d) Belief in secularism
11. Match List-I with List-II and select the correct answer from the codes given below the lists

List-I (Forms of Government)

- A. Presidential system
 B. Parliamentary system
 C. Federal System
 D. Unitary System

List-II (Principles)

1. Separation of powers
 2. Close relationship between executive and legislature
 3. Concentration
 4. Division of power

Code	A	B	C	D
(a)	1	2	3	4
(b)	2	1	3	4
(c)	2	1	4	3
(d)	1	2	4	3

12. As we all know child labour is totally banned in India (Article – 24) as per the child means as person who has not completed –
 (a) 14 years of his/her age
 (b) 18 years of his/her age
 (c) 20 years of his/her age
 (d) 21 years of his/her age
13. Which article of the Indian constitution for the institution of Panchayati Raj?
 (a) Article 36
 (b) Article 39
 (c) Article 40
 (d) Article 48
14. Which part of the Indian Constitution deals with Fundamental Rights?
 (a) Part-I
 (b) Part-II
 (c) Part-III
 (d) Part-IV

15. Match List-I (Parts of the Indian Constitution) with List-II (Provisions) and select the correct answer using the codes given below –

List-I

- A. Part IV A
B. Part VIII
C. Part IX
D. Part IX A

List-II

1. The Fundamental Duties
2. The Union Territories
3. The Panchayats
4. The Municipalities

Code	A	B	C	D
(a)	1	2	3	4
(b)	2	1	3	4
(c)	4	3	1	2
(d)	4	3	2	1

16. The speaker of Lok Sabha can resign his office by addressing his resignation to –
(a) The president
(b) The prime Minister
(c) The Deputy Speaker of the Lok Sabha
(d) The Chief Justice of India
17. What is zero Hour?
(a) When the proposals of the opposition are raised
(b) When matter of utmost importance are raised
(c) Interval between the morning and afternoon sessions
(d) When a money bill is introduced in Lok Sabha
18. Which Indian State had the first woman Chief Minister?
(a) U.P.
(b) Bihar
(c) Tamil Nadu
(d) Delhi
19. The first woman Governor of a state in free Indian was
(a) Mrs. Indira Gandhi
(b) Mrs. Vijaya Laxmi Pandit
(c) Mrs. Sarojini Naidu
(d) Mrs. Sucheta Kripalani
20. Who among the following holds office during the pleasure of the President?
(a) Governor of State
(b) Election Commissioner of India
(c) Chief Minister of State
(d) Prime Minister of India
21. Match List-I (Parts of the Indian Constitution) with List-II (Provisions) and select the correct answer using the codes given below –
- | List-I (Features of the Indian Constitution) | List-II (Borrowed from) |
|----------------------------------------------|-------------------------|
| I. Fundamental Rights | A. UK. |
| II. Parliamentary System of Government | B. USA |
| III. Emergency Provisions | C. Ireland |
| IV. Directive Principles of State Policy | D. German Reich. |
| | E. Canada |
- (a) I-B, II-D, III-E, IV-A
(b) I-E, II-A, III-D, IV-C
(c) I-B, II-A, III-D, IV-C
(d) I-A, II-B, III-D, IV-C

22. How many times has the Preamble of the Constitution of India been amended so far?
(a) Twice
(b) Thrice
(c) Once
(d) Never
23. Tamil Nadu Reservation Act providing 69% reservation has been placed in which Schedule of the Constitutions?
(a) Sixth
(b) Seventh
(c) Eighth
(d) Ninth
24. Which of the following is included in Article 19 (1) (a) of Constitution:
(a) Right to know
(b) Right to reply
(c) Right to science
(d) All of the above
25. "Right to property" has been taken away from Fundamental Rights a placed in Article 300A through:
(a) 24th amendment
(b) 42nd amendment
(c) 39th amendment
(d) 44th amendment
26. Find the remainder when 3^{27} is divided by 5 ?
(a) 3
(b) 2
(c) 4
(d) 1
27. What is the smallest number should be added to 5377 so that the sum is completely divisible by 7 ?
(a) 5
(b) 4
(c) 6
(d) 2
28. The difference of the cubes of two consecutive even integers is divisible by which of the following integers?
(a) 3
(b) 6
(c) 4
(d) 5
29. If the sum of 1st n integers is 55 then what is n ?
(a) 5
(b) 7
(c) 8
(d) 10
30. A 4 digit number 8a43 is added to another 4 digit number 3121 to give a 5 digit number 11b64, which is divisible by 112, then $(a+b) = ?$
(a) 3
(b) 4
(c) 7
(d) 5

31. The product of two numbers is 20. The sum of squares of the two numbers is 81. Find the sum of the numbers.
(a) 21
(b) 19
(c) 11
(d) 9
32. The sum of two numbers is 30. The difference between the two numbers is 20. Find the product of two numbers?
(a) 100
(b) 200
(c) 325
(d) 125
33. Which of the following is not a prime number?
(a) 73
(b) 53
(c) 113
(d) 133
34. $1596 \times 1598 = ?$
(a) 2553404
(b) 2553504
(c) 2553604
(d) 2553704
35. What is the least number that must be subtracted 2458 so that it becomes completely divisible by 13?
(a) 1
(b) 2
(c) 3
(d) 4
36. $(?) + 2763 + 1254 - 1967 = 26988$
(a) 24938
(b) 37474
(c) 27447
(d) 37447
37. The sum of first 75 natural numbers is:
(a) 1235
(b) 1250
(c) 2850
(d) 2250
38. If 18% of $\frac{5}{6}$ of a number of 54, then the number is
(a) 464
(b) 175
(c) 280
(d) 360
39. Which of the following is always odd?
(a) Sum of two odd numbers
(b) Diff. of two odd numbers
(c) Prod. of two odd numbers
(d) None of these

40. Find the number which is nearest to 457 and is exactly divisible by 11.
(a) 450
(b) 451
(c) 460
(d) 462
41. A wall construction can be done by 6 men and 5 women in 6 days or 3 men and 4 women in 10 days. It can be done by 9 men and 15 women in:
(a) 1 day
(b) 2 days
(c) 3 days
(d) 4 days
42. In a road construction, 12 women take 16 days to complete a work which can be completed by 8 men in 12 days. 16 men started working and after 3 days 10 men left and 4 women joined them. How many days will it take them to complete the remaining work?
(a) 6
(b) 4
(c) 3
(d) 8
43. If 10 boys or 18 girls can do a piece of work in 15 days, then 25 boys and 15 girls together will do twice the work in:
(a) 4 and half days
(b) 8 days
(c) 9 days
(d) 36 days
44. A certain number of men complete a piece of work in sixty days. If there were 8 men more, the work could be finished in 10 days less. How many men were originally there?
(a) 30
(b) 32
(c) 36
(d) 40
45. James can lay railway track between two given stations in 40 days and Johnny can do the same job in 20 days. With help of Paul they did the job in 5 days only. Then, Paul alone can do the job in:
(a) 6 days
(b) 7 days
(c) 8 days
(d) 8 and half days
46. A boy performs $\frac{3}{5}$ of the total journey by train, $\frac{7}{20}$ by bicycle and the remaining 6.5 km on foot. His total journey is:
(a) 125 km
(b) 130 km
(c) 135 km
(d) 140 km
47. Sound is said to travel in air at about 1100 feet per second. A man hears the axe striking the tree, $\frac{11}{5}$ seconds after he sees it strike the tree. How far is the man from the wood chopper?
(a) 2420 ft
(b) 2524 ft
(c) 2600 ft
(d) 2740 ft

48. Two trains starting at the same time from two stations 200 km apart and going in opposite directions cross each other at a distance of 110 km from one of the stations. What is the ratio of their speeds?
- 11:9
 - 11:20
 - 9:20
 - 11:8
49. A cyclist covers a distance of 750 meter in 2 minutes 30 seconds. What is the speed in km/hr of cyclist.
- 16 km/hr
 - 17 km/hr
 - 18 km/hr
 - 19 km/hr
50. A train covers a distance in 50 min, if it runs at a speed of 48 kmph on an average. The speed at which the train must run to reduce the time of journey to 40 min will be
- 45 kmph
 - 60 kmph
 - 75 kmph
 - None of the above

Directions for questions 51- 53 :

Below in each question are given two statements I and II. These statements may be either independent causes or may be effects of independent causes or a common cause. One of these statements may be the effect of the other statement. Read both the statements and decide which of the following answer choices correctly depicts the relationship between these two statements.

51. **Statements:**

- Railways has increased the number of trains between Bhopal and Chennai
 - Railways has increased the frequency of popular trains between Bhopal and Chennai
- If statement I is the cause and statement II is its effect.
 - If statement II is the cause and statement I is its effect.
 - If both the statements I and II are independent causes.
 - If both the statements I and II are effects of independent causes.
 - If both the statements I and II are effects of some common causes.

52. **Statements:**

- The meteorological department has issued a statement mentioning deficient rainfall during monsoon in many parts of the country.
 - The government has lowered the revised estimate GDP growth from the level of earlier estimates
- If statement I is the cause and statement II is its effect.
 - If statement II is the cause and statement I is its effect.
 - If both the statements I and II are independent causes.
 - If both the statements I and II are effects of independent causes.
 - If both the statements I and II are effects of some common causes.

53. **Statements:**
I. The university decided to postpone the final exams for course X by a month.
II. Nearly 25 students out of 60 students in course X failed to pass the final exams last year.
(a) If Statement I is the cause and statement II is its effect.
(b) If Statement II is the cause and statement I is its effect.
(c) If both the statements I and II are independent causes.
(d) If both the statements I and II are effects of independent causes.
(e) If both the statements I and II are effects of some common causes.

54. Which of the following can be a possible effect of the statement below?
Statement: The income tax authorities carried out raids at three different business houses in the City last week.
(a) The three business houses are regular defaulters in paying of their income tax
(b) The income tax department had received the tip off about the illegal activities going on in the three business houses.
(c) The government decided to look into the matter and has appointed an enquiry committee.
(d) Other business houses took immediate action to clear off all their Income Tax dues in order to avoid a raid on their establishments.
(e) The authorities intend to conduct raids in several other business houses in the vicinity.

Directions for questions 55 & 56:

A statement is followed by two courses of actions numbered I and II. A course of action is taken for improvement follow up at etc. Read the statement carefully and pick the correct answer choice.

55. **Statements:**
A mid air collision was narrowly avoided when the pilot of one of the aircrafts neglected the air traffic controller's instructions.
Courses of Action:
I. Pilots of both of the air crafts should be immediately reprimanded by revoking there licences
II. The training of Air traffic controllers should be improved and made more comprehensive in order to avoid such incidents in future.
(a) If only course of action I follows
(b) If only course of action II follows
(c) If either course of action I or II follows
(d) If neither course of action I nor II follows
(e) If both courses of action I and II follow

56. **Statements:**
Oil spill from the oil carrier of one of the biggest Oil Companies has really affected the marine life in a large area near the Gulf region.
Courses of Action:
I. The oil company should be penalized for the negligence and the harm caused to the environment.
II. Efforts should be made to shift as many Marine animals in the area as possible to safer habitats.
(a) If only course of action I follows
(b) If only course of action II follows
(c) If either course of action I or II follows
(d) If neither course of action I nor II follows
(e) If both courses of action I and II follow

57. **Directions:** A statement is given followed by three courses of action. A course of action is taken for improvement follow up at etc. Read the statement carefully and pick the correct answer choice.

Statements:

Tomorrow will be the first day of operation of metro Railways for general public. No doubt a large number of people will turn up tomorrow to enjoy the facility of metro Railways.

Courses of Action:

- I. Metro authorities should seek additional Police Force.
- II. Sightseers should be appealed to come only during non peak hours.
- III. All the windows for issuing tickets should be ready to issue tickets in entry of the people should be regulated to manageable limits.
 - (a) Only I and II follow
 - (b) Only II and III follow
 - (c) Only I and III follow
 - (d) All follow
 - (e) None of these

58. **Directions:** Some statements are given. And some conclusions are also given below them. Find the correct (set of) conclusion(s) that can be drawn from the statements.

Statements:

- A. Some garbages are money.
- B. All papers are garbages.
- C. All money are coins.

Conclusions:

- I. Some papers are coins.
- II. Some garbages are coins.
- III. No money is a paper.
- IV. All coins are garbages
 - (a) Only I follows
 - (b) Only I and III follows
 - (c) Only III follows
 - (d) Only II and III follow
 - (e) Only II follow

Directions (59-60): In each of the questions below are given four statements followed by four conclusions numbered I, II, III and IV. You have to take the given statements to be true even if they seem to be at variance from commonly known facts. Read all the conclusions and then decide which of the given conclusions logically follows from the given statements disregarding commonly known facts.

59. **Statements:** Some roads are buses. All buses are trains. Some trains are trucks. All trucks are kites.

Conclusions:

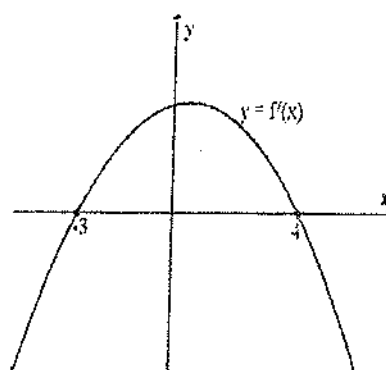
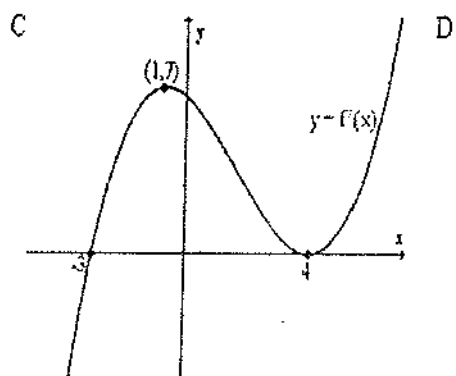
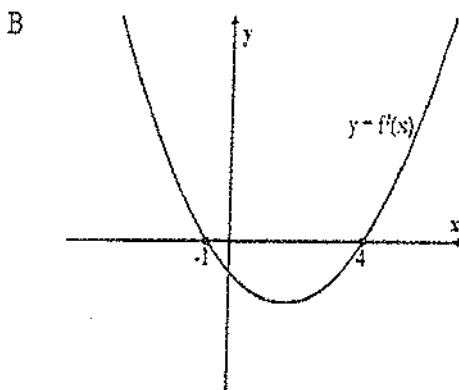
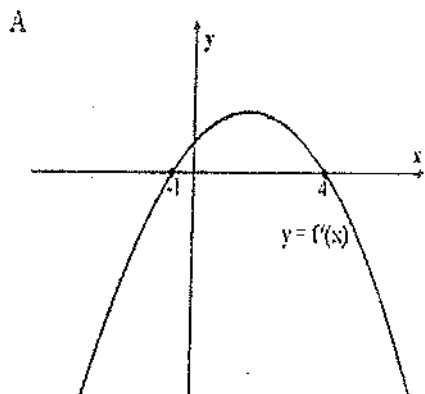
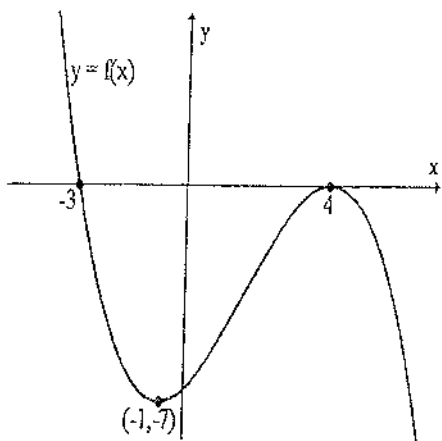
- | | |
|-----------------------------|----------------------------|
| I. Some trucks are roads. | II. Some kites are buses. |
| III. Some trains are roads. | IV. Some kites are trains. |
| (a) None follows | (b) Only I follows |
| (c) Only II follows | (d) Only III follows |
| (e) None of these | |

60. **Statements:** Some desks are fruits. All fruits are flowers. No flower is branch. Some branches are roots.

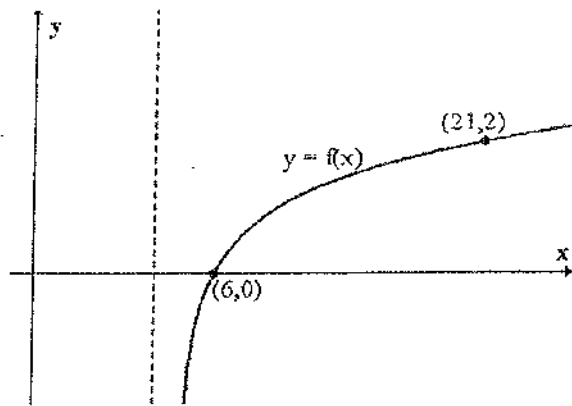
Conclusions:

- | | |
|-----------------------------------------|------------------------------|
| I. Some roots are flowers. | II. No desk is branch. |
| III. Some flowers are desks. | IV. Some branches are desks. |
| (a) Only either II or IV follows. | (b) Only III follows |
| (c) Both Either II or IV and III follow | (d) Both III and IV follow |
| (e) None of these | |

61. The diagram opposite shows the graph of $y = f(x)$. Which of the following could be the graph of $y = f'(x)$.

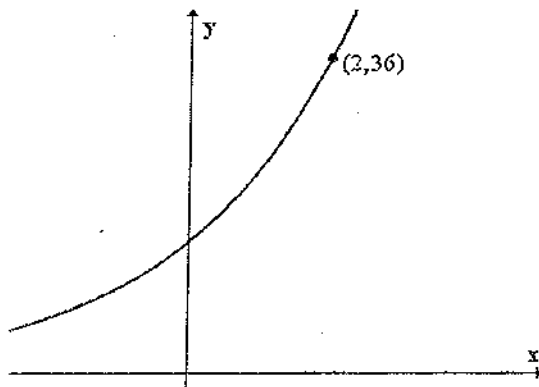


62. The diagram shows the graph of $y = f(x)$.



The equation of $f(x)$ is

- (a) $f(x) = \log_4 (x - 5)$
 - (b) $f(x) = \log_4 (x + 5)$
 - (c) $f(x) = \log_2 (x - 5)$
 - (d) $f(x) = \log_2 (x + 5)$
63. The diagram shows part of the graph of $y = 4k^x$.
The value of k is



- (a) 3
 - (b) 2
 - (c) 9
 - (d) 18
64. Here are two statements about the points $P(1, -2)$ and $Q(7, 6)$.
- (i) The length of PQ is 10 units
 - (ii) The gradient of PQ is $\frac{3}{4}$
- Which of the following is true
- (a) Neither statement is true
 - (b) Only statement (i) is true
 - (c) Only statement (ii) is true
 - (d) Both statements are true
65. A curve has equation $y = 3x^2 - 5x$. The gradient of this curve at the point $(-1, 8)$ is
- (a) 1
 - (b) -11
 - (c) -6
 - (d) 4

66. A nanosecond is:
- 10^9 s
 - 10^{-9} s
 - 10^{-10} s
 - 10^{-10} s
 - 10^{-12}
67. Which of the following is closest to a yard in length?
- 0.01m
 - 0.1m
 - 1m
 - 100m
 - 1000m
68. The SI standard of length is based on:
- the distance from the north pole to the equator along a meridian passing through Paris
 - wavelength of light emitted by Hg198
 - wavelength of light emitted by Kr86
 - a precision meter stick in Paris
 - the speed of light
69. A car starts from rest and goes down a slope with a constant acceleration of 5 m/s^2 . After 5 s the car reaches the bottom of the hill. Its speed at the bottom of the hill, in meters per second, is:
- 1
 - 12.5
 - 25
 - 50
 - 160
70. In 1866, the U. S. Congress defined the U. S. yard as exactly $3600/3937$ international meter. This was done primarily because:
- length can be measured more accurately in meters than in yards
 - the meter is more stable than the yard
 - C. this definition relates the common U. S. length units to a more widely used system
 - there are more wavelengths in a yard than in a meter
 - the members of this Congress were exceptionally intelligent
71. The gas is commonly used in anesthesia?
- Methane
 - Nitrous Oxide
 - Nitrogen
 - Hydrogen Peroxide
72. The atoms of the elements having the same mass number but different atomic number are called ?
- Isotopes
 - Isobars
 - Isotones
 - Isomers
73. Nucleons are ?
- Protons and Neutrons
 - Neutrons and Electrons
 - Protons and Electrons
 - Protons, Neutrons and Electrons

74. The maximum number of electrons on a principal shell is?
(a) n^2
(b) n
(c) $2n^2$
(d) $3n^2$
75. Which one of the following is used in making pencils?
(a) Charcoal
(b) Bone Black
(c) Black Ash
(d) Graphite
76. The maximum area of tension reinforcement in beams shall not exceed?
(a) 1.5%
(b) 4%
(c) 7%
(d) 0.5%
77. The diameter of longitudinal bars of a column should never be less than?
(a) 12 mm
(b) 6 mm
(c) 10 mm
(d) 8 mm
78. The number of treads in a flight (in a staircase) is equal to _____
(a) risers in the flight
(b) risers plus one
(c) risers minus one
(d) risers plus three
79. For initial estimate for a beam design, the width is assumed?
(a) $1/10^{\text{th}}$ of span
(b) $1/30^{\text{th}}$ of span
(c) $1/15^{\text{th}}$ of span
(d) $1/5^{\text{th}}$ of span
80. Design of R.C.C. simply supported beams carrying U.D.L. is based on the resultant B.M. at _____
(a) mid span
(b) supports
(c) every section
(d) quarter span
81. Free-body diagram means
(a) the diagram drawn with free hand
(b) the diagram of a body with applied forces
(c) the diagram of a body with applied forces, self-weight and reactions.
(b) the diagram of a freely suspended body.

82. If a body is in equilibrium under the action of three forces F_1 , F_2 and F_3 . α , β and γ are the angles between F_2 and F_3 , F_3 and F_1 , and F_1 and F_2 . Then according to Lami's theorem

(a) $\frac{F_1}{\sin \alpha} = \frac{F_2}{\sin \beta} = \frac{F_3}{\sin \gamma}$

(b) $\frac{F_1}{\sin \beta} = \frac{F_2}{\sin \gamma} = \frac{F_3}{\sin \alpha}$

(c) $\frac{F_1}{\cos \alpha} = \frac{F_2}{\cos \beta} = \frac{F_3}{\cos \gamma}$

(d) $\frac{F_1}{\cos \beta} = \frac{F_2}{\cos \gamma} = \frac{F_3}{\cos \alpha}$

83. Which one of the following is indeterminate beam?

- (a) Simply supported beam
- (b) Cantilever
- (c) One end hinged, other on roller
- (d) Both ends hinged

84. Which one of the following is wrong in the list of assumptions for the analysis of pin jointed truss?

- (a) Load acts at joint only
- (b) Self-weight neglected
- (c) Loads act vertically
- (d) Ends of members are pin connected

85. The coefficient of friction depends upon

- (a) the area of contact
- (b) the roughness of the surface
- (c) the shape of contact area
- (d) all of the above

86. For testing compressive strength of cement, the size of cubes used is

- (a) 50 mm
- (b) 70.6 mm
- (c) 100 mm
- (d) 150 mm

87. M20 concrete means

- (a) 1 : 2 : 4 concrete
- (b) concrete with a strength of 20 kg/sq.cm after 28 days
- (c) concrete with a strength of 20 N/sq.mm after 7 days
- (d) concrete with a strength of 20 N/sq.mm after 28 days

88. Curing of concrete is the process of

- (a) keeping the surrounding cool
- (b) ponding the water on the surface
- (c) covering the surface with wet gunny bags
- (d) maintaining satisfactory moisture and temperature for a specific time

89. *Select your answer according to the coding system given for the assertion A and reason R given in the following item.*

Code:

- (a) Both A and R are true and R is the correct explanation of A.
- (b) Both A and R are true but R is not the correct explanation of A.
- (c) A is true but R is false.
- (d) A is false but R is true.

A: Very thick and heavy timber sections resist fire well.

R: Combustion helps form charcoal in the outer layer and prevents fire from spreading to internal layers.

90. Match List I with List II and select the correct answer code given below the List

List I	List II
Type of stone	Strength
A. Trap 1	104 – 140 N/sq.mm
B. Marble 2	300 – 350 N/sq.mm
C. Granite 3	70 – 210 N/sq.mm
D. Sandstone 4	65 – 70 N/sq.mm

- (a) A – 3 B – 2 C – 1 D – 4
- (b) A – 2 B – 1 C – 4 D – 3
- (c) A – 1 B – 2 C – 4 D – 3
- (d) A – 2 B – 3 C – 1 D – 4

91. *Select your answer code according to the coding system given below for the Assertion (A) and Reason (R):*

A: Invar tape is more accurate

R: It will not undergo change in length due to creep.

- (a) Both A and R are true and R is the correct explanation of A.
- (b) Both A and R are true but R is not the correct explanation of A.
- (c) A is true but R is false.
- (d) A is false but R is true.

92. *Match List I with List II and select the correct answer Code given below:*

List I	List II
A. Ranging rod	1. 4 – 8 m long with alternate colour bands of 200 mm
B. Ranging pole	2. 0.5 – 1.0 m long sticks used for ranging
C. Offset rods	3. 2 to 3 m long with alternate colour bands of 200mm
D. Laths	4. 3 m long rods with narrow slights at right angles to each other at a height of eye

Codes:

- (a) A – 1 B – 3 C – 4 D – 2
- (b) A – 3 B – 1 C – 2 D – 4
- (c) A – 3 B – 1 C – 4 D – 2
- (d) A – 1 B – 3 C – 2 D – 4

93. According to Simpson's rule, if there are n number of segments each of width d , in terms of ordinates area of the figure is (read the characters next to letter O as subscript)
- $A = [(O_1 + O_n) + 4(O_2 + O_4 + \dots + O_{n-1}) + 2(O_3 + O_5 + \dots + O_{n-2})]$
 - $A = [(O_1 + O_n) + 3(O_2 + O_4 + \dots + O_{n-1}) + 2(O_3 + O_5 + \dots + O_{n-2})]$
 - $A = [O_1 + 4(O_2 + O_4 + \dots + O_{n-1}) + 2(O_3 + O_5 + \dots + O_n)]$
 - $A = [O_1 + 2(O_2 + O_4 + \dots + O_{n-1}) + 3(O_3 + O_5 + \dots + O_n)]$
94. If coordinates of stations A, B, C and D are $(x_1, y_1), (x_2, y_2), (x_3, y_3)$ and (x_4, y_4) respectively, the area of $ABCD$ is (read the characters next to letter O as subscript)
- $A = [y_1(x_4 - x_2) + y_2(x_1 - x_3) + y_3(x_2 - x_4) + y_4(x_3 - x_1)]$
 - $A = [y_1(x_1 - x_2) + y_2(x_2 - x_3) + y_3(x_3 - x_4) + y_4(x_4 - x_1)]$
 - $A = [y_1(x_2 - x_3) + y_2(x_3 - x_4) + y_3(x_4 - x_1) + y_4(x_3 - x_2)]$
 - none of the above
95. The following bearings were observed while traversing with a compass.
- | Line | FB | BB |
|------|------|------|
| AB | 80° | 260° |
| BC | 90° | 269° |
| CD | 120° | 301 |
| DA | 319° | 140 |
- Which stations are affected by local attraction?
- A and B
 - B and C
 - C and D
 - D and A
96. The maximum distance between manholes shall be ----- meter unless specially permitted otherwise.
- 30 m
 - 40 m
 - 45 m
 - 60 m
97. Anti-siphonage pipe is connected to _____.
- top of P trap W.C
 - main soil pipe
 - bottom of P trap W.C
 - side of water closet
98. The diameter of a domestic sewer pipe laid at gradient 1 in 100 is recommended to _____
- 100 mm
 - 150 mm
 - 210 mm
 - 400 mm
99. The _____ are used for preventing foul gas from sewers to back flow in the house.
- air fresheners
 - traps
 - naphthalene balls
 - phenyl
100. _____ traps are used for receiving waste water from kitchen sinks, baths and rain and surface water from house.
- Gully
 - Floor
 - Intercepting
 - Reverse

101. *Select your answer according to the coding system given for the Assertion (A) and Reason (R) given below.*
- (a) Both A and R are true and R is the correct explanation of A.
 - (b) Both A and R are true but R is not the correct explanation of A.
 - (c) A is true but R is false.
 - (d) A is false but R is true.

Assertion (A): Rectangular weir formula cannot be used to find out discharge in Cipolletti weir.

Reason (R): In Cipolletti weir decrease in discharge due to end contraction is balanced by the discharge through the triangular portion.

102. *Select your answer according to the coding system given for the Assertion (A) and Reason (R):*
- (a) Both A and R are true and R is the correct explanation of A.
 - (b) Both A and R are true but R is not the correct explanation of A.
 - (c) A is true but R is false.
 - (d) A is false but R is true.

Assertion: Viscosity of a fluid should be considered in analysis of static fluid.

Reason: In static fluid velocity gradient = 0.

103. *Select your answer according to the coding system given for the Assertion (A) and Reason (R):*
- (a) Both A and R are true and R is the correct explanation of A.
 - (b) Both A and R are true but R is not the correct explanation of A.
 - (c) A is true but R is false.
 - (d) A is false but R is true.

Assertion: The canals are generally aligned along the ridge line.

Reason: If canals are aligned along ridge line cross-drainage works are generally not required.

104. *Match List I with List II selecting the answer code given below.*

List I

List II

Techniques of water distribution in the forms

- | | |
|--------------------|-------------------------------------------------------------------------|
| A. Free flooding | 1. Levees are constructed along the contours. |
| B. Border flooding | 2. Ditches are excavated in the field. |
| C. Check flooding | 3. The land is divided into a number of strips separated by low levees. |
| D. Basin flooding | 4. Suitable for orchard trees. |

Codes:

- (a) A - 3 B - 2 C - 1 D - 4
 - (b) A - 2 B - 1 C - 3 D - 4
 - (c) A - 2 B - 3 C - 1 D - 4
 - (d) A - 1 B - 3 C - 4 D - 2
105. The discharge through the sluice of a small irrigation tank is usually controlled by
- (a) dam stone
 - (b) shutter gate
 - (c) plug
 - (d) all of these

106. Select your answer according to the coding system given for the Assertion (A) and Reason (R):

- (a) Both A and R are true and R is the correct explanation of A.
- (b) Both A and R are true but R is not the correct explanation of A.
- (c) A is true but R is false.
- (d) A is false but R is true.

Assertion: The expansion of rails is equal to $L \alpha t$ is wrong.

Reason: Free expansion is prevented by the axial force developed due to fixing of rails to sleeper.

107. A bascule bridge is a
- (a) fixed bridge
 - (b) movable bridge
 - (c) deck bridge
 - (d) through bridge

108. Match List I with List II, selecting the answer code given below :

- List I**
- A. Regulatory sign
 - B. Warning sign
 - C. Informatory sign
 - D. Traffic signal

- List II**
- 1. Curve ahead
 - 2. Red, amber and green lights
 - 3. No entry
 - 4. → To New Delhi

Codes:

- (a) A - 4 B - 1 C - 3 D - 2
- (b) A - 3 B - 1 C - 4 D - 2
- (c) A - 4 B - 2 C - 3 D - 1
- (d) A - 2 B - 3 C - 4 D - 1

109. Match List I with List II, selecting the answer code given :

- List I**
- A. Unit weight of soil solid
 - B. Bulk weight of soil
 - C. Dry unit weight of soil
 - D. Bulk density

- List II**
- 1. W_s / V
 - 2. W / V
 - 3. M / V
 - 4. W_s / V_s

where W = Weight of soil mass, V = Volume of soil (mass)
 W_s = Dry weight of soil, V_s = Volume of soil (solids)
 M = Total mass of soil.

Codes:

- (a) A - 3 B - 2 C - 1 D - 4
- (b) A - 2 B - 3 C - 1 D - 4
- (c) A - 1 B - 3 C - 4 D - 2
- (d) A - 4 B - 2 C - 1 D - 3

110. Match List I with List II, selecting the answer code given below:

List I	List II
A. Consistency index is -ve	1. Soil is at plastic limit.
B. Consistency index is zero	2. Soil is at liquid limit.
C. Consistency index = 1	3. Soil is stiff.
D. Consistency index > 1	4. Soil behaves like liquid.

Codes:

- (a) A - 3 B - 2 C - 1 D - 4
 (b) A - 4 B - 2 C - 1 D - 3
 (c) A - 3 B - 1 C - 2 D - 4
 (d) A - 4 B - 2 C - 3 D - 1

111. Match List I with List II, selecting the answer code given below

List I	List II
Type of soil	Coefficient of earth pressure at rest (K_0)
A. Loose sand, saturated	1. 0.36
B. Loose sand, dry	2. 0.46
C. Dense sand saturated	3. 0.49
D. Dense sand, dry	4. 0.64

Codes:

- (a) A - 1 B - 3 C - 2 D - 4
 (b) A - 3 B - 1 C - 4 D - 2
 (c) A - 2 B - 4 C - 1 D - 3
 (d) A - 4 B - 2 C - 3 D - 1

112. If σ_1 is maximum principal stress, σ_2 is intermediate stress and σ_3 is minimum principal stress, the radius of Mohr's circle for stress is

- (a) $\frac{\sigma_1 + \sigma_2}{2}$
 (b) $\frac{\sigma_1 - \sigma_2}{2}$
 (c) $\frac{\sigma_1 + \sigma_3}{2}$
 (d) $\frac{\sigma_1 - \sigma_3}{2}$

113. Coefficient of volume compressibility is given by where a_v = change in volume, e_0 = initial void ratio and e = final void ratio

- (a) $m_v = \frac{a_v}{1 + e_0}$
 (b) $a_v (1 + e_0)$
 (c) $m_v = \frac{a_v}{1 + e}$
 (d) $a_v (1 + e)$

114. If e is void ratio and n is porosity then

- (a) $n = \frac{e}{1 + e}$
 (b) $n = \frac{e}{1 - e}$
 (c) $n = \frac{1 + e}{e}$
 (d) $n = \frac{1 - e}{e}$

115. If w is water content, e is porosity, S is saturation degree and G is specific gravity then
- (a) $w = G \times S \times e$
 - (b) $w = \frac{GS}{e}$
 - (c) $w = \frac{Ge}{s}$
 - (d) $\frac{Se}{G}$
116. In a tacheometry, if intercept taken on a vertically held staff is inclined at q to horizontal, the horizontal distance is
- (a) $kS + C$
 - (b) $kS \cos q + C \cos q$
 - (c) $kS \cos^2 q + C \cos q$
 - (d) $kS \sin^2 q + C \sin q$
117. In the tacheometry, if inclined sight q is taken on a staff held normal to the sight, horizontal distance is
- (a) $(kS + C) \cos q + r \sin q$
 - (b) $(kS + C) \sin q$
 - (c) $(kS + C) \cos q \sin q + r \sin^2 q$
 - (d) $(kS + C) \tan q$
118. Match List I with List II and select the correct answer Code given below:

List I	List II
Nature of contour lines It indicates	
A. Approximately concentric closed contours with decreasing values towards centre	1. Ridge
B. Approximately concentric closed contours with increasing values towards centre	2. Valley
C. V-shaped contours with convexity towards higher ground	3. Hills
D. U-shaped contours with convexity towards lower ground	4. Pond

- Codes:
- (a) A - 2 B - 3 C - 4 D - 1
 - (b) A - 4 B - 3 C - 1 D - 2
 - (c) A - 3 B - 4 C - 2 D - 1
 - (d) A - 4 B - 3 C - 2 D - 1

119. An imaginary line joining the point of intersection of the cross-hairs of the diaphragm and the optical centre of the object glass is known as
- (a) axis of telescope
 - (b) axis of level tube
 - (c) line of collimation
 - (d) horizontal axis
120. In external-focussing-telescope, for focussing
- (a) eyepiece is moved
 - (b) objective tube is moved
 - (c) either eyepiece or objective piece is moved
 - (d) neither eyepiece nor objective piece is moved

121. A beam has end A fixed end B is on roller and there is internal hinge at C . Its conjugate beam is
- end A free, end B and C on roller
 - end A is hinged, end B fixed, C on roller
 - end A is free, end B fixed, C hinged
 - end A is fixed, and B hinged, C hinged

122. For a rectangular beam of size $b \times d$, with yield stress of steel f_y , area of steel A_{st} , concrete with characteristic strength f_{ck} , for under-reinforced section, neutral axis to depth ratio is given by

(a) $\frac{x_u}{d} = \frac{0.87 f_y A_{st}}{0.36 f_{ck} b d}$

(b) $\frac{x_u}{d} = \frac{0.36 f_{ck} b d}{0.87 f_y A_{st}}$

(c) $\frac{x_u}{d} = \frac{f_y A_{st}}{f_{ck} b d}$

(d) none of the above

123. Figure shown below is that of a simply supported beam. In this four critical points are shown. List 2 gives the failure criteria to be considered at the critical points.



Match List-1 with List-2.

List I	List II
A. Point 1	1. Flexure failure
B. Point 2	2. Shear failure
C. Point 3	3. Shear plus tensile failure
D. Point 4	4. Shear plus compression failure

Codes:

- A - 4 B - 3 C - 1 D - 2
- A - 2 B - 3 C - 1 D - 4
- A - 2 B - 3 C - 4 D - 1
- A - 3 B - 2 C - 4 D - 1

124. List-I shows the end conditions of a column and List-II recommended value of effective length. Match List-I with List-II.

List I	List II
A. At both ends effectively held in position and rotation.	1. $0.65 l$
B. Effectively held in position at both ends but not restrained against rotation.	2. $0.80 l$
C. Effectively held in position and restrained at one end at the other end restrained in rotation but not held in position.	3. $1.0 l$
D. Effectively held in position at both ends but restrained against rotation at only one end.	4. $1.2 l$

Codes:

- (a) A - 1 B - 3 C - 4 D - 2
- (b) A - 1 B - 3 C - 2 D - 4
- (c) A - 2 B - 1 C - 3 D - 4
- (d) A - 2 B - 3 C - 1 D - 4

125. List-I shows the end conditions of a column and List-II theoretical effective length. Match List-I with List-II.

List I	List II
A. Fixed-Fixed	1. $2.0 l$
B. Fixed-Free	2. $1.0 l$
C. Fixed-hinged	3. $0.707 l$
D. Hinged-Hinged	4. $0.50 l$

Codes:

- (a) A - 3 B - 4 C - 2 D - 1
- (b) A - 4 B - 1 C - 3 D - 2
- (c) A - 3 B - 1 C - 2 D - 3
- (d) A - 4 B - 2 C - 3 D - 1

126. Match List I with List II selecting the answer code given below

List I	List II
Type of sewer joints Suitable for	
A. Bandage joint	1. For pipes over 600 m diameter
B. Spigot and socket joint	2. Concrete pipes
C. Collar joint	3. Cast iron pipes of all sizes
D. Filled and poured type	4. For sewers passing below culverts

Codes:

- (a) A - 2 B - 3 C - 1 D - 4
- (b) A - 3 B - 2 C - 1 D - 4
- (c) A - 2 B - 3 C - 4 D - 1
- (d) A - 4 B - 2 C - 3 D - 1

127. Match List I with List II selecting the answer code given below

List I	List II
A. Sewage	1. Drains
B. Sewer	2. Waste water from bathrooms and kitchen
C. Sewerage	3. Discharge from latrines, urinals
D. Sullage	4. Science of carrying wastewater

Codes:

- (a) A - 1 B - 3 C - 4 D - 2
- (b) A - 1 B - 3 C - 2 D - 4
- (c) A - 3 B - 1 C - 2 D - 4
- (d) A - 3 B - 1 C - 4 D - 2

128. Match List I with List II selecting the answer code given below

List I

List II

Name of formula Formula for estimating water demand for fire

A. Kuching's formula

1. $Q = 4637\sqrt{P}(1 - 0.01\sqrt{P})$

B. Buston's formula

2. $Q = 1136(P/5 + 10)$

C. Freeman's formula

3. $Q = 3182\sqrt{P}$

D. National Board of Fire Underwriter's formula

4. $Q = 5663\sqrt{P}$

where Q is quantity in litres/ minute; P is population in thousands

Codes: (a) A - 4 B - 3 C - 1 D - 2

(b) A - 4 B - 2 C - 3 D - 1

(c) A - 3 B - 4 C - 1 D - 2

(d) A - 3 B - 4 C - 2 D - 1

129. Match List I with List II selecting the answer code given below

List I

List II

Flood discharge formula Regions to which applicable

A. Dicken's

1. Old Madras Presidency

B. Ryve's

2. Old Hyderabad state

C. Inglis

3. North and Central India, Western Ghats

D. Nawab Jung Bahadur's Museum

4. Old Bombay Presidency

Codes:

(a) A - 2 B - 1 C - 3 D - 4

(b) A - 3 B - 1 C - 4 D - 2

(c) A - 4 B - 2 C - 3 D - 1

(d) A - 1 B - 2 C - 4 D - 3

130. Which one of the following is not an automatic rain gauge?

(a) Symon's

(b) weighing bucket type

(c) tipping bucket type

(d) float type

131. Free float is mainly used to

(a) identify the activities which can be delayed without affecting the total float of preceding activity

(b) identify the activities, which can be delayed without affecting the total float of succeeding activity

(c) establish priorities

(d) identify the activities which can be delayed without affecting the total float of either the preceding or succeeding activities

132. Critical path

(a) is always longest

(b) is always shortest

(c) may be longest

(d) may be shortest

133. The time by which a particular activity can be delayed without affecting the preceding and succeeding activities is known as

(a) total float

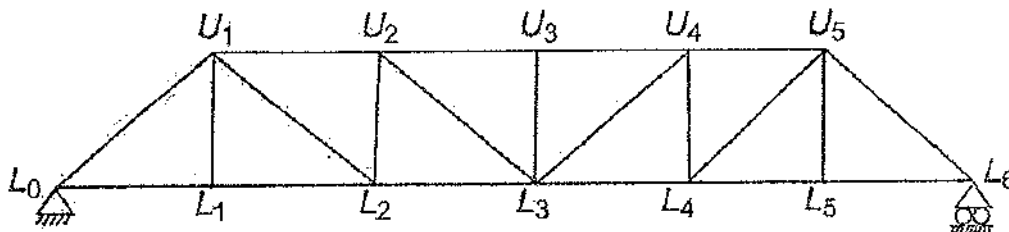
(b) free float

(c) interfering float

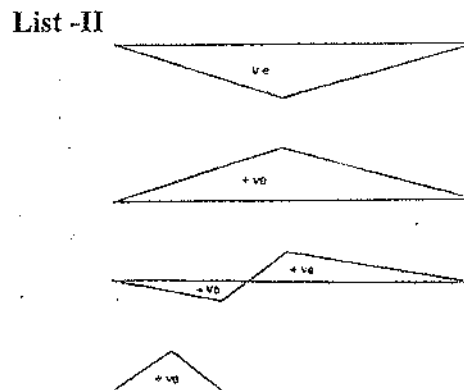
(d) independent float

134. Slack time refers/ is related to
 (a) an activity
 (b) an event
 (c) both event and activity
 (d) none of the above
135. Sinking fund is
 (a) the fund for rebuilding a structure when its economic life is over
 (b) raised to meet maintenance costs
 (c) the total sum to be paid to the municipal authorities by the tenants
 (d) a part of the money kept in reserve for providing additional structures and structural modifications
136. *Select your answer according to the coding system given for the Assertion (A) and Reason (R)*
 Assertion A
 Reason R
 A: In a cable structure horizontal thrust increases with rise in temperature.
 R: Due to rise in temperature the length of cable increases.
- (a) Both A and R are true and R is the correct explanation of A.
 (b) Both A and R are true but R is not the correct explanation of A.
 (c) A is true but R is false.
 (d) A is false but R is true.

137. *Match List I with list II selecting answer code given below*
 Figure shows a typical truss List I shows its member and List II shapes of influence line diagrams for the forces in the member.
 Match List I with List II by selecting answer code given.



- List-I**
- A. L_1U_1 1.
 B. U_2L_3 2.
 C. L_2L_3 3.
 D. U_2U_3 4.



Codes:

- (a) A - 3 B - 4 C - 2 D - 1
 (b) A - 4 B - 3 C - 2 D - 1
 (c) A - 3 B - 2 C - 1 D - 4
 (d) A - 2 B - 3 C - 1 D - 4

138. In a fixed beam of span L subject to udl w /unit length, moment at mid-span is

(a) $\frac{wL^2}{8}$

(b) $\frac{wL^2}{12}$

(c) $\frac{wL^2}{24}$

(d) $\frac{wL^2}{48}$

139. Four point loads 8, 15, 15 and 10 kN have centre-to-centre spacing of 2 m between consecutive loads and they traverse a girder of 30 m span from left to right with 10 kN load leading. The maximum shear force at 8 m from left support will be

- (a) 8.2 kN
- (b) 25.4 kN
- (c) 30.2 kN
- (d) 42.2 kN

140. A propped cantilever of span L is fixed at end A and simply supported at end B . It is subjected to udl of intensity w per unit length. Then the reactions at A and B are

(a) $R_A = \frac{5}{8}wL, R_B = \frac{3}{8}wL$

(b) $R_A = R_B = \frac{wL}{2}$

(c) $R_A = \frac{3}{8}wL, R_B = \frac{5}{8}wL$

(d) $R_A = \frac{wL}{4}, R_B = \frac{3wL}{4}$

141. LAN stands for.....

- (a) Limited Area Network
- (b) Logical Area Network
- (c) Local Area Network
- (d) Large Area Network

142. Which programming languages are classified as low level languages?

- (a) BASIC, COBOL, Fortran
- (b) Prolog
- (c) C, C++
- (d) Assembly languages

143. ALU is

- (a) Arithmetic Logic Unit
- (b) Array Logic Unit
- (c) Application Logic Unit
- (d) None of above

144. A normal CD- ROM usually can store up to _____ data?
 (a) 680 KB
 (b) 680 Bytes
 (c) 680 MB
 (d) 680 GB
145. A computer program that converts an entire program into machine language is called a/an
 (a) Interpreter
 (b) Simulator
 (c) Compiler
 (d) Commander
146. For 100 sq. m cement concrete (1 : 2: 4) 4 cm thick floor, the quantity of cement required, is
 (a) 0.90 cum
 (b) 0.94 cum
 (c) 0.98 cum
 (d) 1.00 cum
147. If B is the width of formation, d is the height of the embankment, side slope S : 1, for a highway with no transverse slope, the area of cross-section is
 (a) $Bd + Sd$
 (b) $Bd + Sd^2$
 (c) $B \times d - Sd^{1/2}$
 (d) $\frac{1}{2} (Bd + Sd^2)$
148. The correct Prismoidal formula for volume is
 (a) D [first area + last area + Even area + 2 odd areas]
 (b) $D/3$ [first area + last area + 4 Even area + 2 odd areas]
 (c) $D/3$ [first area + last area + 2 Even area + 4 odd areas]
 (d) $D/6$ [first area + odd areas]
149. The most reliable estimate is
 (a) Detailed estimate
 (b) Preliminary estimate
 (c) Plinth area estimate
 (d) Cube rate estimate
150. According to Indian Standards Institute, the actual size of modular bricks is
 (a) 23 cm \times 11.5 cm \times 7.5 cm
 (b) 25 cm \times 13 cm \times 7.5 cm
 (c) 19 cm \times 9 cm \times 9 cm
 (d) 20 cm \times 10 cm \times 10 cm

&&&&&

CG appointment - Junior Engineer

Date:10.3.18

Calculator / electronic gadgets are not allowed.

Time **2** hours

No negative marks for wrong answer

All carry equal marks. All to be answered.

1	Energy in the sun is produced as a result of :	
	a) Fusion	b) Combustion
	c) Explosion	d) Thermo nuclear Fission
2	Ampere is used to measure:	
	a) Temperature	b) Current
	c) Weight	d) Light
3	Bermoulli's theorem is applicable to:	
	a) Flow of liquids	b)Viscosity
	c) Surface tension	d) Static fluid pressure
4	All the radio active changes are:	
	a) Zero order reaction	b) First order reaction
	c) Second order reaction	d) Third order reaction
5	Niagara Falls is one of the border of:	
	a) France & Germany	B) Nigeria & Congo
	c) USA & Canada	d) Nigeria & Kenya
6	The atmosphere is held to the earth by:	
	a) Gravity	b) Surface tension
	c) Rotation of earth	d) Sun
7	Polarization is a characteristic of:	
	a) Light wave	b) Sound wave
	c) Water wave	d) Heat wave
8	The first Governor General of free India was:	
	a) Rajendra Prasad	b) C. Rajagopalachari
	c) Lord Mountbatten	d)Padmaja Naidu
9	The capital of Australia is:	
	a) Sydney	b) Melbourne
	c) Canberra	d) Brisbane
10	The angle of elevation of the sun if the length of the shadow of a tower is $\sqrt{3}$ times the height of the tower is:	
	a) 30°	b) 60°
	c) 45°	d) 150°
11	Palghat is a division of which of the following Railways:	
	a) Southern Railway	b)South Eastern Railway
	c) South Central Railway	d) South Western Railway
12	The world standard time is taken from:	
	a) Florence	b) Kentucky
	c) Miami	d) Greenwich

13	The largest ocean in the world is:	
	a) Atlantic ocean	b) Indian Ocean
	c) Pacific ocean	d) Arctic ocean
14	Which of the following has the greatest viscosity?	
	a) air	b) hydrogen
	c) water	d) mercury
15	The planet in the solar system which is closest to the sun is:	
	a) Mercury	b) Venus
	c) Earth	d) Pluto
16	JallianwalaBagh massacre took place in:	
	a) Ambala	b) Jalandhar
	c) Amritsar	d) Lahore
17	Pick the odd man out:	
	a) flower	b) branch
	c) thorn	d) fruit
18	The author of "God of small things" is:	
	a) Salman Rushdie	b) Arundhati Roy
	c) Rohinton Mistry	d) Amit Chowdhury
19	The colours known as primary colours are:	
	a) red, yellow, green	b) red, blue, green
	c) red, black, yellow	d) red, blue, yellow
20	X-ray consist of stream of:	
	a) Protons	b) electrons
	c) neutrons	d) photons
21	The longest river in the world is:	
	a) Ganga	b) Volga
	c) Nile	d) Hwang Ho
22	The ball pen works on the principle of	
	a) viscosity	b) gravity
	c) capillary action and surface tension	d) Boyle's law
23	The density of water is maximum at:	
	a) 0° C	b) 4° C
	c) 0° F	d) 4° K
24	Photosynthesis is a process related to:	
	a) plants	b) animals
	c) bacteria	d) colour photography
25	The number of states in India	
	a) 26	b) 27
	c) 29	d) 30
26	The HCF of 595 and 252 is:	
	a) 1	b) 7
	c) 11	d) 17

27	The LCM of 26, 56, 104 and 182 is:	
	a) 456	b) 728
	c) 748	d) 1274
28	By selling a tape-recorder for Rs.950/- I lose 5%. What percentage shall I gain by selling it for a 1040?	
	a) 4%	b) 4.5%
	c) 40%	d) 5%
29	5 men or 9 women can do a piece of work 19 days. In how many days will 3 men and 6 women working together will finish the work?	
	a) 10 days	b) 15 days
	c) 87 days	d) 38 days
30	The radius of the wheel of a vehicle is 70 Cm. The wheel makes 10 revolutions in 5 seconds. The speed of the vehicle is:	
	a) 29.46 Km/hr	b) 31.68 Km/hr
	c) 36.25 Km/hr	d) 32.72 Km/hr
31	Two pipes can fill a tank in 20 minutes and 30 minutes respectively. If both the pipes are opened simultaneously, then the tank will be filled in:	
	a) 10 minutes	b) 12 minutes
	c) 15 minutes	d) 25 minutes
32	A towel, when bleached, lost 20% of its length and 10% of its breadth. What is the percentage decrease in area?	
	a) 30 %	b) 32%
	c) 28%	d) 26%
33	A person walked diagonally across a square plot. Approximately, what was the percent saved by not walking along the edges?	
	a) 35 %	b) 30 %
	c) 20 %	d) 25 %
34	A train 132 metre long passes a telegraph post in 6 seconds. The speed of the train is:	
	a) 70 Km / hr	b) 72 Km / hr
	c) 79.2 Km / hr	d) 80 Km / hr
35	A man covers half of his journey at 6 Km / hr and the remaining half at 3 Km / hr. His average speed is:	
	a) 4 Km / hr	b) 4.5 Km / hr
	c) 9 Km / hr	d) 3 Km / hr
36	Find the value of $3 + 0.03 + 0.003 + 0.0003$	
	a) 12	b) 3.0333
	c) 3.3333	d) 6.0333
37	The $\frac{4}{5}$ of a certain number is 64. Half of the number is	
	a) 40	b) 32
	c) 80	d) 16
38	Two angles are complementary, if the sum of their measures is:	
	a) 90°	b) 100°
	c) 180°	d) 360°

39	If $1120/\sqrt{P} = 80$, then $P = ?$	
	a) 14	b) 140
	c) 196	d) 225
40	The average monthly income of A and B is Rs. 5050. The average monthly income of B and C is Rs. 6250 and the average monthly income of A and C is Rs. 5200. What is the monthly income of A?	
	a) 2000	b) 3000
	c) 4000	d) 5000
41	Two numbers are in the ratio 2 : 3. If their L.C.M. is 48. what is sum of the numbers?	
	a) 28	b) 40
	c) 64	d) 42
42	Which of the following fraction is the largest?	
	a) $11/12$	b) $41/50$
	c) $21/40$	d) $5/6$
43	Find the greatest common divisor of 24 and 16	
	a) 6	b) 2
	c) 4	d) 8
44	If 20% of $a = b$, then $b\%$ of 20 is the same as:	
	a) None of these	b) 10% of a
	c) 4% of a	d) 20% of a
45	How many litres of pure acid are there in 8 litres of a 20% solution?	
	a) 2 litres	b) 1.4 litres
	c) 1 litre	d) 1.6 litres
46	A man is 24 years older than his son. In two years, his age will be twice the age of his son. What is the present age of his son?	
	a) 23 years	b) 22 years
	c) 21 years	d) 20 years
47	A is two years older than B who is twice as old as C. The total of the ages of A, B and C is 27. How old is B?	
	a) 10	b) 9
	c) 8	d) 7
48	A sum of money at simple interest amounts to Rs. 815 in 3 years and to Rs. 854 in 4 years. The sum is :	
	a) Rs. 700	b) Rs. 690
	c) Rs. 650	d) Rs. 698
49	P is able to do a piece of work in 15 days and Q can do the same work in 20 days. If they can work together for 4 days, what is the fraction of work left?	
	a) $8/15$	b) $7/15$
	c) $11/15$	d) $2/11$
50	$5216 \times 51 = ?$	
	a) 266016	b) 212016
	c) 266436	d) 216314

51	Insert the missing letter: C 4 K 2 O 3 ...	
	a) W	b) X
	c) T	d) U
52	Which is the odd man out:	
	a) CAR	b) AEROPLANE
	c) BUS	d) TRAIN
53	If NOIDA is written as 39658 , how will INDIA be written	
	a) 36568	b) 63568
	c) 63569	d) 65368
54	In the alternatives given below, three are alike in some manner while the fourth one is different. Choose the odd one:	
	a) Run	b) Walk
	c) Think	d) Jump
55	In the alternatives given below, three are alike in some manner while the fourth one is different. Choose the odd one:	
	a) Triangle	b) Tangent
	c) Square	d) Rhombus
56	Gravity is related to 'Pull' in the same way as 'Magnetism' is related to:	
	a) Repulsion	b) Separation
	c) Attraction	d) Push
57	Look at this series: 7, 10, 8, 11, 9, 12, ... What number should come next?	
	a) 7	b) 10
	c) 12	d) 13
58	Look at this series: 14, 28, 20, 40, 32, 64, ... What number should come next?	
	a) 52	b) 56
	c) 96	d) 128
59	Which word does NOT belong with the others?	
	a) tyre	b) steering wheel
	c) engine	d) car
60	Which word does NOT belong with the others?	
	a) unimportant	b) trivial
	c) insignificant	d) familiar
61	Economizer is used in a steam power plant to heat	
	a) air	b) feed water
	c) fuel gases	d) steam
62	Francis turbines usually used for	
	a) low head installation upto 30m	b) medium head installation from 30 to 180 m
	c) high head installation above 180m	d) for all heads
63	Overall efficiency of Thermal plant is equal to	
	a) Rankine cycle efficiency	b) Carnot cycle efficiency
	c) Regenerative cycle efficiency	d) Boiler efficiency x Turbine efficiency X generator efficiency

64	Water hammer is developed in	
	a) Penstock	b) draft tube
	c) turbine	d) surge tank
65	Thermal efficiency of a gas turbine plant as compared to diesel engine plant is	
	a) higher	b) lower
	c) same	d) un predictable
66	For safety of steam boiler the number of safety valves fitted are	
	a) 1	b) 2
	c) 3	d) 4
67	Which material is the most commonly used moderator	
	a) Graphite	b) Sodium
	c) Deuterium	d) any of the above
68	The unit of N m is called	
	a) Joule (J)	b) Watt (W)
	c) Calorie	d) none of the above
69	First law of thermodynamics is given by	
	a) Joule (J)	b) Watts (W)
	c) Wilson	d) Charles
70	Entropy depends upon	
	a) heat and work	b) volume and temperature
	c) temperature and pressure	d) all of the above
71	Ratio of linear stress to linear strain is known as:	
	a) Poisson's ratio	b) bulk modulus
	c) Modulus of rigidity	d) Modulus of elasticity
72	Hook's law holds good up to	
	a) Proportional limit	b) Yield point
	c) Elastic limit	d) Plastic limit
73	The property by virtue of which a metal can be beaten into plates is called:	
	a) Ductility	b) Malleability
	c) Resilience	d) Plasticity
74	The diameter of a mild steel round bar, on which tensile test is performed, at fracture the diameter will:	
	a) Increase	b) Decrease
	c) Same	d) None of the above
75	The strips in the Laminated spring are in different lengths for:	
	a) Improved appearance	b) Material economy
	c) Equal distribution of stress	d) Reducing the weight
76	Which one of the following is a lower pair?	
	a) Ball and roller bearing	b) Automobile steering gear
	c) Cam and follower	d) Belt and chain drives.

77	Creep in belt drive is due to	
	a) Weak material of the belt	b) Weak material of the pulley
	c) Uneven extensions and contractions of the belt when it passes from tight side to slack side.	d) None of the above
78	In simple trains of three wheels, the third wheel will rotate	
	a) In the opposite direction of the first wheel	b) In the same direction of the first wheel
	c) In any direction	d) None of the above
79	The time taken by a vibrating body to complete one cycle is known as:	
	a) Period	b) Frequency
	c) Resonance	d) Damping
80	A shaft with three rotors will have	
	a) Three nodes	b) Two nodes
	c) One node	d) Six nodes
81	For a heat engine operating the Carnot cycle, the work output is 25% of heat rejected to the sink. The thermal efficiency of the engine would be:	
	a) 10%	b) 20%
	c) 30%	d) 50%
82	The ratio of brake power to indicated power of an IC engine is called	
	a) Mechanical efficiency	b) Thermal efficiency
	c) Volumetric efficiency	d) Relative efficiency
83	In a four stroke cycle engine, the four operations suction, compression, expansion and exhaust are completed in the number of revolutions of crankshaft equal to:	
	a) 1	b) 2
	c) 3	d) 4
84	Function of governor is to :	
	a) maintain the engine speed	b) Maintain the speed of engine constant
	c) Store energy and give up whenever required	d) Adjust variation of speed by varying the input to the engine.
85	In a diesel engine, the fuel is ignited by	
	a) spark	b) injected fuel
	c) heat resulting from compressing air that is supplied for combustion	d) ignitor
86	Scavenging air in diesel engine means	
	a) air used for combustion sent under pressure	b) forced air for cooling cylinder
	c) burnt air containing products of combustion	d) Air used for forcing burnt gases out of engine's cylinder during the exhaust period.
87	Supercharging is the process of	
	a) Supplying the intake of an engine with air at a density greater than the density of the surrounding atmosphere	b) providing forced cooling air
	c) injecting excess fuel for raising more load	d) supplying compressed air to remove combustion products fully.

88	Pick up the wrong statement	
	a) 2-stroke engine can run in any direction	b) In 4-stroke engine, a power stroke is obtained in 4-strokes
	c) thermal efficiency of 4-stroke engine is more due to positive scavenging	d) Petrol engines occupy more space than diesel engines for same power output.
89	Which of the following is not an internal combustion engine	
	a) 2-stroke petrol engine	b) 4-stroke petrol engine
	c) gas turbine	d) steam turbine
90	The process of breaking up or a liquid into fine droplets by spraying is called	
	a) vaporisation	b) carburetion
	c) injection	d) atomisation
91	The air-fuel ratio of the petrol engine is controlled by	
	a) fuel pump	b) governor
	c) carburettor	d) scavenging
92	Diesel fuel, compared to petrol is	
	a) less difficult to ignite	b) just about the same difficult to ignite
	c) more difficult to ignite	d) highly ignitable
93	The weight of flywheel used in two stroke cycle engine as compared to four stroke cycle is	
	a) heavy	b) light
	c) same	d) none
94	The ignition quality of diesel is measured by	
	a) calorific value	b) specific fuel consumption
	c) octane number	d) cetane number
95	Torque developed by the engine is maximum at	
	a) minimum speed of engine	b) maximum speed of engine
	c) maximum volumetric efficiency	d) maximum power
96	Poise is the unit of:	
	a) Mass density	b) Dynamic viscosity
	c) Viscosity	d) Velocity gradient
97	Gauge pressure at a point is equal to:	
	a) Absolute pressure plus atmosphere pressure	b) Absolute pressure minus atmosphere pressure
	c) Vacuum pressure plus absolute pressure	d) None of the above
98	Venturimeter is used to measure	
	a) Discharge	b) Average velocity
	c) Velocity at a point	d) Pressure at a point
99	Efficiency of the jet of water having velocity V and striking a series of vertical plates moving with a velocity u, is maximum when	
	a) $u = 2V$	b) $u = V/2$
	c) $u = 3V/2$	d) $u = 4V/3$

100	The total energy of flowing water in a channel with respect to bed of channel is known as	
	a) Total energy	b) Specific energy
	c) Hydraulic gradient	d) Mechanical energy
101	Atmospheric pressure head in terms of water column is	
	a) 7.5 m	b) 8.5 m
	c) 9.81 m	d) 10.30 m
102	Manometer is a device used for measuring	
	a) velocity at a point in a fluid	b) pressure at a point in a fluid
	c) discharge of a fluid	d) none of the above
103	The flow in the pipe is a laminar if	
	a) Reynold number = 2500	b) Reynold number = 4000
	c) Reynold number > 2500	d) Reynolds number < 2500
104	Maximum efficiency of power transmission through pipeline is	
	a) 50%	b) 66.67%
	c) 75%	d) 100%
105	Sonic-flow means	
	a) Mach number < 1.0	b) Mach number = 1.0
	c) Mach number > 1.0	d) none of the above
106	Slip in belt drive is	
	a) loss of power	b) difference between velocities of two pulleys
	c) difference between angular velocities of two pulleys	d) difference between linear speed of the rim of pulley and the belt on it
107	The pulley in a belt drive acts as	
	a) rolling pair	b) sliding pair
	c) turning pair	d) cylindrical pair
108	In an automobile the power is transmitted from gear box to differential through	
	a) knuckle joint	b) universal joint
	c) Hooke's joint	d) bevel gears
109	Which of the following effects is more dangerous for a ship	
	a) rolling	b) waving
	c) pitching	d) steering
110	Which of the following is a permanent fastening?	
	a) bolts	b) keys
	c) screws	d) rivets
111	The function of a washer is to	
	a) provide cushioning effects	b) provide bearing area
	c) absorb shocks and vibrations	d) provide smooth surface in place of rough surface
112	Gear box is used to	
	a) produce torque	b) speed reduction
	c) obtain variable speeds	d) increase efficiency of system

113	Tolerances are specified	
	a) to obtain desired fits	b) because it is not possible to manufacture a size exactly
	c) to obtain high accuracy	d) to have proper allowance
114	A feeler gauge is used to check	
	a) radius	b) surface roughness
	c) thickness of clearance	d) unsymmetrical shape
115	V-block is used in workshop to check	
	a) roundness of a cylindrical	b) surface roughness
	c) dimensions of oval job	d) taper on a job
116	Which of the following couplings is used to connect two shafts which are not parallel(or which are out of line	
	a) muff-coupling	b) flange-coupling
	c) Oldham-coupling	d) none of the above
117	Knurling is an operation	
	a) of cutting smooth collars	b) of under cutting
	c) of generally roughing the surface fro hand grip	d) done prior to screw cutting
118	A 30 ton press means	
	a) gross weight of the press is 30 tons	b) weight of die is 30 tons
	c) pressure exerted by slide is 30 tons	d) flywheel of the press weighs 30 tons
119	Which of the following is the most important characteristic of a measuring instrument?	
	a) precision	b) accuracy
	c) repeatability	d) sensitivity
120	Statistical quality control techniques are based on the theory of	
	a) quality	b) statistics
	c) probability	d) control
121	Gantt charts provide information about	
	a) break even point analysis	b) production schedule
	c) material handling layout	d) value analysis
122	Most popular type of organization used for civil engineering constructions is	
	a) line organization	b) line and staff organization
	c) functional organization	d) effective organization
123	Basic tool in work study is	
	a) graph paper	b) process chart
	c) planning chart	d) stop watch
124	Salvaging means	
	a) writing off the assets	b) throwing away the assets
	c) selling the assets	d) disposing off property which is no longer useful in present situation

125	Which process will improve the fatigue life of a part?	
	a) shot peening	b) electroplating
	c) chemical coating	d) polishing
126	When an elevator moves upwards with uniform acceleration the apparent weight of a body kept in the elevator is	
	a) decreased	b) increased
	c) same	d) None of the above
127	A rocket is moving upwards with acceleration $5g$. The effective weight of an observer weighing 100 Kg sitting in the rocket will be	
	a) 200 Kg	b) 600 Kg
	c) 500 Kg	d) None of the above
128	Colours produced by thin film of oil on the surface of water is due to:	
	a) reflection of light	b) diffraction of light
	c) interference phenomenon	d) None of the above
129	The brake commonly used in train bogies is:	
	a) internal expanding	b) band brake
	c) Band and block brake	d) shoe brake
130	The ratio of number of teeth and pitch circle diameter in a gear is called	
	a) pitch	b) circular pitch
	c) diametrical pitch	d) module
131	Bevel protractor is used for	
	a) Linear measurement	b) angular measurement
	c) Flatness measurement	d) Parallelism measurement
132	Bin cards are used in	
	a) Machine loading	b) accounts
	c) stores	d) preventive maintenance
133	In breakeven analysis the total cost consists of	
	a) fixed cost	b) variable cost
	c) fixed + variable cost	d) fixed cost + variable cost + profit
134	Heat treatment is done to	
	a) Change grain size	b) Soften the metal
	c) relieve internal stresses set up during cold and hot working.	d) All of the above
135	Zener diode is used as	
	a) voltage reference	b) relay
	c) switching circuits	d) None of the above
136	Which one of the following is organic material	
	a) Zinc	b) Iron
	c) Silicon Carbide	d) Wood
137	The property of material to resist penetration by another material is known as	
	a) toughness	b) hardness
	c) stiffness	d) resilience

138	Which tool material is the hardest	
	a) ceramic tool	b) steel tool
	c) diamond tool	d) cemented carbide tool
139	Under microscope, ferrite appears as	
	a) white	b) dark
	c) light	d) finger print
140	Carbon steel contains carbon from	
	a) 0.1 to 0.8 %	b) 0.1 to 1.1 %
	c) 1.8 to 4.2 %	d) 0.1 to 1.5 %
141	A three layer p-n-p device can be used as	
	a) an amplifier	b) a rectifier
	c) Zener diode	d) none of the above
142	The binary system uses powers of	
	a) 2	b) 10
	c) 8	d) 16
143	Algorithm and Flow chart help us to	
	a) Know the memory capacity	b) Identify the base of a number system
	c) Direct the output to a printer	d) Specify the problem completely and clearly
144	The difference between memory and storage is that memory is _____ and storage is _____	
	a) temporary, permanent	b) permanent, temporary
	c) slow, fast	d) input, output
145	What is required when more than one person uses a central computer at the same time?	
	a) Light pen	b) Mouse
	c) Digitizer	d) Terminal
146	The term gigabyte refers to	
	a) 1024 bytes	b) 1024 kilobytes
	c) 1024 megabytes	d) 1024 pentabyte
147	The arranging of data in a logical sequence is called	
	a) sorting	b) classifying
	c) reproducing	d) summarizing
148	DSL stands for _____	
	a) data subscriber lines	b) dual subscriber lines
	c) delay subscriber lines	d) digital subscriber lines
149	A new printer can be added by printer option in	
	a) File manager	b) My computer
	c) Windows control panel	d) None of the above
150	Undo is similar to	
	a) Ctrl + X	b) Ctrl + Z
	c) Ctrl + U	d) Ctrl + C

SOUTHERN RAILWAY

SUITABILITY TEST FOR JUNIOR ENGINEER (ENGINEERING DEPARTMENT)

Instructions to Candidates:

- Answer all Questions
- All Questions carry equal marks & No negative marks for wrong answer
- Calculator or any other electronic devices are not allowed

Maximum Marks: 150 x 1 = 150

Duration: Two hours

- 1) Chief Minister of which state has decided to present a separate agriculture budget for the state from next year?
 - A. Telangana
 - B. Andhra Pradesh
 - C. Bihar
 - D. Jharkhand
 - E. Chhattisgarh

- 2) 'National Doctor's Day' is celebrated in India on which date every year?
 - A. July 1
 - B. July 2
 - C. July 3
 - D. July 4
 - E. July 5

- 3) As per the amended Legal Metrology rules for packaged commodities, which will come into effect from _____, the Centre has clarified that the retail sale price shall be the Maximum Retail Price (MRP) inclusive of all taxes.
 - A. September 1, 2017
 - B. October 1, 2017
 - C. November 1, 2017
 - D. December 1, 2017
 - E. January 1, 2018

- 4) Retirement fund body EPFO has inked pacts with five banks for collections of provident dues and to make retirement payments. Which among the following is NOT one of the five banks?
 - A. ICICI Bank
 - B. Axis Bank
 - C. Kotak Mahindra Bank
 - D. Bank of Baroda
 - E. State Bank of India

- 5) India's first university, only for Dalit students will come up in which city by 2018?
- A. Patna
 - B. Pune
 - C. Kanpur
 - D. Bhopal
 - E. Hyderabad
- 6) Who among the following has been appointed as Director General of Goods and Services Tax Intelligence (DG GSTI)?
- A. William Francis
 - B. John Joseph
 - C. Robert Fernandes
 - D. Alfred Gomez
 - E. Peter Gomes
- 7) The government has merged the Urban Development and Housing and Urban Poverty Alleviation Ministries. The merged ministry will now be known as:
- A. Ministry of Affordable Housing and Poverty Alleviation
 - B. Ministry of Housing and Urban Affairs
 - C. Ministry of Housing and Urban Revival
 - D. Ministry of Affordable Housing and Urban Affairs
 - E. Ministry of Housing Assistance and Urban Development
- 8) Which country topped the medals tally at 2017 Asian Athletics Championships?
- A. China
 - B. Kazakhstan
 - C. India
 - D. Vietnam
 - E. Iran
- 9) On July 10, 2017, which among the following became the second state to launch e-RTI portal that will enable citizens to file online Right to Information (RTI)?
- A. Delhi
 - B. Madhya Pradesh
 - C. Himachal Pradesh
 - D. Sikkim
 - E. Manipur
- 10) What was the theme of 'World Population Day 2017' observed on July 11, 2017?
- A. 'Sustainable Population Growth.
 - B. 'Inclusive Population Growth'
 - C. 'Family Planning: Empowering People, Developing Nations'
 - D. 'Population and Empowerment of Weaker Sections'
 - E. 'Creating Awareness about Family Planning'

- 11) On July 12, 2017 Indian Railways launched _____, a virtual server with an inbuilt security system that will enable faster connectivity at a reduced cost.
- A. RailRAM
 - B. RailCloud
 - C. RailStore
 - D. RailServer
 - E. RailBlock
- 12) Which programme has been launched by Yes Bank to help Micro, Small and Medium Enterprises (MSMEs) understand the impact of the proposed changes and prepare them for migration to the new GST tax system?
- A. 'CLEAR GST'
 - B. 'GST FRIEND'
 - C. 'GST GURU'
 - D. 'GST EXPERT'
 - E. 'YES GST'
- 13) BJP President Amit Shah and RSS Chief Mohan Bhagwat recently released a coffee table book on Prime Minister Narendra Modi's life in New Delhi. The book – 'Making of A Legend', has been compiled by:
- A. Rajat Sharma
 - B. Shekhar Gupta
 - C. Arnab Goswami
 - D. Bindeshwar Pathak
 - E. Rajdepp Sardesai
- 14) World day against child labour
- A. 12 January
 - B. 18 May
 - C. 12 June
 - D. 1 December
 - E. None of the above
- 15) Indian Railways has launched an integrated mobile application to cater to various passenger requirements, including ticket booking, inquiry, on-board cleaning and ordering meal on a single platform. This app is called:
- A. 'Rail SAARTHI'
 - B. 'Rail SEVAK'
 - C. 'Rail MITR'
 - D. 'Rail HUMSAFAR'
 - E. 'Rail SUVIDHA'

- 16) Which among the following railway station in Mumbai has become India's first railway station run by women?
- A. Vashi Railway Station
 - B. Matunga Railway Station
 - C. Kalyan Railway Station
 - D. Bandra Railway Station
 - E. Andheri Railway Station
- 17) 'International Justice Day', is celebrated on which date every year?
- A. 16th July
 - B. 17th July
 - C. 18th July
 - D. 19th July
 - E. 20th July
- 18) On July 19, 2017, Odisha Chief Minister Naveen Patnaik dedicated to the nation the state's longest bridge and named it after:
- A. Rabindranath Tagore
 - B. Mahatma Gandhi
 - C. Jawaharlal Nehru
 - D. Netaji Subhash Chandra Bose
 - E. Biju Patnaik
- 19) "War begins in the minds of men" is a famous Vedic saying. It is stated in:
- A. Atharvaveda
 - B. Mundaka Upanishad
 - C. Samaveda
 - D. Rigveda
 - E. None of the above
- 20) On July 20, 2017, Mr. Ram Nath Kovind was elected as the _____ President of India.
- A. 13th
 - B. 14th
 - C. 15th
 - D. 16th
 - E. 17th
- 21) On July 19, 2017, Reserve Bank of India (RBI) announced that it will shortly issue bank notes of denomination Rs. _____ in Mahatma Gandhi series 2005.
- A. Rs.5
 - B. Rs.10
 - C. Rs.20
 - D. Rs.50
 - E. Rs.100

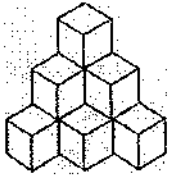
- 22) The Food Safety and Standards Authority of India (FSSAI) has said it is banning the use of stapler pins in tea bags with effect from:
- A. September 1, 2017
 - B. October 1, 2017
 - C. November 1, 2017
 - D. December 1, 2107
 - E. January 1, 2018
- 23) Defence Research and Development Organisation (DRDO) has developed and unmanned, remotely operated tank named:
- A. 'Alpha'
 - B. 'Muntra'
 - C. 'Rudra'
 - D. 'Vraj'
 - E. Trishul'
- 24) On July 27, 2017, Government launched which apps for dissemination of earthquake parameters to the user community in timely manner for their safety.
- A. 'India Sandesh'
 - B. 'India Quake'
 - C. 'India Tectonic'
 - D. 'India Richter'
 - E. 'India Quartz'
- 25) Which Indian city has ranked 40th out of 50 cities on Women Entrepreneur (WE) Cities Index 2017 that ranks cities in terms of its ability to attract and foster growth of women - owned firms?
- A. Mumbai
 - B. Delhi
 - C. Benglauru
 - D. Chennai
 - E. Ahmedabad
26. $0.003 \times 0.02 = ?$
- A. 0.06
 - B. 0.006
 - C. 0.0006
 - D. 0.00006
 - E. None of the above

27. If A completes a particular work in 8 days and B the same work in 24 days. How many days will it take if they work together?
- A. 4
 - B. 5
 - C. 6
 - D. 7
 - E. None of the above
28. What comes next in the sequence: 1, 3, 11, 43, ____?
- A. 161
 - B. 171
 - C. 181
 - D. 191
 - E. None of the above
29. 9, 12, 11, 14, 13, ?, 15
- A. 12
 - B. 16
 - C. 10
 - D. 17
 - E. None of the above
30. A train 140 m long is running at 60kmph. In how much time will it pass a platform 260 m long?
- A. 15 seconds
 - B. 24 seconds
 - C. 28 seconds
 - D. 30 seconds
 - E. None of the above
31. A train covers a distance in 50 min, if it runs at a speed of 48kmph on an average. The speed at which the train must run to reduce the time of journey to 40min will be
- A. 45 kmph
 - B. 60 kmph
 - C. 55 kmph
 - D. 70 kmph
 - E. None of the above
32. The ratio between the speeds of the A& B is 2:3, and therefore A takes 10 min more than the time taken by B to reach the destination. If A had walked at double the speed, he would have covered the distance in
- A. 8 min
 - B. 12 min
 - C. 15 min
 - D. 18 min
 - E. None of the above

33. The ratio between the speeds of two trains is 7 : 8. If the second train runs 400 kms in 4 hours, then the speed of the first train is:
- A. 70 km/hr
 - B. 75 km/hr
 - C. 84 km/hr
 - D. 87.5 km/hr
 - E. None of the above
34. A train 150 m long is running at a speed of 68 kmph. How long does it take to pass a man who is running at 8 kmph in the same direction as the train?
- A. 5 sec
 - B. 9 sec
 - C. 12 sec
 - D. 15 sec
 - E. None of the above
35. A man sitting in a train which is travelling at 50 kmph observes that a goods train, travelling in opposite direction, takes 9 seconds to pass him. If the goods train is 280 m long, find its speed.?
- A. 50 kmph
 - B. 58 kmph
 - C. 62 kmph
 - D. 65 kmph
 - E. None of the above
36. If 5 women or 8 girls can do a work in 84 days. In how many days can 10 women and 5 girls can do the same work?
- A. 32 days
 - B. 48 days
 - C. 52 days
 - D. 38 days
 - E. None of the above
37. A and B are working on an assignment. A takes 6 hours to type 32 pages on a computer, while B takes 5 hours to type 40 pages. How much time will they take, working together on two different computers to type an assignment of 110 pages?
- A. 5 hours
 - B. 6 hours
 - C. 7 hours
 - D. 8 hours
 - E. None of the above
38. If 30% of a number is 12.6, find the number?
- A. 45
 - B. 38
 - C. 40
 - D. 42
 - E. None of the above

39. A student is ranked 13th from right and 8th from left. How many students are there in total?
- A. 18
 - B. 19
 - C. 20
 - D. 21
 - E. None of the above
40. A goat is tied to one corner of a square plot of side 12m by a rope 7m long. Find the area it can graze?
- A. 155 sq.m
 - B. 19.25 sq.m
 - C. 144 sq.m
 - D. 38.5 sq.m
 - E. None of the above
41. Speed of a boat in still water is 9 km/hr. It goes 12 km downstream and comes back to the starting point in three hours. What is the speed of water in the stream?
- A. 3.5 km/hr
 - B. 3 km/hr
 - C. 5 km/hr
 - D. 5.5 km/hr
 - E. None of the above
42. The perimeter of a rectangular field is 480 meters and the ratio between the length and breadth is 5:3. The area of the field is
- A. 11,500 m²
 - B. 12,500 m²
 - C. 13,500 m²
 - D. 14,500 m²
 - E. None of the above
43. A school has enough food for 400 children for 12 days. How long will the food last if 10 more children join them?
- A. 7 days
 - B. 8 days
 - C. 9 days
 - D. 10 days
 - E. None of the above
44. A candidate appearing for an examination has to secure 40% marks to pass paper I. But he secured only 40 marks and failed by 20 marks. What is the maximum mark for paper I?
- A. 100
 - B. 150
 - C. 180
 - D. 200
 - E. None of the above

45. When you reverse the digits of age of father, you will get the age of son. One year ago the age of father was twice that of son's age. What are the current ages of father and son?
- A. 73 and 37
 - B. 45 and 54
 - C. 31 and 13
 - D. 24 and 42
 - E. None of the above
46. A man on tour travels first 160 km at 64 km/hr and the next 160 km at 80 km/hr. The average speed for the first 320 km of the tour is
- A. 71.11 km/hr
 - B. 36 km/hr
 - C. 71 km/hr
 - D. 36.33 km/hr
 - E. None of the above
47. What is the sum of two consecutive even numbers, the difference of whose squares is 84?
- A. 32
 - B. 34
 - C. 38
 - D. 42
 - E. None of the above
48. Three numbers are in the ratio of 3: 4 :5 respectively. If the sum of the first and third numbers is more than the second number by 52, then which will be the largest number?
- A. 52
 - B. 65
 - C. 67
 - D. 72
 - E. None of the above
49. If the fractions $\frac{8}{5}$, $\frac{7}{2}$, $\frac{9}{5}$, $\frac{5}{4}$, $\frac{4}{5}$ are arranged in descending order of their values, which one will be fourth?
- A. $\frac{9}{5}$
 - B. $\frac{4}{5}$
 - C. $\frac{5}{4}$
 - D. $\frac{8}{5}$
 - E. None of the above
50. What is 50% of 40% of Rs. 3,450?
- A. Rs. 690
 - B. Rs. 580
 - C. Rs. 670
 - D. Rs. 570
 - E. None of the above



51. How many cubes are there in the figure ?

- A. 9
- B. 7
- C. 8
- D. 10
- E. None of the above



52. What is the minimum number of colours required to fill the spaces in the following diagram without the adjacent sides having the same colour ?

- A. 3
- B. 4
- C. 6
- D. Can not be determined



53. How many triangles are there in the diagram

- A. 8
- B. 4
- C. 10
- D. 16
- E. None of the above



54. The number which is opposite to side 3 is

- A. 4
- B. 5
- C. 6
- D. 2
- E. None of the above

55. 2.09 can be expressed in terms of percentage as
- A. 2.09 %
 - B. 20.9%
 - C. 209%
 - D. 0.209%
 - E. None of the above
56. Evaluate 28% of 450 + 45% of 280
- A. 232
 - B. 242
 - C. 252
 - D. 262
 - E. None of the above
57. Arrange fractions in descending order
- A. $\frac{9}{11} > \frac{8}{9} > \frac{3}{5} > \frac{4}{7}$
 - B. $\frac{9}{11} > \frac{8}{9} > \frac{4}{7} > \frac{3}{5}$
 - C. $\frac{8}{9} > \frac{9}{11} > \frac{3}{5} > \frac{4}{7}$
 - D. $\frac{9}{11} > \frac{3}{5} > \frac{8}{9} > \frac{4}{7}$
 - E. None of the above
58. Evaluate : $6202.5 + 620.25 + 62.025 + 6.2025 + .62025$
- A. 6791.59775
 - B. 6891.59775
 - C. 6891.59675
 - D. 5891.59775
 - E. None of the above
59. Which is in ascending order
- A. $\frac{1}{3}, \frac{2}{5}, \frac{3}{5}, \frac{6}{7}$
 - B. $\frac{2}{5}, \frac{1}{3}, \frac{3}{5}, \frac{6}{7}$
 - C. $\frac{1}{3}, \frac{2}{5}, \frac{6}{7}, \frac{3}{5}$
 - D. $\frac{3}{5}, \frac{6}{7}, \frac{1}{3}, \frac{2}{5}$
 - E. None of the above
60. Evaluate $\sqrt{248} + \sqrt{64}$
- A. 14
 - B. 26
 - C. 16
 - D. 36
 - E. None of the above

61. $|2| + |-2| + (2)^2 + (-2)^2 = ?$

- A. 6
- B. 8
- C. 10
- D. 12

62. If

$$\frac{x}{2} + 4 = \frac{7}{2} \quad \text{then } x = ?$$

- A. -2
- B. -1
- C. 1
- D. 2

63. What comes next in the sequence: 2, 4, 10, 28, ___ ?

- A. 64
- B. 70
- C. 76
- D. 82

64. $106 \times 106 - 94 \times 94 = ?$

- A. 2004
- B. 2400
- C. 1904
- D. 1906

65. Evaluation of $8^3 \times 8^2 \times 8^{-5}$ is

- A. 1
- B. 0
- C. 8
- D. None of these

66. A body of mass 4 kg is accelerated upon by a constant force, travels a distance of 5 m in the first second and a distance of 2 m in the third second. The force acting on the body is

- A. 2 N
- B. 4 N
- C. 6 N
- D. 8 N

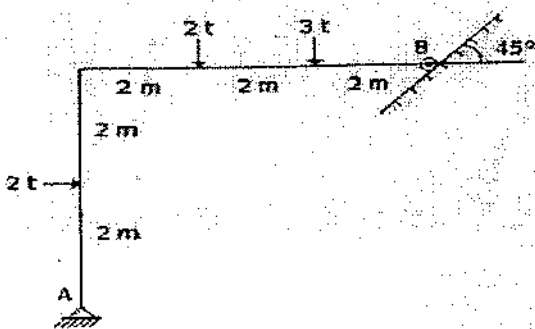
67. A piece of ice is dropped in a vessel containing kerosene. When ice melts, the level of kerosene will

- A. Rise
- B. Fall
- C. Remain same
- D. None of these

68. Young's modulus is the property of
- Gas only
 - Both Solid and Liquid
 - Liquid only
 - Solid only
69. Product of Force and Velocity is called:
- Work
 - Power
 - Energy
 - Momentum
70. Which law is also called the Law of Inertia ?
- Newton's first law
 - Newton's Second Law
 - Newton's Third Law
 - All of these
71. The metallurgical process in which a metal is obtained in a fused state is called
- Smelting
 - Roasting
 - Calcinations
 - Froth floatation
72. The oldest rocks in the earth's crust were once molten, and came from deep inside the earth. The molten rock, called magma, spewed out in volcanic eruptions during the Earth's early life and solidified into hard rock's called
- Granite
 - Basalt
 - Igneous rocks
 - Sedimentary rocks
73. The most commonly used bleaching agent
- Alcohol
 - Carbon dioxide
 - Chlorine
 - Sodium chloride
74. The main use of salt in the diet is to
- make the taste of food better
 - produce in small amounts the hydrochloric acid required for the digestion of food
 - ease the process of cooking
 - increase the solubility of food particles in water
75. The inexpensive and commonly used variety of glass is called soda glass. It is called so because
- was used initially for making bottles of soda(carbonated drink)
 - is made using soda(sodium carbonate)
 - was initially used for storing sodium carbonate
 - is made using soda lime

76. This type of structural steel drawing shows all dimensions necessary for fabrication:
- Shop drawings
 - Design drawings
 - Weldment drawings
 - Application drawings
77. This type of weld is the most common in structural steel fabrication:
- Fillet weld
 - Beam weld
 - Rivet weld
 - Structural weld
78. There are two main types of projection:
- Parallel and Orthographic
 - Station-point and Perspective
 - Parallel and Convergent
 - Perspective and Parallel
79. Architectural drafters generally prefer to use _____ drawings to help illustrate 3-dimensional views of a structure.
- Isometric
 - Perspective
 - Orthographic
 - Auxiliary
80. The architectural drafter usually begins a set of working drawings by creating the _____ plan first.
- Foundation
 - floor plan
 - elevations
 - building section

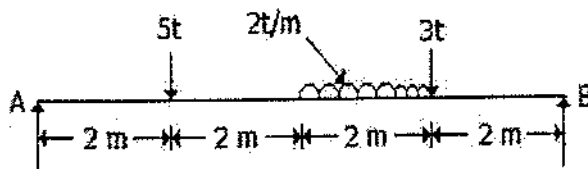
81. The vertical reaction at the support of the structure shown in below figure, is



- 1 t
- 2 t
- 3 t
- 3.5 t

82. The ratio of the moment of inertia of a rectangle about its centroidal axis to the moment of inertia about its base, is
- 1/4
 - 1/2
 - 3/4
 - 2
83. The angular speed of a car taking a circular turn of radius 100 m at 36 km/hr will be
- 0.1 rad/sec
 - 1 rad/sec
 - 10 rad/sec
 - 100 rad/sec
84. The force polygon representing a set of forces in equilibrium is a
- Triangle
 - Open polygon
 - Closed polygon
 - Parallelogram

85. The ratio of the reactions R_A and R_B of a simply supported beam shown in below figure is



- 0.50
 - 0.40
 - 0.67
 - 1.00
86. The portion of the brick cut across its width and having its length equal to that of a full brick, is known as
- Closer
 - Queen closer
 - King closer
 - Prince closer
87. Slump test for concrete is carried out, to determine
- Strength
 - Durability
 - Workability
 - Water content
88. Le-Chatelier's device is used for determining the
- Setting time of cement
 - Soundness of cement
 - Tensile strength of cement
 - Compressive strength of cement

89. Bulking of sand is caused due to
- Surface moisture
 - Air voids
 - Viscosity
 - Clay contents
90. Strength of cement concrete primarily depends upon
- Quality of water
 - Quantity of aggregate
 - Quantity of cement
 - Water-cement ratio
91. The bearing of lines OA and OB are $16^\circ 10'$ and $332^\circ 18'$, the value of the included angle BOA is
- $316^\circ 10'$
 - $158^\circ 28'$
 - $348^\circ 08'$
 - $43^\circ 52'$
92. The back staff reading on a B.M. of R.L. 500.000 m is 2.685 m. If foresight reading on a point is 1.345 m, the reduced level of the point, is
- 502.685 m
 - 501.345 m
 - 501.340 m
 - 504.030 m
93. If V is the speed of a locomotive in km per hour, g is the acceleration due to gravity, G is the distance between running faces of the rails and R is the radius of the circular curve, the required super elevation is
- gV^2/GR
 - Rg/GV^2
 - GR/gV^2
 - GV^2/gR
94. Staff readings on pegs x and y from X station are 1.755 m and 2.850 m, and from station Y on staff head at x and y are 0.655 m and 1.560 m. If reduced level of X is 105.5 m, the reduced level of Y is
- 104.0 m
 - 104.5 m
 - 105.0 m
 - 105.5 m
95. If a tacheometer is fitted with an anallactic lens
- Additive constant is 100, multiplying constant is zero
 - Multiplying constant is 100, additive constant is zero
 - Both multiplying and additive constants are 100
 - Both multiplying and additive constants are 50

96. In the coordinate system of AutoCAD 2008:
- Positive x figures are to the left
 - Positive x figures are to the right
 - Positive x figures are in the direction vertically upwards
 - Positive x figures are in the direction vertically downwards.
97. In AUTOCAD, When using the Rotate tool the angle of rotation is in the following direction:
- Clockwise
 - Anticlockwise
 - The direction in which the cursor is moved
 - There is no fixed rotation direction.
98. When a layer is turned off:
- File space is saved when saving the file
 - It makes no real difference. Details can still be added to the layer
 - Details cannot be erased from the layer
 - Details on the layer cannot be seen.
99. The term UCS stands for:
- User Coordinate State
 - Using Coordinate Screen
 - User Coordinate System
 - User Coordinate Set.
100. The center of gravity of the volume of the liquid displaced by an immersed body is called.
- Metacentre
 - Center of pressure
 - Center of buoyancy
 - Center of gravity
101. A piece of wood having weight 5 kg floats in water with 60% of its volume under the liquid. The specific gravity of wood is
- 0.83
 - 0.6
 - 0.4
 - 0.3
102. A square surface 3 m × 3 m lies in a vertical line in water pipe its upper edge at water surface. The hydrostatic force on square surface is
- 9,000 kg
 - 13,500 kg
 - 18,000 kg
 - 27,000 kg
103. The Discharge through a siphon spillway is
- $C_d \times 2gH$
 - $C_d \times a \times g \times H^{3/2}$
 - $C_d \times a \times g \times H^2$
 - $C_d \times a \times g \times H^{5/2}$

104. Density of water is maximum at

- A. 0°C
- B. 0°K
- C. 4°C
- D. 100°C

105. Dimensions of surface tension are

- A. ML^0T^{-2}
- B. ML^0T
- C. MLT^2
- D. ML^0T^2

106. Border Roads Organisation for hilly regions (India), was formed in

- A. 1947
- B. 1954
- C. 1958
- D. 1960

107. The tangent length of a simple circular curve of radius R

- A. $R \tan \theta$
- B. $R \tan \theta/2$
- C. $R \sin \theta/2$
- D. $R \sin \theta$

108. While calculating the sight distances, the driver's eye above road surface, is assumed

- A. 90 cm
- B. 100 cm
- C. 110 cm
- D. 120 cm

109. The radius of curvature provided along a transition curve, is

- A. Minimum at the beginning
- B. Same throughout its length
- C. Equal to the radius of circular curve
- D. Varying from infinity to the radius of circular curve

110. The most suitable equipment for compacting clayey soils is a

- A. Smooth wheeled roller
- B. Pneumatic tyred roller
- C. Sheep foot roller
- D. Vibrator

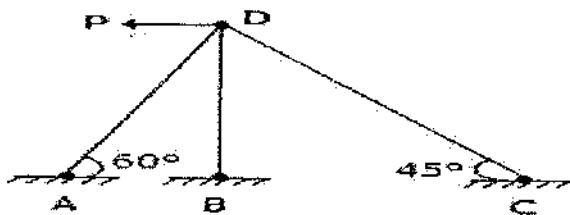
111. Setting out a curve by two theodolite method, involves

- A. Linear measurements only
- B. Angular measurements only
- C. Both linear and angular measurements
- D. None of these

112. The diaphragm of a stadia theodolite is fitted with two additional
- Horizontal hairs
 - Vertical hairs
 - Horizontal and two vertical hairs
 - None of these
113. Tacheometric formula for horizontal distances using horizontal sights can also suitable by suffixing (product by multiplying)
- The constants by $\sin^2 \theta$
 - The constants by $\cos^2 \theta$
 - The constants by $\cos \theta$
 - The multiplying constant by $\cos^2 \theta$ and the additive constant by $\cos \theta$
114. If a tacheometer is fitted with an anallactic lens
- Additive constant is 100, multiplying constant is zero
 - Multiplying constant is 100, additive constant is zero
 - Both multiplying and additive constants are 100
 - Both multiplying and additive constants are 50
115. Pick up the method of surveying in which field observations and plotting proceed simultaneously from the following
- Chain surveying
 - Compass surveying
 - Plan table surveying
 - Tacheometric surveying
116. An under-reinforced section means
- Steel is provided at the underside only
 - Steel provided is insufficient
 - Steel provided on one face only
 - Steel will yield first
117. The percentage of minimum reinforcement of the gross sectional area in slabs, is
- 0.10 %
 - 0.12 %
 - 0.15 %
 - 0.18 %
118. The maximum area of tension reinforcement in beams shall not exceed
- 0.15 %
 - 1.5 %
 - 4 %
 - 1 %
119. In a gusseted base, when the end of the column is machined for complete bearing on the base plate, then the axial load is assumed to be transferred to base plate
- Fully by direct bearing
 - Fully through fastenings
 - 50% by direct bearing and 50% through fastenings
 - 75% by direct bearing and 25% through fastenings

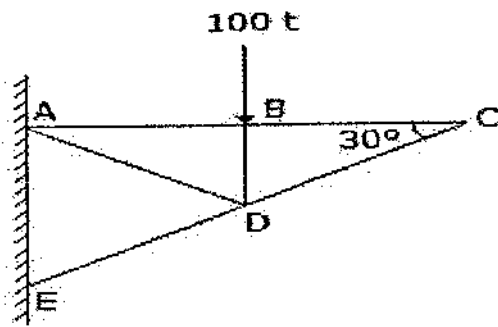
120. Bearing stiffener in a plate girder is used to
- Transfer the load from the top flange to the bottom one
 - Prevent buckling of web
 - Decrease the effective depth of web
 - Prevent excessive deflection
121. Cowl is provided at
- Lower end of ventilating column
 - Upper end of ventilating column
 - Upper end of the manhole
 - First step in manhole
122. If 2% solution of a sewage sample is incubated for 5 days at 20°C and depletion of oxygen was found to be 5 ppm, B.O.D. of the sewage is
- 200 ppm
 - 225 ppm
 - 250 ppm
 - None of these
123. If the depletion of oxygen is found to be 5 ppm after incubating a 2.5% solution of sewage sample for 5 days at 21°C, B.O.D. of the sewage is
- 50 ppm
 - 100 ppm
 - 150 ppm
 - 200 ppm
124. Five day B.O.D. at 15°C of the sewage of a town is 100 kg/day. If the 5 day B.O.D. per head at 15°C for standard sewage is 0.1 kg/day, the population equivalent is
- 100
 - 1000
 - 5000
 - 10000
125. A sewer pipe contains 1 mm sand particles of specific gravity 2.65 and 5 mm organic particles of specific gravity 1.2, the minimum velocity required for removing the sewerage, is
- 0.30 m/sec
 - 0.35 m/sec
 - 0.40 m/sec
 - 0.45 m/sec
126. Consider the following statements:
In the critical path method of construction planning, Free Float can be.
- Greater than Total Float.
 - Greater than Independent Float
 - Equal to Total Float.
 - Less than Independent Float. Of these statements
- 1 and 4 are correct
 - 2 and 3 are correct
 - 2 and 4 are correct
 - 1 and 2 are correct

127. The original cost of an equipment is Rs.10,000. Its salvage value at the end of its total useful life of five years is Rs. 1,000. Its book value at the end of two years of its useful life (as per straight line method of evaluation of depreciation) will be
- Rs. 8,800
 - Rs. 7,600
 - Rs. 6,400
 - Rs. 5,000
128. The reduction in project time normally results in
- Decreasing the direct cost and increasing indirect cost
 - Increasing the direct cost and decreasing the indirect cost
 - Increasing the direct cost and indirect cost both
 - Decreasing the direct cost and indirect cost both
129. Sinking fund is
- The fund for rebuilding a structure when its economic life is over
 - Raised to meet maintenance costs
 - The total sum to be paid to the municipal authorities by the tenants
 - A part of the money kept in reserve for providing additional structures and structural modifications
130. Critical path lies along the activities having total float
- Positive
 - Negative
 - Zero
 - Same
131. $P = 4\pi^2 EI/L^2$ is the equation of Euler's crippling load if
- Both the ends are fixed
 - Both the ends are hinged
 - One end is fixed and other end is free
 - One end is fixed and other end is hinged
132. The degree of indeterminacy of the frame in the given figure, is



- Zero
 - 1
 - 2
 - 3
133. Pick up the **incorrect** statement from the following: The torsional resistance of a shaft is directly proportional to
- Modulus of rigidity
 - Angle of twist
 - Reciprocal of the length of the shaft
 - Moment of inertia of the shaft section

134. In the truss shown in given figure the force in member DC is



- A. 100 t compressive
- B. 100 t tensile
- C. Zero
- D. Indeterminate

135. The equivalent length of a column of length L , having both the ends hinged, is

- A. $2L$
- B. L
- C. $L/2$
- D. L

136. In excel, A function inside another function is called _____

- A. Nested function
- B. Round function
- C. Sum function
- D. Text function

137. Formulas in Excel start with

- A. %
- B. =
- C. +
- D. -

138. Which of the following methods will not enter data in a cell?

- A. Pressing the Esc key
- B. Pressing an arrow key
- C. Pressing the tab key
- D. Clicking the enter button to the formula bar

139. Which function will you use to enter current time in a worksheet cell?

- A) =today()
- B) =now()
- C) =time()
- D) =current Time()

140. When a row of data is to be converted into columns
- Copy the cells in row, select the same number of cells in row and paste
 - Copy the cells in column then choose Edit >> Paste Special, then click Transpose and OK
 - Copy the cells then go to Format >> Cells then on Alignment tab click Transpose check box and click OK
 - Select the cells then place the cell pointer on new cell and choose Edit >> Paste Special, mark Transpose check box and click OK.
141. The brick work is not measured in cu m in case of
- One or more than one brick wall
 - Brick work in arches
 - Reinforced brick work
 - Half brick wall
142. The most reliable estimate is
- Detailed estimate
 - Preliminary estimate
 - Plinth area estimate
 - Cube rate estimate
143. The damp proof course (D.P.C.) is measured in
- cub. m
 - sq. m
 - metres
 - None of these
144. In excel, =SUM (B1 : B8) is an example of a—
- function
 - formula
 - cell address
 - value
 - None of these
145. www means—
- world wide wonder
 - world wide wizard
 - world wide web
 - wide world web
 - None of these
146. When a file contains instructions that can be carried out by the computer, it is often called a(n)file.
- data
 - information
 - executable
 - application
 - None of these

147. CPU is an abbreviation for—
- A. central programming unit
 - B. central processing unit
 - C. computer processing unit
 - D. computer protocol unit
 - E. central protocol unit
148. You can use the.....bar to type a URL and display a Web page, or type a keyword to display a list of related Web pages.
- A. menu
 - B. Title
 - C. Search
 - D. Web
 - E. Address
149. The.....file format is a method of encoding pictures on a computer.
- A. HTML
 - B. JPEG
 - C. FTP
 - D. URL
 - E. (E) DOC
150. The only things moving around inside a computer are
- A. 1s and 0s
 - B. electrons
 - C. bytes
 - D. proton
 - E. All of the above

SOUTHERN RAILWAY

Question Paper for Suitability Test for Sr.Section Engineer in Engineering Department in Pay Matrix level 7 in 7th PC. (G.P. Rs.4600/- in 6th PC) on Compassionate grounds.

Total Marks - 150

Date - 07.10.2017

Duration- 2.00 Hrs

Instructions to the Candidates :

1. This question paper consists of Question from :-
 - a) General Awareness And General Knowledge
 - b) Arithmetic
 - c) General Intelligence & Reasoning
 - d) Technical Ability
2. There is no requirement of calculators.
3. No negative marking.
4. Answer all the questions.
5. Write all answers in supplied answer booklet only.
6. Nothing shall be written in the question paper.
7. Ink/Ball point pen only shall be used to write answers. Pencil shall not be used.
8. Each question carries **ONE** mark.

-00000-

1. The minimum compressive strength of 2nd class bricks should be
 - A) 75 Kg/cm²
 - B) 90 Kg/cm²
 - C) 100 Kg/cm²
 - D) 120 Kg/cm²
2. The Kiln which may work throughout the year, is
 - A) Clamp
 - B) Bull's Kiln
 - C) Hoffman's Kiln
 - D) none of these
3. For a rectangular foundation of width b, eccentricity of load should not exceed
 - A) b/2
 - B) b/3
 - C) b/6
 - D) b/5

4. Raft foundation are generally preferred to when the area required for individual footing, is more than

- A) 25% to total area
- B) 30% of total area
- C) 40% of total area
- D) 50% of total area

5. The arrangement made to support an unsafe structure temporarily, is known as

- A) Shoring
- B) scaffolding
- C) Underpinning
- D) Jacking

6. The type of bond in a brick masonry containing alternate courses of stretches and headers, is called

- A) Flemish bond
- B) English bond
- C) Stretcher bond
- D) Header bond

7. A stair should not have pitch more than

- A) 25°
- B) 30°
- C) 40°
- D) 50°

8. In veranda floors outward slope is

- A) 1 in 40
- B) 1 in 50
- C) 1 in 60
- D) 1 in 70

9. Dado is usually provided in

- A) dinning halls
- B) bath rooms
- C) Living rooms
- D) roofs

10. The width of the hollow space between two walls of a cavity wall should not exceed

- A) 5cm
- B) 7.5cm
- C) 10cm
- D) 15cm

11. The angle of intersection of a contour and a ridge line, is

- A) 30°
- B) 45°
- C) 60°
- D) 90°

12. In setting up a plane table in any station

- A) Levelling is done first
- B) Centering is done first
- C) Both levelling and centering are done simultaneously
- D) Orientation is done first

13. The first reading from a level station is

- A) Foresight
- B) intermediate sight
- C) back-sight
- D) any sight

14. In a theodolite

- A) The telescope axis is perpendicular to transit axis
- B) The axis of rotation is perpendicular to transit axis
- C) The telescope axis, the transit axis and the rotation axis pass through the centre of theodolite
- D) All the above

15. For calculating the area enclosed by an irregular boundary we generally use:

- A) Planimeter
- B) Bowditch's rule
- C) Simpson's rule
- D) Trapezoidal rule

16. The length of a Second's pendulum, is

- A) 99.0 cm
- B) 99.4 cm
- C) 100 cm
- D) 101 cm

17. Centrifugal force acting on a body, moving along a circular path will be

- A) Proportional to a centripetal force
- B) Inversely proportional to centripetal force
- C) Equal and similar to centripetal force
- D) Equal and opposite to centripetal force

18. As the elastic limit reaches, tensile strain

- A) Increases more rapidly
- B) Decreases more rapidly
- C) Increases in proportion to the stress
- D) Decreases in proportion to the stress

19. The law which states, "within elastic limits strain produced is proportional to the stress producing it", is known as

- A) Bernoulli's law
- B) stress law
- C) Hooke's law
- D) Poisson's law

20. The distance between the centres of adjacent rivets in the same row, is called

- A) Pitch
- B) Lap
- C) Gauge
- D) Staggered pitch

21. The bending moment is maximum on a section where shearing force

- A) Is maximum
- B) is minimum
- C) is equal
- D) changes sign

22. A beam is said to be of uniform strength, if

- A) B.M is same throughout the beam
- B) Shear stress is same throughout the beam
- C) Deflection is same throughout the beam
- D) Bending stress is same at every section along its longitudinal axis

23. The ratio of the effective length of a column and minimum radius of gyration of its cross-sectional area, is known

- A) Buckling factor
- B) slenderness ratio
- C) Crippling factor
- D) none of these

24. The equivalent length of a column fixed at one end and free at the other end, is

- A) $0.5 l$
- B) $0.7 l$
- C) l
- D) $2 l$

25. Centre of buoyancy is

- A) Centroid of the floating body
- B) Centroid of the fluid displaced
- C) Centre of pressure of the displaced liquid
- D) none of these

26. Bernoulli's equation assumes that

- A) Fluid is non- viscous
- B) Fluid is homogenous
- C) Flow is steady
- D) All the above

27. A triangular notch is preferred to a rectangular notch because

- A) Only one reading is required
- B) Its formula is simple to remember
- C) It gives more accurate results for low discharge
- D) All the above

28. A siphon is used

- A) To connect water reservoirs at different levels intervened by a hill
- B) To supply water to a town from higher level to lower level
- C) To fill up a tank with water at higher level from a lower level
- D) None of these

29. For most economical rectangular section of a channel, the depth is kept

- A) one-fourth of the width
- B) Three times the hydraulic radius
- C) Half the width
- D) None of these

30. Cavitation is caused by

- A) Low pressure
- B) High pressure
- C) Low velocity
- D) High velocity

31. For critical flow, the Froude number is

- A) 1.0
- B) less than 1.0
- C) more than 1.0
- D) 2

32. The rainfall cycle period in India is taken as

- A) 15 years
- B) 20 years
- C) 25 years
- D) 35 years

33. Isohytes are the imaginary lines joining the points of equal

- A) Pressure
- B) Height
- C) Humidity
- D) Rainfall

34. The standard B.O.D of water is taken for

- A) 1 day
- B) 2 days
- C) 3 days
- D) 5 days

35. Primary treatment of sewage consists of removal of

- A) Large suspended organic solids
- B) Oil and grease
- C) Sand and grit
- D) Floating materials

36. The gas evolved in sewers is

- A) Carbon dioxide
- B) Hydrogen sulphide
- C) Methane
- D) all of these

37. Bio-chemical oxygen demand (B.O.D) for the first 20 days is generally referred to

- A) Initial demand
- B) first stage demand
- C) Carbonaceous demand
- D) all of these

38. The liquid waste from kitchens, bath rooms and wash basins, is not called

- A) Liquid waste
- B) sullage
- C) Sewage
- D) none of these

39. Sea water contains less oxygen as compared to fresh river water

- A) 10%
- B) 20%
- C) 30%
- D) none of these

40. The U.C (uniformity coefficient) D_{60}/D_{10} for the best filter media sand should be

- A) 2
- B) 3
- C) 4
- D) 5

41. Soil classification of composite soils, exclusively based on the particle size distribution, is known

- A) Particle classification
- B) Textural classification
- C) High way Research board classification
- D) Unified soil classification

42. The property of soil which permits water to percolate through it, is called

- A) Moisture content
- B) Permeability
- C) Capillarity
- D) none of these

43. If the coefficient of the active pressure K_a is $1/3$, the coefficient of passive pressure K_p , is

- A) $1/3$
- B) $2/3$
- C) 1
- D) 3

44. Negative skin friction on piles

- A) Is caused due to relative settlement of the soil
- B) Is caused in soft clays
- C) Decreases the pile capacity
- D) All of the above

45. Plasticity index is defined as the range of water content between

- A) Liquid and plastic limit
- B) Plastic limit and semi solid limit
- C) Semi-solid limit and liquid limit
- D) Liquid limit and solid limit

46. The water content in a soil sample when it continues to lose weight without losing the volume, is called

- A) Shrinkage limit
- B) Plastic limit
- C) Liquid limit
- D) Semi-solid limit

47. Uniformity coefficient of well graded soil is

- A) 1
- B) less than 2
- C) 2
- D) greater than 2

48. Separation of coarse aggregates from mortar during transportation, is known

- A) Bleeding
- B) creeping
- C) Segregation
- D) shrinkage

49. Vicat's apparatus is used for

- A) Fineness test
- B) consistency test
- C) Setting time test
- D) soundness test

50. In slump test, each layer of concrete is compacted by a steel rod 60cm long and of 16 mm diameter for

- A) 20 times
- B) 25 times
- C) 30 times
- D) 40 times

51. A flaky aggregate is said to be elongated if its length is

- A) Equal to the mean size
- B) Twice the mean size
- C) Thrice the mean size
- D) Four times the mean size

52. Bulking of sand is

- A) Mixing of different sizes of sand particles
- B) Mixing of lime with sand
- C) Mixing of water with sand
- D) Swelling of sand when wetted

53. Concrete gains strength due to

- A) Chemical reaction of cement with sand and coarse aggregation
- B) Evaporation of water from concrete
- C) Hydration of cement
- D) All the above

54. The Le Chatlier test is done for cement to ascertain:

- A) Initial setting time B) Final setting time
- C) Soundness D) Normal consistency

55. Common sugar can be suitably used:

- A) To delay the setting time of concrete
- B) To accelerate the setting time of concrete
- C) To increase the strength of concrete
- D) None of the above

56. In a singly reinforced beam, the effective depth is measured from its compression edge to

- A) Tensile edge
- B) Tensile reinforcement
- C) Neutral axis of the beam
- D) Longitudinal central axis

57. As the percentage of steel increases

- A) Depth of neutral axis decreases
- B) Depth of neutral axis increases
- C) Lever arm increases
- D) Lever arm decreases

58. Spacing of stirrups in a rectangular beam, is

- A) Kept constant throughout the length
- B) Decreased towards the centre of the beam
- C) Increased at the ends
- D) Increased at the centre of beam.

59. If diameter of a reinforcement bar is d , the anchorage value of the hook is

- A) $4d$
- B) $8d$
- C) $12d$
- D) $16d$

60. The weight of a foundation is assumed as

- A) 5% of wall weight
- B) 7% of wall weight
- C) 10% of wall weight
- D) 12% of wall weight

61. The angle of repose of a soil is the maximum angle which the outer face of the soil mass makes

- A) With the horizontal
- B) With the vertical
- C) With the perpendicular to the inclined plane of the soil
- D) None of these

62. The number of treads in a flight is equal to

- A) Risers in the flight
- B) Risers plus one
- C) Risers minus one
- D) None of these

63. If the loading on a prestressed rectangular beam, is uniformly distributed, the tendon to be provided should be

- A) straight below centroidal axis
- B) Parabolic with convexity downward
- C) Parabolic with convexity upward
- D) Straight above centroidal axis

64. An under-reinforced section means

- A) Steel is provided at the under side only
- B) Steel provided is insufficient
- C) Steel provided on one face only
- D) Steel will yield first.

65. An R.C.C. roof slab is designed as a two way slab if

- A) It supports live loads in both directions
- B) The ratio of spans in two directions is less than 2
- C) The slab is continuous over two supports
- D) The slab is discontinuous at edges.

66. The minimum clear cover for R.C.C. columns shall be

- A) Greater of 40mm or diameter
- B) Smaller of 40mm or diameter
- C) Greater of 25mm or diameter
- D) Smaller of 25mm or diameter

67. The maximum area of tension reinforcement in beams shall not exceed

- A) 0.15%
- B) 1.5%
- C) 4%
- D) 1%

68. The distance between the lines of action of compression and tensile forces in a singly reinforced beam is called

- A) Effective depth
- B) Lever arm
- C) Neutral axis
- D) none of these

69. The aspect ratio of slab is:

- A) Ratio of length to breadth
- B) Ratio of breadth and length
- C) Ratio of superimposed load and the self weight
- D) none of these

70. In column design, the tensile strength of concrete is taken

- A) 10% of characteristic strength of concrete
- B) 5% of characteristic strength of concrete
- C) 1% of characteristic strength of concrete
- D) equal to zero

71. Factor of safety is the ratio of

- A) Yield stress to working stress
- B) Tensile stress to working stress
- C) Compressive stress to working stress
- D) Bearing stress to working stress

72. The ratio of longitudinal stress to strain within elastic limit is known as

- A) Modulus of elasticity
- B) Shear modulus of elasticity
- C) Bulk modulus of elasticity
- D) Tangent modulus of elasticity

73. Poisson's ratio for steel within elastic limit ranges from

- A) 0.15 to 0.20
- B) 0.25 to 0.24
- C) 0.25 to 0.33
- D) 0.33 to 0.35

74. The gross diameter of a rivet is the diameter of

- A) Cold rivet before driving
- B) Rivet after driving
- C) Rivet hole
- D) none of these

75. For simply supported beams, the maximum permitted deflection, is

- A) 1/325 of the span
- B) 1/350 of the span
- C) 1/375 of the span
- D) 1/400 of the span

76. The effective length of a weld, is taken as the actual length

- A) Minus the size of weld
- B) Minus twice the size of weld
- C) Plus the size of weld
- D) Plus twice the size of weld

77. A river training work is generally required when the river is

- A) Meandering
- B) Aggrading
- C) Degrading
- D) all the above

78. In water bound macadam roads, binding material, is

- A) Sand
- B) Stone dust
- C) Cement
- D) Brick dust

79. Raising of outer edge of a road with respect to inner edge, is known

- A) Super elevation
- B) Cant
- C) Banking
- D) All the above

80. The minimum value of camber provided for thin bituminous surface hill roads, is

- A) 2.2%
- B) 2.5%
- C) 3.0%
- D) 3.5%

81. Gauge of a permanent way, is

- A) Minimum distance between running faces of rails
- B) Minimum distance between outer faces of rails
- C) Distance between centres of rails
- D) Width of formation

82. Rail section is generally designated by its

- A) Total weight
- B) Total length
- C) Weight per metre length
- D) Area of its cross-section

83. Staggered rail joints are generally provided

- A) On curves
- B) On tangents
- C) On bridges
- D) in tunnels

84. Coning of wheels

- A) Prevent lateral movement of wheels
- B) Provide smooth running of trains
- C) Avoid excessive wear of inner faces of rail
- D) All the above

85. Bending of rails end due to loose packing under a joint and loose fish bolts, is known

- A) Buckling
- B) Hogging
- C) Creeping
- D) None of these

86. Packing of ballast is done

- A) Near the ends of sleepers
- B) On the shoulders
- C) Under sleepers
- D) Between two rails

87. Arrangements made to divert the train from one track to another, is known as

- A) Railway point
- B) Railway crossing
- C) Turnout
- D) Railway junction

88. Frederick W. Taylor introduced a system of working known as

- A) Line organisation
- B) Line and staff organisation
- C) Functional organisation
- D) Effective organisation

89. A dummy activity

- A) Is artificially introduced
- B) Is represented by a dotted line
- C) Does not consume time
- D) All the above

90. The critical activity has

- A) Maximum float
- B) Minimum float
- C) Zero float
- D) none of these

91. Harappan weapons were made of

- (A) Stone
- (B) Copper
- (C) Bronze
- (D) All of the above

92. Which one of the following Vedic God/Godess depicts an association with the Sun ?

- (A) Ashvin
- (B) Pusan
- (C) Indira
- (D) Aranyani

93. Which of the following do not belong to solar system?

- (A) Asteroids
- (B) Comets
- (C) Planets
- (D) Nebulae

94. The surface temperature of the Sun is nearly

- (A) 2000 K
- (B) 4000 K
- (C) 6000 K
- (D) 8000 K

95. Which one of the following is known as the Great Circle?

- (A) Tropic of Cancer
- (B) Tropic of Capricorn
- (C) Equator
- (D) Arctic Circle

96. High spring tides occur at new Moon and full Moon because the

- (A) Moon and Earth are at right angles
- (B) Sun and Moon are at right angles
- (C) Sun, Earth and the Moon are in straight line
- (D) Sun and Earth are at right angles

97. The most important reason for dwindling forest resources today is

- (A) soil erosion
- (B) forest fire
- (C) floods
- (D) over felling

98. Carbon dioxide is called a greenhouse gas because

- (A) its concentration remains always higher than other gases
- (B) it is used in photosynthesis
- (C) it absorbs infrared radiation
- (D) it emits visible radiation

99. It is a well known fact that the maximum temperature of the ocean is always at their surface because

- (A) they directly receive the heat from the Sun
- (B) they directly receive the heat through ocean currents
- (C) Both 'A' and 'B' above
- (D) None of the above

100. Tsunamis are not caused by

- (A) hurricanes
- (B) earthquakes
- (C) undersea landslides
- (D) volcanic eruptions

101. The country that shares longest border with India is

- (A) China
- (B) Bangladesh
- (C) Nepal
- (D) Pakistan

102. Which one of the following countries is not a member of the SAARC ?

- (A) Bangladesh
- (B) Maldives
- (C) Bhutan
- (D) Myanmar

103. The National Chemical Laboratory (India) is located in

- (A) Mumbai
- (B) Bengaluru
- (C) Hyderabad
- (D) Pune

104. In which state is the Rajiv Gandhi National Institute of Youth Development located ?

- (A) Tamilnadu
- (B) Karnataka
- (C) Himachal Pradesh
- (D) Uttarakhand

105. The permanent headquarters of SAARC secretariat is located at

- (A) Kathmandu
- (B) Dhaka
- (C) New Delhi
- (D) Islamabad

106. Where are the Headquarters of the Southern Naval Command located?

- (A) Arakkonam
- (B) Kochi
- (C) Thiruvananthapuram
- (D) Vishakhapattanam

107. Where is Satish Dhawan Space Centre located ?

- (A) Chandipur-on-sea
- (B) Sriharikota
- (C) Thiruvananthapuram
- (D) Thumba

108. When did the United Nations Organisation come into existence ?

- (A) October 24, 1945 (B) October 24, 1943
(C) November 26, 1945 (D) November 26, 1943

109. Ustad Bismillah Khan was an exponent of

- (A) Tabla (B) Shehnai
(C) Sarod (D) Flute

110. Which of the following designation was never held by Dr. Manmohan Singh

- (A) RBI Governor (B) Chief Economic Advisor
(C) Minister of External Affairs (D) Deputy Chairman of Planning Commission

111. Who among the following was a weaver by profession?

- (A) Kabir (B) Ramdas
(C) Ravidas (D) Tukaram

112. Gautam Buddha delivered his first sermon at which of the following places?

- (A) Kushinagar (B) Sarnath
(C) Bodh Gaya (D) Lumbini

113. Which one of the following is the oldest Grand Slam of the World?

- (A) Wimbledon (B) French Open
(C) Australian Open (D) US Open

114. Who wrote 'Akbarnama' ?

- (A) Akbar (B) Birbal
(C) Abul Fazal (D) Bhagawan Das

115. Which one among the following atmospheric gases, filters out most of the ultraviolet radiation of the Sun ?

- (A) Oxygen (B) Nitrogen
(C) Helium (D) Ozone

116. Sum of three consecutive numbers is 333. What is the sum of the last two numbers ?

- (A) 221 (B) 220
(C) 222 (D) 223

117. If $XY=96$ and $3Y=2X$, then the value of X is

- (A) 8 (B) 10
(C) 12 (D) 9

118. The sum of two numbers is 15 and sum of their squares is 113. The numbers are

- (A) 7,8 (B) 6,9
(C) 5,10 (D) 4,11

119. Two poles of heights 10m and 15m are standing on a plane surface. If their feet are 12m apart, then find the distance between their tops ?

- (A) 13m (B) 12m
(C) 12.5m (D) 13.5m

120. In a forest, there are some rabbits and pigeons. They have 20 heads and 48 feet. How many pigeons are there ?

- (A) 4 (B) 16
(C) 6 (D) 8

121. The L.C.M. and H.C.F. of two positive numbers is 400 and 40 respectively. If one of the numbers is 200, what is the other number?

- (A) 80 (B) 50
(C) 60 (D) 70

122. Find the 10th term of the A.P. 2,7,12.....

- (A) 44 (B) 45
(C) 47 (D) 49

123. For what value of k will the succession $8k+4, 6k-2, 2k+7$be an A.P.

- (A) 5 (B) 6
(C) 7.5 (D) 9

124. How many two digit numbers are divisible by 3 ?

- (A) 29 (B) 30
(C) 31 (D) 32

125. If 120 is 20% of a number, then 120% of that number will be

- (A) 20 (B) 120
(C) 480 (D) 720

126. When 75% of a number is added to 75, the result is the same number. The number is

- (A) 150 (B) 300
(C) 100 (D) 450

127. What is 25% of 30% of $\frac{2}{5}$ th of 2000 ?

- (A) 36 (B) 40
(C) 56 (D) 60

128. In a rally of 256 students, boys and girls are in the ratio 9:7. The number of girls are

- (A) 56 (B) 112
(C) 84 (D) 67

129. The sum of two numbers is 40. Their difference is 4. The ratio of the numbers is

- (A) 1:10 (B) 5:6
(C) 11:9 (D) 7:2

130. Two numbers are in the ratio 1:2. If 7 is added to both, their ratio becomes 3:5. Find the greater number.

- (A) 14 (B) 28
(C) 11 (D) 30

131. $X:6 :: 32:24$. The value of X is

- (A) 7 (B) 8
(C) 6 (D) 5

132. Three numbers are in the ratio 3:4:5 and their average is 24. The largest number is

- (A) 10 (B) 15
(C) 45 (D) 30

133. The ratio of Vimal's age and Amala's age is in the ratio 3:5 and their sum of their age is 80 years. The ratio of their ages after 10 years will be

- (A) 2:3 (B) 1:3
(C) 3:5 (D) 2:5

134. The radii of two circles are in the ratio 1:2. What would be ratio of the area of the circles ?

- (A) 7:22 (B) 22:7
(C) 4:1 (D) 1:4

135. The arithmetic average of 10 numbers is 10. If one is added to each number, by how much would the average increase ?

- (A) 11 (B) 10
(C) 1 (D) 0

136. A construction company borrowed Rs.8,50,000 for 5 years at interest rate $1\frac{1}{2}\%$ p.a. How much annual interest, the company had to pay ?

- (A) Rs.63,750 (B) Rs.1,27,500
(C) Rs.12,750 (D) Rs.25,000

137. A train travelling at the speed of 45 km/hr crosses a platform in 15 seconds. What is the length of the train ?

- (A) 130 metres (B) 140 metres
(C) 112 metres (D) Cannot be determined

138. A car travels at the speed of 85 km/hr and reaches its destination in 5 hrs. What is the distance covered by the car ?

- (A) 485 km (B) 325 km
(C) 450 km (D) 425 km

139. Ashok walked 5 metres towards east, took a right turn and walked 10 metres and again he took a right turn and walked 15 metres. Which direction is he facing now ?

- (A) South (B) West
(C) North (D) East

140. A man buys a radio for Rs.1400 and sells it at a loss of 15%. What is the Selling Price of the radio ?

- (A) Rs.1202 (B) Rs.1190
(C) Rs.1160 (D) Rs.1000

141. Select related word from the given alternatives.

Wheat : Cereal :: Water : ?

- (A) Petrol (B) Liquid
(C) Diesel (D) Kerosene

142. Find odd word from the given alternative

- (A) Japanese (B) Swiss
(C) French (D) German

143. Find odd word from the given alternative

- (A) Sun (B) Moon
(C) Sky (D) Star

144. Which is the wrong term in the series ?

25, 36, 49, 81, 121, 169, 225

- (A) 36 (B) 121
(C) 49 (D) 81

145. Choose the missing term from the given alternative, for completing the series

15, 14, 12, 9, 5, 0, ?

- (A) -11 (B) -15
(C) -6 (D) -7

146. Select the related number from the given alternative

841 : 29 :: 289 : ?

- (A) 23 (B) 21
(C) 17 (D) 13

147. Select the related word from the given alternative

Head : Hair :: Hand : ?

- (A) Finger (B) Ear
(C) Neck (D) Knee

148. Select the related word from the given alternative

Walking : Running :: Wind : ?

- (A) Weather (B) Air
(C) Rain (D) Storm

149. 'D' is B's father. B is C's Sister-in-law and A's Daughter. How is A related to D ?

- (A) Wife (B) Mother
(C) Father (D) Husband

150. Select the related word from the given alternative

Hen : Egg :: Tree : ?

- (A) Bark (B) Seed
(C) Leaves (D) Fruit



SOUTHERN RAILWAY

QUESTION PAPER FOR SUSTAINABILITY TEST FOR JUNIOR ENGINEER (ENGINEERING DEPARTMENT)

INSTRUCTIONS TO CANDIDATES

1. All questions carry equal mark.
 2. Attend all questions.
 3. Maximum marks is 150 (150 questions x 1).
 4. No calculator or other similar gadgets are allowed during examination.
 5. Duration of examination – 2 hours.
-

1. If $(x+2)$ is one factor of $4x^2+13x+10$, the other factor is
1) $4x+5$ 2) $5x+4$ 3) $2x+5$ 4) $5x+2$
2. If the difference between the two numbers is 8 and the sum of their squares is 274 the two numbers are
1) 7,15 2) 8,16 3) -7,15 4) -15,7
3. Find the value of $2^3 \times 2^0$
1) 2^6 2) 2^7 3) 2^{12} 4) 2^1
4. The value of $\log_{10} 1000$ is
1) 1 2) 3 3) 2 4) 0
5. If $\log 2 = 0.3010$ then the value of $\log 2^{12}$ is
1) 12.3010 2) 2.3010 3) 6.3010 4) 3.6120
6. Divide Rs.15000 among ABC in the ratio 6:7:2 then A's share is
1) Rs.6000 2) Rs.7000 3) Rs.8000 4) Rs.12000
7. A & B share the profits in the ratio 3:2, if B gets Rs.500, how much does A get
1) Rs.250 2) Rs.200 3) Rs.750 4) Rs.600
8. A dishonest shopkeeper professes to sell pulses at his cost price but uses a false weight of 950 grams for each kilogram. His gain will be
1) 5.26% 2) 6% 3) 5% 4) 4.26%
9. The population of a town increases 10% annually. If its present population is 40,000 find its population after 3 years.
1) 42400 2) 43240 3) 50,280 4) 53240

10. A man purchased 5 horses at the rate of Rs.1200 each. 6 horses at the rate of Rs. 700 each and 9 horses at the rate of Rs.1000 each. Calculate the average cost of one horse.

- 1)Rs.600 2)Rs. 850 ~~3)Rs.960~~ 4)RS.1200

11. Simplify: $16 - \{2 + 6 - \{7 - (3 - 2)\}\}$

- ~~1)16~~ 2)14 3)18 4) 4

12. If $\sqrt{64/25} = x/25$ find the value of x

- 1)20 2) 30 ~~3) 40~~ 4) 60

13. The sum of the present ages of father and son is 90. After ten years, their ages will be in the ratio 13:9. What is the present age of the son

- 1)16 yrs 2) 28 yrs 3)35 yrs ~~4) 40 yrs~~

14. Find the value of x, if $x^2 - x - 2 = 0$

- 1)1 2)2 ~~3)-2~~ 4) 0

15. Find the circumference of a circle whose area is 314 cm^2 ($\pi=3.14$)

- 1)62.8 cm 2)32.4 cm 3)6.2 cm ~~4)12.8 cm~~

16. A matrix is

- 1)a whole number 2)must contain two elements
~~3)an array of numbers~~ 4) none of these

17. If 60% of $(3/5)$ of a number is 36, then the number is

- 1)80 ~~2)100~~ 3)75 4)90

18. Simplify: $0.2 \times 0.2 + 0.2 \times 0.02 / 0.044$

- 1)0.004 2)0.4 ~~3)1~~ 4)2

19. A boy was asked to write the value of $(2)^5 \times (9)^2$. He wrote it as 2592. The difference between the obtained and the actual value is

- 1) zero 2) 2×9^2 3) $2^2 \times 9^3$ ~~4) $2^3 \times 9^4$~~

20. The number of students in each section of a school is 24. After admitting new students three new sections were started. Now the total number of section is 16 and there are 21 students in each section. The number of new students admitted is:
- 1)14 2)24 3)48 4)114
21. The total monthly salary of 4 men and 2 women is Rs. 46,000. If a women earns Rs. 500 more than a man what the monthly salary of a woman?
- 1)Rs.6500 2)Rs.7500 3)Rs. 8000 4)Rs.9000
22. The number of girls in a class is 5 times the number of boys. Which of the following cannot be the total number of children in the class?
- ~~1)24~~ 2)30 3)35 4)42 5)54
23. The average age of husband, wife and child 3 years ago was 27 years and that of wife and the child 5 years ago was 20 years. The present age of the husband is:
- 1)35 years 2)40 years 3)50 years 4)None of these
24. Sachin is younger than Rahul by 4 years. If their ages are in the respective ratio of 7:9 how old is Sachin?
- 1)16 years 2)18 years 3)28 years
- 4)cannot be determined 5)none of these
25. 63% of $3\frac{4}{7}$ is
- 1)2.25 2)2.40 3)2.50 d)2.75
26. A pipe which is installed in the house drainage to preserve the water seal of traps is called -
- (1) vent pipe (2) antisiphonage pipe (3) waste pipe ~~(4) soil pipe~~
27. An example of igneous basic rock is
- 1) granite 2) basalt 3) gneiss ~~4) marble~~
28. Plywood is specified by
- 1) weight 2) volume ~~3) thickness~~ 4) number of layers

29. Telegraph and electric poles are sometimes tied down by inclined stay wires. The stay wires are meant to
- 1) provide a vertical force to the post
 - 2) add to the tensile strength of the post
 - 3) Provide a horizontal component to balance the pull of the telegraphic or electric wires
 - 4) both (2) and (3)
30. The number of bricks required to construct one meter height of wall of 230 mm thick, for a rectangular room with centre line measurement as 3 m x 4 m at the rate of 500 bricks per cubic meter is
- 1) 1690 No.
 - 2) 2070 No.
 - 3) 1610 No.
 - 4) None of the above
31. A drafter helps in drawing
- 1) parallel and perpendicular lines
 - 2) concentric circles
 - 3) smooth curves
 - 4) All the above
32. A 30 m metric chain is found to be 0.1 m too short throughout the measurement. If the distance measured is recorded as 300 m then the actual distance will be
- 1) 300.1 m
 - 2) 501.0 m
 - 3) 299.0 m
 - 4) 310.0 m
33. Angle of dip at pole is
- 1) 0°
 - 2) 90°
 - 3) 45°
 - 4) 30°
34. A dumpy level is set up with its eyepiece vertically over a peg A. The height from the top of peg A to the centre of the eyepiece is 1.540 m and the reading on peg B is 0.705 m. The level is then set up over peg B. The height of the eyepiece above peg B is 1.490 m and the reading on A is 2.195 m. The difference in level between A and B is
- 1) 2.900 m
 - 2) 3.030 m
 - 3) 0.770 m
 - 4) 0.785 m
35. To find the R.L of a roof slab of a building, staff readings were taken from a particular set-up of the levelling instrument. The readings were 1.050 m with staff on the Bench Mark and 2.300 m with staff below the roof slab and held inverted. Taking the R.L of the B.M as 135.150 m, the R.L of the roof slab will be
- 1) 129.800
 - 2) 131.900
 - 3) 134.400
 - 4) 138.500

36. If spiral angle is ϕ the total deflection angle of a transition curve is given by
- 1) $\phi/4$ 2) $\phi/3$ 3) $\phi/2$ 4) 2ϕ
37. Shift of a transition curve is given by
- 1) $L^2/24R$ 2) gv^2/GR 3) Rg/Gv^2 4) $1718.9(R/s)$
38. If R is the radius of the main curve, ϕ the angle of deflection, S the shift and L the length of the transition curve, then the total tangent length of the curve is given by
- 1) $(R-S) \tan \phi/2 - L/2$ 2) $(R+S) \tan \phi/2 - L/2$
 3) $(R+S) \tan \phi/2 + L/2$ 4) $(R-S) \tan \phi/2 + L/2$
39. A good brick, when immersed in water bath for 24 hours, should not absorb water more than
- (1) 20% of its dry weight (2) 30% of its saturated weight
 (3) 10% of its dry weight (4) 20% of its saturated weight
40. In levelling, height of instrument is
- 1) The height of telescope above the ground at the time of observation
 2) The height of levelling staff
 3) The elevation of plane of collimation
 4) The sum of the reduced level of B.M and foresight
41. Stone is placed along its natural bed so that the applied load is
- (1) parallel to it 2) normal to it 3) at 45° to it 4) at 60° to it
42. The most important purpose of frog in a brick is to
- 1) emboss manufacturer's name
 2) reduce the weight of brick
 3) form keyed joint between brick and mortar
 4) improve insulation by providing hollows.
43. Efflorescence of bricks is due to
- 1) soluble salts pressed in clay for making bricks 2) High porosity of bricks
 3) High slit content in brick earth 4) Excessive burning of bricks

44. Finer the cement more is the
- 1) early strength
 - 2) workability
 - 3) shrinkage cracking
 - 4) all of the above
45. Superplasticizer in cement concrete
- 1) imparts extreme workability
 - 2) reduces amount of water to be added
 - 3) improves bonding properties
 - 4) both (1) and (2)
46. Which is not a function of paint?
- 1) It protects the surface against possible mechanical and chemical stresses
 - 2) It checks the formation of bacteria and fungus
 - 3) It checks the decay of wood work
 - 4) It checks the defects in timber
47. Glass wool is used as a
- 1) sound absorbing material
 - 2) heat insulating material
 - 3) damp proofing material
 - 4) both (1) and (2)
48. Bureau of Indian Standards classifies bitumen into grades 65/25, 85/40 etc. The first and second numbers respectively refer to
- 1) softening point and penetration
 - 2) penetration and softening point
 - 3) flash point and penetration
 - 4) flash point and softening point
49. For RCC sections with congested reinforcement the compaction factor is
- 1) 0.8
 - 2) 0.87
 - 3) 0.92
 - 4) 0.95

50. The ratio of 28 day strength of cube to that of a standard cylinder is
1)0.8 2)1.25 3)0.67 4)2.00
51. The pH value of water for quality concrete shall not be less than
1)2 2)4 3)6 4)12
52. Three cubes of concrete were tested for compressive strength. The test results are acceptable only if the individual variation is
1)not more than $\pm 15\%$ of average
2)not more than $\pm 5\%$ of characteristics strength
3)not more than 5% of average
4)not more than 7% of average
53. In hand mixed concrete, same strength of concrete can be achieved as that by concrete compacted with vibrator by
1)adding 10% more cement
2)adding 10% less cement
3)increasing fineness modules of sand
4)cannot be achieved by any way
54. Steam curing, accelerates attainment of strength in concrete because
1)more water is available for curing 2)rapid hardening occurs
3)hydration of cement is faster 4)it alters the setting time
55. Steam curing is preferably used for
1)columns 2)beams
3)mass concreting 4) mass production of precast units
56. By entrapped air into cement concrete
1)workability is decreased
2)strength is decreased
3)both workability and strength are increased
4)both workability and strength are decreased

57. Spalling of cement plaster occurs on walls because of bad quality of
1)bricks 2)cement 3)sand 4)water
58. When reinforcement gets rusted the concrete cover spalls because
1)volume of rust is more than reinforcement
2)bond between concrete and steel is lost
3)cover is too thin as compared to size of structure
4)cover contains less coarse aggregate
59. The tapering steps provided to change the direction of a stair are known as
1)scotia 2)flinders 3)winders 4)stringers
60. Construction of temporary structure to support an unsafe structure is known as
1)shoring 2)underpinning 3)scaffolding 4)formwork
61. The function of coping is to serve as a
1)covering to the wall to throw of water
2)ornamental course between lintel level and roof level
3)projection from a wall to support a structure member
4)shade against solar radiation
62. In building construction, the place for providing damp proof course is at the
1)basement level 2>window sill level 3)lintel level 4)roof level
63. Milestones are
1)activity versus time 2)activities
3)beginning of various activities 4)vertical bar chart
64. Total float in CPM is
1)maximum available time over the activity time
2)difference of maximum time available and the actual time required for an activity
3)minimum available time over the activity time
4)both (1) and (2)

74. The rails that are used on Indian Railways nowadays are
 (1) Bull headed (2) Double-headed (3) Flat-footed (4) Cast iron
75. A symmetrical channel section is made of a material which is equally strong in tension and compression. It is used as a simply supported beam with its web horizontal to carry vertical loads. It will
 1) be strongest if the web is used as top face
 2) be strongest if the web is used as bottom face
 3) be equally strong in (1) and (2) above
 4) not be possible to state which of the above statements is correct.
76. The neutral axis is a section
 1) at the centroidal axis
 2) at the middle axis
 3) where the strain changes its sign
 4) where the principal stress is zero
77. The bending stress in an I-section beam is maximum
 1) at the extreme fibre of the section
 2) at the junction of web and flange
 3) at the neutral axis
 4) none of the above
78. Which of the column has the least effective length?
 1) both ends fixed
 2) both ends hinged
 3) one end fixed and the other one free
 4) one end fixed and the other one hinged
79. The value of modular ratio for concrete can be obtained by
 1) $280/3 \sqrt{\sigma_{cbc}}$ 2) $100/\sqrt{\sigma_{cbc}}$ 3) $140 \sqrt{\sigma_{cbc}}$ 4) $100 \sqrt{\sigma_{cbc}}$

80. A plan of an area drawn with the original scale of 1 cm = 10 m, has shrunk such that a line, originally 15 cm long on the plan, measures now, 14.5 cm. The shrunk scale is give by 1 cm equal to
- (1) 0.97 m (2) 9.70 m (3) 10.34 m (4) 10.97 m
81. A particular grade of steel is termed as Fe-415 when its value of
- 1) permissible stress is 415 N/mm^2 2) yield stress is 415 N/mm^2
 3) ultimate stress is 415 N/mm^2 4) characteristics strength is 415 N/mm^2
82. As per IS:456-2000, the ratio of stress in concrete to its characteristic strength at collapse in flexure for design purpose is taken
- 1) 0.67 2) 0.576 3) 0.447 4) 0.138
83. Disinfection of water is done for
- (1) turbidity removal (2) hardness removal
 (3) Killing of pathogens (4) fluoride removal
84. The trap used for a water closet is called
- (1) gully trap (2) p-trap (3) intercepting trap. (4) anti-siphon trap.
85. A deep beam has ratio of effective span to depth as
- 1) 7 2) 20 3) 26 4) less than 2
86. The minimum area of tension reinforcement in a beam expressed as percent of cross sectional area is
- 1) $0.85/f_y$ 2) $85/f_y$ 3) 4% 4) none of the above
87. The maximum spacing of shear reinforcement in the form of vertical stirrups shall not exceed
- 1) $0.3d$ 2) $0.5d$ 3) $0.75d$ 4) $2.0d$
- Where d is the effective depth of RCC section.
88. A bar is bent through an angle of 90° . Its anchorage value is
- 1) zero 2) 4 times diameter
 3) 16 times diameter 4) 20 times diameter

89. In limit state design full design yield strength $0.87 f_y$ is assumed to correspond to a proof strain of
- 1)0.0035 2)0.00035 3)0.0002 4)0.002
90. To design a column, one should normally start by assuming the area of steel as
- 1)1% 2)0.15% 3)zero 4)3%
91. A reinforced concrete slab is 75 mm thick. The maximum size of reinforcement bar that can be used is
- 1)12 mm diameter 2)10 mm diameter
2)8 mm diameter 4) 6 mm diameter
92. The reinforcement for positive moment in a continuous one way slab can be curtailed from the continuous edge at a distance of
- 1)0.25L 2)0.15L 3)0.3L 4)0.4L
93. In slabs the maximum distance between reinforcement bars in tension should not be more than
- 1) 5 times effective depth
2)same as effective depth
3)200 mm
4)lesser of 3 times effective depth or 300 mm
94. In a single span simply supported beam, the positive moment reinforcement that should not be curtailed, and continued into the support along the same side is
- 1)at least one-third 2)maximum one-third
3)at least one-fourth 4)maximum one-fourth
95. In beams, the minimum distance between reinforcing bars in tension should be kept 5 mm more than
- 1)diameter of bar
2)maximum size of coarse aggregate
3)maximum size of fine aggregate
4)diameter of bar plus maximum size of fine aggregate

96. Effective cover in tension reinforcement is measured from
- 1) bottom of reinforcing bar
 - 2) centre of compression steel
 - 3) top of beam
 - 4) centre of tension steel
97. Lateral ties in RC columns are provided to resist
- 1) bending moment
 - 2) shear
 - 3) buckling of longitudinal steel bars
 - 4) both bending moment and shear
98. Which of the following member should have maximum cover?
- 1) Interior column in a building
 - 2) exterior column in a building
 - 3) column partly submerged in sea water
 - 4) column fully submerged in sea water
99. If a column has more cross-sectional area than that required to carry the load, then minimum per cent of steel is calculated based on
- 1) actual area
 - 2) area required to carry the load
 - 3) area excluding clear cover
 - 4) none of the above
100. If the spacing of the ties is kept more than that specified by the IS code then
- 1) ties will fail on application of load
 - 2) concrete cover is likely to spall
 - 3) slenderness ratio of column will change
 - 4) main reinforcement will have to be increased.

101. Which of the following is generally not designed for shear?
- 1) A slab
 - 2) A cantilever beam
 - 3) A footing
 - 4) None of the above
102. The critical section for calculating bending moment in a footing supporting a column is taken at
- 1) face of the column
 - 2) a distance "d" from the face of column
 - 3) the edge of the footing
 - 4) a distance "d" from the centre of column
103. The bottom plug in well foundation is used
- 1) to seal off the water
 - 2) for check seating
 - 3) to transfer load from the straining to the soil
 - 4) to create a working space in the well
104. In a counterfort type retaining wall, the toe can be designed as a cantilever, if
- 1) size of front and rear counterforts is the same
 - 2) front counterforts are absent
 - 3) rear counterforts are absent
 - 4) soft soil is encountered
105. A retaining wall can overturn if the resultant of the earth pressure and weight of wall strikes the base at
- 1) middle third of the base width
 - 2) middle half of the base width
 - 3) outer third of the base width
 - 4) toe of the wall

106. A key is needed in retaining wall
- 1) if adequate factor of safety against sliding is not available
 - 2) to reduce the thickness of stem subjected to high bending moments
 - 3) when tension develops at the wall base
 - 4) in all the above cases
107. A counterfort retaining wall is preferred over the cantilever type when
- 1) height of wall is more
 - 2) tension develops at the wall base
 - 3) adequate factor of safety against turning is not available
 - 4) none of the above
108. The counterforts in retaining walls may be provided on
- 1) the side of retained earth
 - 2) the front of the wall and not on the soil side
 - 3) any side of the retaining wall
 - 4) partition wall
109. A tracked vehicle of 70t load or a wheel load of 100 t is classes as
- 1) IRC class AA loading
 - 2) IRC class A loading
 - 3) IRC class B loading
 - 4) IRC class 70 R loading
110. If the loading on a simply supported prestressed concrete beam is uniformly distributed, the centroid of tendons shall be preferably
- 1) a straight profile along the centroidal axis
 - 2) a straight profile along with the lower kern
 - 3) a parabolic profile with convexity downward
 - 4) a circular profile with convexity upward

111. In Railway terminology a two-degree curve has radius of about
(1)1750 m (2)1240 m (3)1000 m (4)875m.
112. The loss of prestress due to wobbling effect is because
1)of curvature of duct
2)of friction met within a straight tendon due to slight imperfections of the duct
3)the anchorage fixtures are themselves subjected to a stretch
4)of creep of concrete
113. Purlins can be designed economically
1)by assuming all the loads normal to the roof truss
2)by fixing them with rafters
3)by providing sag rods
4)all the above.
114. If sand boiling is observed during sinking operations of a well, the immediate remedial measure is
(1)to expedite sinking operations
(2)to pump water into well
(3)to pump out water from well
(4)to allow drivers to go into well to ascertain the cause.
115. The flow of water in wash hand basin when it is being emptied through a central opening, is an example of
(1)free vortex (2)forced vortex
(3)rotational vortex (4)Rankine vortex.
116. How many such letters are there in the word TIGER which remain same in its position, if the letters are arranged in ascending order alphabetically?
(1) None (2) One (3) Two (4) Three

124. Eighth BRICS Summit is hosted by
(1) India (2) Brazil (3) China (4) Russia.
125. The recent military strike undertaken by Indian Army against the Pakistan is popularly termed as
(1) Tactical Strike
(2) Neuclear Strike
(3) Surgical Strike
(4) Atomic Strike.
126. In Para Olympic, Mariyappan Thangavelu won gold medal in
(1) Running (2) High Jump
(3) Shot put (4) None of the above.
127. The gas used to extinguish fire is
(1) Neon (2) Nitrogen (3) Carbon dioxide (4) Carbon monoxide
128. What is laughing gas?
(1) Carbon dioxide (2) Sulphur dioxide (3) Hydrogen peroxide
(4) Nitrous oxide (5) Carbon monoxide.
129. The filament of an electric bulb is made of
(1) iron (2) nichrome (3) tungsten (4) graphite.
130. Galvanised iron sheets have a coating of
(1) tin (2) lead (3) zinc (4) chromium.
131. How many colours the sunlight spectrum has?
(1) Five (2) Three (3) Seven (4) four (5) Nine.
132. Atom Bomb is based on the principle of
(1) nuclear fusion (2) Nuclear fission (3) Both (1)&(2) (4) None of these.
133. Optic fibres are mainly used for which of the following?
(1) Communication (2) Weaving (3) Musical instruments.
(4) Food industry (5) Eye surgery.

134. Detergents used for cleaning clothes and utensils contain
(1) nitrates (2) bicarbonates (3) sulphonates (4) bismuthates
135. Rusting of iron involves
(1) Oxidation (2) reduction (3) decomposition (4) displacement.
136. Photosynthesis is
(1) an exothermic process
(2) an endothermic process
(3) a neutral process
(4) a thermostatic process
137. Decibel is the unit used for
(1) Speed of light (2) intensity of heat
(3) intensity of sound (4) radio wave frequency.
138. Safety wire used in domestic electrical appliances is made of a metal of
(1) Low melting point (2) low specific gravity
(3) low resistance (4) None of the above.
139. Fish plates in railway track are used
(1) to join two coaches (2) to connect two rails.
(3) to guide the wheels of coach (4) both (b) & (c) above.
140. The lightning conductor used in building, protects the building by
(1) dissipating the electric charge away from the building.
(2) conducting the lightning safely to the ground.
(3) absorbing the electric charge
(4) None of these.
141. Hardware is related to
(1) calculator (2) computers (3) acids (4) heavy metals.

142. Distant objects can be seen with the help of
(1) chronometer (2) microscope (3) telescope (4) spectroscope.
143. Which of the following is not a gland?
(1) Stomach (2) Liver (3) Kidney (4) Pancreas.
144. For transfusion, the 'O' blood group of a donor can be accepted by a person having blood group
(1) A (2) B (3) AB (4) All of these
145. Heart attack occurs due to
(1) bacterial attack on the heart
(2) stopping of heart beat
(3) lack of blood supply to the heart itself
(4) impairment of heart's working due to unknown reasons.
146. The water in an open pond remains cool even in hot summer because
(1) of continuous evaporation of water
(2) water radiates heat more rapidly than the atmosphere
(3) water absorbs heat less rapidly than the atmosphere.
(4) none of these.
147. Oil rises up the wick in a lamp because
(1) oil is very light (2) of the diffusion of oil through the wick
(3) oil is volatile (4) of the surface tension phenomenon
(5) of the capillary action phenomenon.
148. Small liquid drops are spherical in shape because
(1) of adhesion
(2) of gravitational force
(3) of the atmospheric pressure from all the sides on the top.
(4) the liquid tends to have minimum surface area due to surface tension.

149. Railway tracks are Raised/banked on curves so that

- (1) the train may not fall down inwards
- (2) necessary centrifugal force may be obtained from the horizontal component of the weight of the train.
- (3) no frictional force may be produced between the track and the wheels.
- (4) the weight of the train may be reduced.

150. Ministry of External affairs in India is headed by

- (1) Shri Ravi shankar Prasad
- (2) Ms. Smriti Zubin Irani
- (3) Shri Suresh Prabhu
- (4) Ms. Sushma Swaraj



SOUTHERN RAILWAY

APTITUDE TEST FOR JUNIOR ENGINEER (ENGINEERING DEPARTMENT)

Instructions to Candidates

- Answer all Questions
- All Questions carry equal marks & No negative marks for wrong answer
- Calculator or any other electronic devices are not allowed

Maximum Marks: 150 x 1 = 150

Duration: Two hours

- 1) Chief Minister of which state has decided to present a separate agriculture budget for the state from next year?
 - A. Telangana
 - B. Andhra Pradesh
 - C. Bihar
 - D. Jharkhand
 - E. Chhattisgarh
- 2) 'National Doctor's Day' is celebrated in India on which date every year?
 - A. July 1
 - B. July 2
 - C. July 3
 - D. July 4
 - E. July 5
- 3) As per the amended Legal Metrology rules for packaged commodities, which will come into effect from _____, the Centre has clarified that the retail sale price shall be the Maximum Retail Price (MRP) inclusive of all taxes.
 - A. September 1, 2017
 - B. October 1, 2017
 - C. November 1, 2017
 - D. December 1, 2017
 - E. January 1, 2018
- 4) Retirement fund body EPFO has inked pacts with five banks for collections of provident dues and to make retirement payments. Which among the following is NOT one of the five banks?
 - A. ICICI Bank
 - B. Axis Bank
 - C. Kotak Mahindra Bank
 - D. Bank of Baroda
 - E. State Bank of India

- 5) India's first university, only for Dalit students will come up in which city by 2018?
- A. Patna
 - B. Pune
 - C. Kanpur
 - D. Bhopal
 - E. Hyderabad
- 6) Who among the following has been appointed as Director General of Goods and Services Tax Intelligence (DG GSTI)?
- A. William Francis
 - B. John Joseph
 - C. Robert Fernandes
 - D. Alfred Gomez
 - E. Peter Gomes
- 7) The government has merged the Urban Development and Housing and Urban Poverty Alleviation Ministries. The merged ministry will now be known as:
- A. Ministry of Affordable Housing and Poverty Alleviation
 - B. Ministry of Housing and Urban Affairs
 - C. Ministry of Housing and Urban Revival
 - D. Ministry of Affordable Housing and Urban Affairs
 - E. Ministry of Housing Assistance and Urban Development
- 8) Which country topped the medals tally at 2017 Asian Athletics Championships?
- A. China
 - B. Kazakhstan
 - C. India
 - D. Vietnam
 - E. Iran
- 9) On July 10, 2017, which among the following became the second state to launch e-RTI portal that will enable citizens to file online Right to Information (RTI)?
- A. Delhi
 - B. Madhya Pradesh
 - C. Himachal Pradesh
 - D. Sikkim
 - E. Manipur
- 10) What was the theme of 'World Population Day 2017' observed on July 11, 2017?
- A. 'Sustainable Population Growth.
 - B. 'Inclusive Population Growth'
 - C. 'Family Planning: Empowering People, Developing Nations'
 - D. 'Population and Empowerment of Weaker Sections'
 - E. 'Creating Awareness about Family Planning'

- 11) On July 12, 2017 Indian Railways launched _____, a virtual server with an inbuilt security system that will enable faster connectivity at a reduced cost.
- A. RailRAM
 - B. RailCloud
 - C. RailStore
 - D. RailServer
 - E. RailBlock
- 12) Which programme has been launched by Yes Bank to help Micro, Small and Medium Enterprises (MSMEs) understand the impact of the proposed changes and prepare them for migration to the new GST tax system?
- A. 'CLEAR GST'
 - B. 'GST FRIEND'
 - C. 'GST GURU'
 - D. 'GST EXPERT'
 - E. 'YES GST'
- 13) BJP President Amit Shah and RSS Chief Mohan Bhagwat recently released a coffee table book on Prime Minister Narendra Modi's life in New Delhi. The book – 'Making of A Legend', has been compiled by:
- A. Rajat Sharma
 - B. Shekhar Gupta
 - C. Arnab Goswami
 - D. Bindeshwar Pathak
 - E. Rajdepp Sardesai
- 14) World day against child labour
- A. 12 January
 - B. 18 May
 - C. 12 June
 - D. 1 December
 - E. None of the above
- 15) Indian Railways has launched an integrated mobile application to cater to various passenger requirements, including ticket booking, inquiry, on-board cleaning and ordering meal on a single platform. This app is called:
- A. 'Rail SAARTHI'
 - B. 'Rail SEVAK'
 - C. 'Rail MITR'
 - D. 'Rail HUMSAFAR'
 - E. 'Rail SUVIDHA'

- 16) Which among the following railway station in Mumbai has become India's first railway station run by women?
- A. Vashi Railway Station
 - B. Matunga Railway Station
 - C. Kalyan Railway Station
 - D. Bandra Railway Station
 - E. Andheri Railway Station
- 17) 'International Justice Day', is celebrated on which date every year?
- A. 16th July
 - B. 17th July
 - C. 18th July
 - D. 19th July
 - E. 20th July
- 18) On July 19, 2017, Odisha Chief Minister Naveen Patnaik dedicated to the nation the state's longest bridge and named it after:
- A. Rabindranath Tagore
 - B. Mahatma Gandhi
 - C. Jawaharlal Nehru
 - D. Netaji Subhash Chandra Bose
 - E. Biju Patnaik
- 19) "War begins in the minds of men" is a famous Vedic saying. It is stated in:
- A. Atharvaveda
 - B. Mundaka Upanishad
 - C. Samaveda
 - D. Rigveda
 - E. None of the above
- 20) On July 20, 2017, Mr. Ram Nath Kovind was elected as the _____ President of India.
- A. 13th
 - B. 14th
 - C. 15th
 - D. 16th
 - E. 17th
- 21) On July 19, 2017, Reserve Bank of India (RBI) announced that it will shortly issue bank notes of denomination Rs. _____ in Mahatma Gandhi series 2005.
- A. Rs.5
 - B. Rs.10
 - C. Rs.20
 - D. Rs.50
 - E. Rs.100

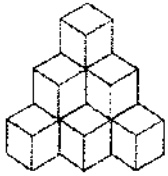
- 22) The Food Safety and Standards Authority of India (FSSAI) has said it is banning the use of stapler pins in tea bags with effect from:
- A. September 1, 2017
 - B. October 1, 2017
 - C. November 1, 2017
 - D. December 1, 2107
 - E. January 1, 2018
- 23) Defence Research and Development Organisation (DRDO) has developed and unmanned, remotely operated tank named:
- A. 'Alpha'
 - B. 'Muntra'
 - C. 'Rudra'
 - D. 'Vraj'
 - E. 'Trishul'
- 24) On July 27, 2017, Government launched which apps for dissemination of earthquake parameters to the user community in timely manner for their safety.
- A. 'India Sandesh'
 - B. 'India Quake'
 - C. 'India Tectonic'
 - D. 'India Richter'
 - E. 'India Quartz'
- 25) Which Indian city has ranked 40th out of 50 cities on Women Entrepreneur (WE) Cities Index 2017 that ranks cities in terms of its ability to attract and foster growth of women – owned firms?
- A. Mumbai
 - B. Delhi
 - C. Benglauru
 - D. Chennai
 - E. Ahmedabad
26. $0.003 \times 0.02 = ?$
- A. 0.06
 - B. 0.006
 - C. 0.0006
 - D. 0.00006
 - E. None of the above

27. If A completes a particular work in 8 days and B the same work in 24 days. How many days will it take if they work together?
- A. 4
 - B. 5
 - C. 6
 - D. 7
 - E. None of the above
28. What comes next in the sequence: 1, 3, 11, 43, _____?
- A. 161
 - B. 171
 - C. 181
 - D. 191
 - E. None of the above
29. 9, 12, 11, 14, 13, ?, 15
- A. 12
 - B. 16
 - C. 10
 - D. 17
 - E. None of the above
30. A train 140 m long is running at 60kmph. In how much time will it pass a platform 260 m long?
- A. 15 seconds
 - B. 24 seconds
 - C. 28 seconds
 - D. 30 seconds
 - E. None of the above
31. A train covers a distance in 50 min, if it runs at a speed of 48kmph on an average. The speed at which the train must run to reduce the time of journey to 40min will be
- A. 45 kmph
 - B. 60 kmph
 - C. 55 kmph
 - D. 70 kmph
 - E. None of the above
32. The ratio between the speeds of the A & B is 2:3, and therefore A takes 10 min more than the time taken by B to reach the destination. If A had walked at double the speed, he would have covered the distance in
- A. 8 min
 - B. 12 min
 - C. 15 min
 - D. 18 min
 - E. None of the above

33. The ratio between the speeds of two trains is 7 : 8. If the second train runs 400 kms in 4 hours, then the speed of the first train is:
- A. 70 km/hr
 - B. 75 km/hr
 - C. 84 km/hr
 - D. 87.5 km/hr
 - E. None of the above
34. A train 150 m long is running at a speed of 68 kmph. How long does it take to pass a man who is running at 8 kmph in the same direction as the train?
- A. 5 sec
 - B. 9 sec
 - C. 12 sec
 - D. 15 sec
 - E. None of the above
35. A man sitting in a train which is travelling at 50 kmph observes that a goods train, travelling in opposite direction, takes 9 seconds to pass him. If the goods train is 280 m long, find its speed.?
- A. 50 kmph
 - B. 58 kmph
 - C. 62 kmph
 - D. 65 kmph
 - E. None of the above
36. If 5 women or 8 girls can do a work in 84 days. In how many days can 10 women and 5 girls can do the same work?
- A. 32 days
 - B. 48 days
 - C. 52 days
 - D. 38 days
 - E. None of the above
37. A and B are working on an assignment. A takes 6 hours to type 32 pages on a computer, while B takes 5 hours to type 40 pages. How much time will they take, working together on two different computers to type an assignment of 110 pages?
- A. 5 hours
 - B. 6 hours
 - C. 7 hours
 - D. 8 hours
 - E. None of the above
38. If 30% of a number is 12.6, find the number?
- A. 45
 - B. 38
 - C. 40
 - D. 42
 - E. None of the above

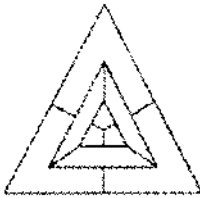
39. A student is ranked 13th from right and 8th from left. How many students are there in total?
- A. 18
 - B. 19
 - C. 20
 - D. 21
 - E. None of the above
40. A goat is tied to one corner of a square plot of side 12m by a rope 7m long. Find the area it can graze?
- A. 155 sq.m
 - B. 19.25 sq.m
 - C. 144 sq.m
 - D. 38.5 sq.m
 - E. None of the above
41. Speed of a boat in still water is 9 km/hr. It goes 12 km downstream and comes back to the starting point in three hours. What is the speed of water in the stream?
- A. 3.5 km/hr
 - B. 3 km/hr
 - C. 5 km/hr
 - D. 5.5 km/hr
 - E. None of the above
42. The perimeter of a rectangular field is 480 meters and the ratio between the length and breadth is 5:3. The area of the field is
- A. 11,500 m²
 - B. 12,500 m²
 - C. 13,500 m²
 - D. 14,500 m²
 - E. None of the above
43. A school has enough food for 400 children for 12 days. How long will the food last if 80 more children join them?
- A. 7 days
 - B. 8 days
 - C. 9 days
 - D. 10 days
 - E. None of the above
44. A candidate appearing for an examination has to secure 40% marks to pass paper I. But he secured only 40 marks and failed by 20 marks. What is the maximum mark for paper I?
- A. 100
 - B. 150
 - C. 180
 - D. 200
 - E. None of the above

45. When you reverse the digits of age of father, you will get the age of son. One year ago the age of father was twice that of son's age. What are the current ages of father and son?
- A. 73 and 37
 - B. 45 and 54
 - C. 31 and 13
 - D. 24 and 42
 - E. None of the above
46. A man on tour travels first 160 km at 64 km/hr and the next 160 km at 80 km/hr. The average speed for the first 320 km of the tour is
- A. 71.11 km/hr
 - B. 36 km/hr
 - C. 71 km/hr
 - D. 36.33 km/hr
 - E. None of the above
47. What is the sum of two consecutive even numbers, the difference of whose squares is 84?
- A. 32
 - B. 34
 - C. 38
 - D. 42
 - E. None of the above
48. Three numbers are in the ratio of 3: 4 :5 respectively. If the sum of the first and third numbers is more than the second number by 52, then which will be the largest number?
- A. 52
 - B. 65
 - C. 67
 - D. 72
 - E. None of the above
49. If the fractions $\frac{8}{5}$, $\frac{7}{2}$, $\frac{9}{5}$, $\frac{5}{4}$, $\frac{4}{5}$ are arranged in descending order of their values, which one will be fourth?
- A. $\frac{9}{5}$
 - B. $\frac{4}{5}$
 - C. $\frac{5}{4}$
 - D. $\frac{8}{5}$
 - E. None of the above
50. What is 50% of 40% of Rs. 3,450?
- A. Rs. 690
 - B. Rs. 580
 - C. Rs. 670
 - D. Rs. 570
 - E. None of the above



51. How many cubes are there in the figure ?

- A. 9
- B. 7
- C. 8
- D. 10
- E. None of the above



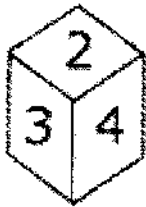
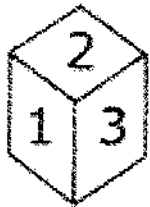
52. What is the minimum number of colours required to fill the spaces in the following diagram without the adjacent sides having the same colour ?

- A. 3
- B. 4
- C. 6
- D. Can not be determined



53. How many triangles are there in the diagram

- A. 8
- B. 4
- C. 10
- D. 16
- E. None of the above



54. The number which is opposite to side 3 is

- A. 4
- B. 5
- C. 6
- D. 2
- E. None of the above

55. 2.09 can be expressed in terms of percentage as
- 2.09 %
 - 20.9%
 - 209%
 - 0.209%
 - None of the above
56. Evaluate 28% of $450 - 45\%$ of 280
- 232
 - 242
 - 252
 - 262
 - None of the above
57. Arrange fractions in descending order
- $\frac{9}{11} > \frac{8}{9} > \frac{3}{5} > \frac{4}{7}$
 - $\frac{9}{11} > \frac{8}{9} > \frac{4}{7} > \frac{3}{5}$
 - $\frac{8}{9} > \frac{9}{11} > \frac{3}{5} > \frac{4}{7}$
 - $\frac{9}{11} > \frac{3}{5} > \frac{8}{9} > \frac{4}{7}$
 - None of the above
58. Evaluate : $6202.5 + 620.25 + 62.025 + 6.2025 + .62025$
- 6791.59775
 - 6891.59775
 - 6891.59675
 - 5891.59775
 - None of the above
59. Which is in ascending order
- $\frac{1}{3}, \frac{2}{5}, \frac{3}{5}, \frac{6}{7}$
 - $\frac{2}{5}, \frac{1}{3}, \frac{3}{5}, \frac{6}{7}$
 - $\frac{1}{3}, \frac{2}{5}, \frac{6}{7}, \frac{3}{5}$
 - $\frac{3}{5}, \frac{6}{7}, \frac{1}{3}, \frac{2}{5}$
 - None of the above
60. Evaluate $\sqrt{248 + \sqrt{64}}$
- 14
 - 26
 - 16
 - 36
 - None of the above

61. $|2| + |-2| + (2)^2 + (-2)^2 = ?$

- A. 6
- B. 8
- C. 10
- D. 12

62. If

$$\frac{x}{2} + 4 = \frac{7}{2} \quad \text{then } x = ?$$

- A. -2
- B. -1
- C. 1
- D. 2

63. What comes next in the sequence: 2, 4, 10, 28, ____ ?

- A. 64
- B. 70
- C. 76
- D. 82

64. $106 \times 106 - 94 \times 94 = ?$

- A. 2004
- B. 2400
- C. 1904
- D. 1906

65. Evaluation of $8^3 \times 8^2 \times 8^{-5}$ is

- A. 1
- B. 0
- C. 8
- D. None of these

66. A body of mass 4 kg is accelerated upon by a constant force, travels a distance of 5 m in the first second and a distance of 2 m in the third second. The force acting on the body is

- A. 2 N
- B. 4 N
- C. 6 N
- D. 8 N

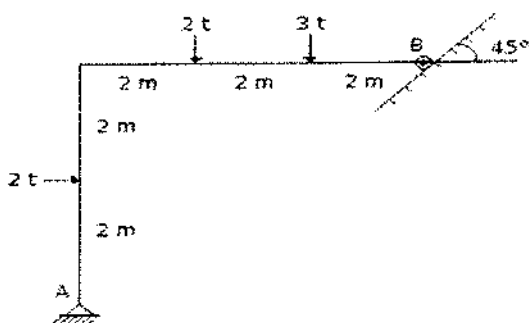
67. A piece of ice is dropped in a vessel containing kerosene. When ice melts, the level of kerosene will

- A. Rise
- B. Fall
- C. Remain same
- D. None of these

68. Young's modulus is the property of
- Gas only
 - Both Solid and Liquid
 - Liquid only
 - Solid only
69. Product of Force and Velocity is called:
- Work
 - Power
 - Energy
 - Momentum
70. Which law is also called the Law of Inertia ?
- Newton's first law
 - Newton's Second Law
 - Newton's Third Law
 - All of these
71. The metallurgical process in which a metal is obtained in a fused state is called
- Smelting
 - Roasting
 - Calcinations
 - Froth floatation
72. The oldest rocks in the earth's crust were once molten, and came from deep inside the earth. The molten rock, called magma, spewed out in volcanic eruptions during the Earth's early life and solidified into hard rock's called
- Granite
 - Basalt
 - Igneous rocks
 - Sedimentary rocks
73. The most commonly used bleaching agent
- Alcohol
 - Carbon dioxide
 - Chlorine
 - Sodium chloride
74. The main use of salt in the diet is to
- make the taste of food better
 - produce in small amounts the hydrochloric acid required for the digestion of food
 - ease the process of cooking
 - increase the solubility of food particles in water
75. The inexpensive and commonly used variety of glass is called soda glass. It is called so because
- was used initially for making bottles of soda(carbonated drink)
 - is made using soda(sodium carbonate)
 - was initially used for storing sodium carbonate
 - is made using soda lime

76. This type of structural steel drawing shows all dimensions necessary for fabrication:
- Shop drawings
 - Design drawings
 - Weldment drawings
 - Application drawings
77. This type of weld is the most common in structural steel fabrication:
- Fillet weld
 - Beam weld
 - Rivet weld
 - Structural weld
78. There are two main types of projection:
- Parallel and Orthographic
 - Station-point and Perspective
 - Parallel and Convergent
 - Perspective and Parallel
79. Architectural drafters generally prefer to use _____ drawings to help illustrate 3-dimensional views of a structure.
- Isometric
 - Perspective
 - Orthographic
 - Auxiliary
80. The architectural drafter usually begins a set of working drawings by creating the _____ plan first.
- Foundation
 - floor plan
 - elevations
 - building section

81. The vertical reaction at the support of the structure shown in below figure, is



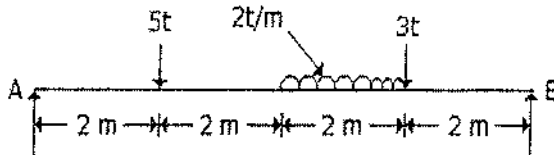
- 1 t
- 2 t
- 3 t
- 3.5 t

82. The ratio of the moment of inertia of a rectangle about its centroidal axis to the moment of inertia about its base, is
- 1/4
 - 1/2
 - 3/4
 - 2

83. The angular speed of a car taking a circular turn of radius 100 m at 36 km/hr will be
- 0.1 rad/sec
 - 1 rad/sec
 - 10 rad/sec
 - 100 rad/sec

84. The force polygon representing a set of forces in equilibrium is a
- Triangle
 - Open polygon
 - Closed polygon
 - Parallelogram

85. The ratio of the reactions R_A and R_B of a simply-supported beam shown in below figure is



- 0.50
 - 0.40
 - 0.67
 - 1.00
86. The portion of the brick cut across its width and having its length equal to that of a full brick, is known as
- Closer
 - Queen closer
 - King closer
 - Prince closer
87. Slump test for concrete is carried out, to determine
- Strength
 - Durability
 - Workability
 - Water content
88. Le-Chatelier's device is used for determining the
- Setting time of cement
 - Soundness of cement
 - Tensile strength of cement
 - Compressive strength of cement

89. Bulking of sand is caused due to
- Surface moisture
 - Air voids
 - Viscosity
 - Clay contents
90. Strength of cement concrete primarily depends upon
- Quality of water
 - Quantity of aggregate
 - Quantity of cement
 - Water-cement ratio
91. The bearing of lines OA and OB are $16^\circ 10'$ and $332^\circ 18'$, the value of the included angle BOA is
- $316^\circ 10'$
 - $158^\circ 28'$
 - $348^\circ 08'$
 - $43^\circ 52'$
92. The back staff reading on a B.M. of R.L. 500.000 m is 2.685 m. If foresight reading on a point is 1.345 m, the reduced level of the point, is
- 502.685 m
 - 501.345 m
 - 501.340 m
 - 504.030 m
93. If V is the speed of a locomotive in km per hour, g is the acceleration due to gravity, G is the distance between running faces of the rails and R is the radius of the circular curve, the required super elevation is
- gV^2/GR
 - Rg/GV^2
 - GR/gV^2
 - GV^2/gR
94. Staff readings on pegs x and y from X station are 1.755 m and 2.850 m, and from station Y on staff head at x and y are 0.655 m and 1.560 m. If reduced level of X is 105.5 m, the reduced level of Y is
- 104.0 m
 - 104.5 m
 - 105.0 m
 - 105.5 m
95. If a tacheometer is fitted with an anallactic lens
- Additive constant is 100, multiplying constant is zero
 - Multiplying constant is 100, additive constant is zero
 - Both multiplying and additive constants are 100
 - Both multiplying and additive constants are 50

96. In the coordinate system of AutoCAD 2008:
- Positive x figures are to the left
 - Positive x figures are to the right
 - Positive x figures are in the direction vertically upwards
 - Positive x figures are in the direction vertically downwards.
97. In AUTOCAD, When using the Rotate tool the angle of rotation is in the following direction:
- Clockwise
 - Anticlockwise
 - The direction in which the cursor is moved
 - There is no fixed rotation direction.
98. When a layer is turned off:
- File space is saved when saving the file
 - It makes no real difference. Details can still be added to the layer
 - Details cannot be erased from the layer
 - Details on the layer cannot be seen.
99. The term UCS stands for:
- User Coordinate State
 - Using Coordinate Screen
 - User Coordinate System
 - User Coordinate Set.
100. The center of gravity of the volume of the liquid displaced by an immersed body is called
- Metacentre
 - Center of pressure
 - Center of buoyancy
 - Center of gravity
101. A piece of wood having weight 5 kg floats in water with 60% of its volume under the liquid. The specific gravity of wood is
- 0.83
 - 0.6
 - 0.4
 - 0.3
102. A square surface 3 m × 3 m lies in a vertical line in water pipe its upper edge at water surface. The hydrostatic force on square surface is
- 9,000 kg
 - 13,500 kg
 - 18,000 kg
 - 27,000 kg
103. The Discharge through a siphon spillway is
- $C_d \times 2gH$
 - $C_d \times a \times g \times H^{3/2}$
 - $C_d \times a \times g \times H^2$
 - $C_d \times a \times g \times H^{5/2}$

104. Density of water is maximum at
- A. 0° C
 - B. 0° K
 - C. 4° C
 - D. 100° C
105. Dimensions of surface tension are
- A. $ML^0 T^{-2}$
 - B. $ML^0 T$
 - C. $ML T^2$
 - D. $ML^0 T^2$
106. Border Roads Organisation for hilly regions (India), was formed in
- A. 1947
 - B. 1954
 - C. 1958
 - D. 1960
107. The tangent length of a simple circular curve of radius R
- A. $R \tan \theta$
 - B. $R \tan \theta/2$
 - C. $R \sin \theta/2$
 - D. $R \sin \theta$
108. While calculating the sight distances, the driver's eye above road surface, is assumed
- A. 90 cm
 - B. 100 cm
 - C. 110 cm
 - D. 120 cm
109. The radius of curvature provided along a transition curve, is
- A. Minimum at the beginning
 - B. Same throughout its length
 - C. Equal to the radius of circular curve
 - D. Varying from infinity to the radius of circular curve
110. The most suitable equipment for compacting clayey soils is a
- A. Smooth wheeled roller
 - B. Pneumatic tyred roller
 - C. Sheep foot roller
 - D. Vibrator
111. Setting out a curve by two theodolite method, involves
- A. Linear measurements only
 - B. Angular measurements only
 - C. Both linear and angular measurements
 - D. None of these

112. The diaphragm of a stadia theodolite is fitted with two additional
- Horizontal hairs
 - Vertical hairs
 - Horizontal and two vertical hairs
 - None of these
113. Tacheometric formula for horizontal distances using horizontal sights can also suitable by suffixing (product by multiplying)
- The constants by $\sin^2 \theta$
 - The constants by $\cos^2 \theta$
 - The constants by $\cos \theta$
 - The multiplying constant by $\cos^2 \theta$ and the additive constant by $\cos \theta$
114. If a tacheometer is fitted with an anallactic lens
- Additive constant is 100, multiplying constant is zero
 - Multiplying constant is 100, additive constant is zero
 - Both multiplying and additive constants are 100
 - Both multiplying and additive constants are 50
115. Pick up the method of surveying in which field observations and plotting proceed simultaneously from the following
- Chain surveying
 - Compass surveying
 - Plan table surveying
 - Tacheometric surveying
116. An under-reinforced section means
- Steel is provided at the underside only
 - Steel provided is insufficient
 - Steel provided on one face only
 - Steel will yield first
117. The percentage of minimum reinforcement of the gross sectional area in slabs, is
- 0.10 %
 - 0.12 %
 - 0.15 %
 - 0.18 %
118. The maximum area of tension reinforcement in beams shall not exceed
- 0.15 %
 - 1.5 %
 - 4 %
 - 1 %
119. In a gusseted base, when the end of the column is machined for complete bearing on the base plate, then the axial load is assumed to be transferred to base plate
- Fully by direct bearing
 - Fully through fastenings
 - 50% by direct bearing and 50% through fastenings
 - 75% by direct bearing and 25% through fastenings

120. Bearing stiffener in a plate girder is used to
- Transfer the load from the top flange to the bottom one
 - Prevent buckling of web
 - Decrease the effective depth of web
 - Prevent excessive deflection
121. Cowl is provided at
- Lower end of ventilating column
 - Upper end of ventilating column
 - Upper end of the manhole
 - First step in manhole
122. If 2% solution of a sewage sample is incubated for 5 days at 20° C and depletion of oxygen was found to be 5 ppm, B.O.D. of the sewage is
- 200 ppm
 - 225 ppm
 - 250 ppm
 - None of these
123. If the depletion of oxygen is found to be 5ppm after incubating a 2.5% solution of sewage sample for 5 days at 21°C, B.O.D. of the sewage is
- 50 ppm
 - 100 ppm
 - 150 ppm
 - 200 ppm
124. Five day B.O.D. at 15°C of the sewage of a town is 100 kg/day. If the 5 day B.O.D. per head at 15°C for standard sewage is 0.1 kg/day, the population equivalent is
- 100
 - 1000
 - 5000
 - 10000
125. A sewer pipe contains 1 mm sand particles of specific gravity 2.65 and 5 mm organic particles of specific gravity 1.2, the minimum velocity required for removing the sewerage, is
- 0.30 m/sec
 - 0.35 m/sec
 - 0.40 m/sec
 - 0.45 m/sec
126. Consider the following statements:
In the critical path method of construction planning, Free Float can be.
- Greater than Total Float.
 - Greater than Independent Float
 - Equal to Total Float.
 - Less than Independent Float. Of these statements
- 1 and 4 are correct
 - 2 and 3 are correct
 - 2 and 4 are correct
 - 1 and 2 are correct

127. The original cost of an equipment is Rs.10,000. Its salvage value at the end of its total useful life of five years is Rs. 1,000. Its book value at the end of two years of its useful life (as per straight line method of evaluation of depreciation) will be

- A. Rs. 8,800
- B. Rs. 7,600
- C. Rs. 6,400
- D. Rs. 5,000

128. The reduction in project time normally results in

- A. Decreasing the direct cost and increasing indirect cost
- B. Increasing the direct cost and decreasing the indirect cost
- C. Increasing the direct cost and indirect cost both
- D. Decreasing the direct cost and indirect cost both

129. Sinking fund is

- A. The fund for rebuilding a structure when its economic life is over
- B. Raised to meet maintenance costs
- C. The total sum to be paid to the municipal authorities by the tenants
- D. A part of the money kept in reserve for providing additional structures and structural modifications

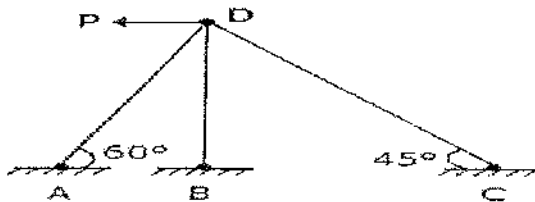
130. Critical path lies along the activities having total float

- A. Positive
- B. Negative
- C. Zero
- D. Same

131. $P = 4 \pi^2 EI/L^2$ is the equation of Euler's crippling load if

- A. Both the ends are fixed
- B. Both the ends are hinged
- C. One end is fixed and other end is free
- D. One end is fixed and other end is hinged

132. The degree of indeterminacy of the frame in the given figure, is

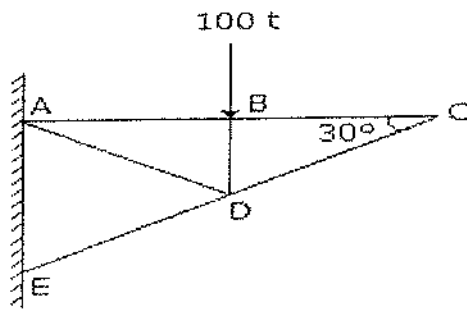


- A. Zero
- B. 1
- C. 2
- D. 3

133. Pick up the incorrect statement from the following: The torsional resistance of a shaft is directly proportional to

- A. Modulus of rigidity
- B. Angle of twist
- C. Reciprocal of the length of the shaft
- D. Moment of inertia of the shaft section

134. In the truss shown in given figure the force in member DC is



- A. 100 t compressive
- B. 100 t tensile
- C. Zero
- D. Indeterminate

135. The equivalent length of a column of length L , having both the ends hinged, is

- A. $2L$
- B. L
- C. $L/2$
- D. L

136. In excel, A function inside another function is called _____

- A. Nested function
- B. Round function
- C. Sum function
- D. Text function

137. Formulas in Excel start with

- A. %
- B. =
- C. +
- D. -

138. Which of the following methods will not enter data in a cell?

- A. Pressing the Esc key
- B. Pressing an arrow key
- C. Pressing the tab key
- D. Clicking the enter button to the formula bar

139. Which function will you use to enter current time in a worksheet cell?

- A) =today()
- B) =now()
- C) =time()
- D) =current Time()

140. When a row of data is to be converted into columns
- A. Copy the cells in row, select the same number of cells in row and paste
 - B. Copy the cells in column then choose Edit >> Paste Special. then click Transpose and OK
 - C. Copy the cells then go to Format >> Cells then on Alignment tab click Transpose check box and click OK
 - D. Select the cells then place the cell pointer on new cell and choose Edit >> Paste Special, mark Transpose check box and click OK.
141. The brick work is not measured in cu m in case of
- A. One or more than one brick wall
 - B. Brick work in arches
 - C. Reinforced brick work
 - D. Half brick wall
142. The most reliable estimate is
- A. Detailed estimate
 - B. Preliminary estimate
 - C. Plinth area estimate
 - D. Cube rate estimate
143. The damp proof course (D.P.C.) is measured in
- A. cub. m
 - B. sq. m
 - C. metres
 - D. None of these
144. In excel, =SUM (B1 : B8) is an example of a—
- A. function
 - B. formula
 - C. cell address
 - D. value
 - E. None of these
145. www means—
- A. world wide wonder
 - B. world wide wizard
 - C. world wide web
 - D. wide world web
 - E. None of these
146. When a file contains instructions that can be carried out by the computer, it is often called a(n)file.
- A. data
 - B. information
 - C. executable
 - D. application
 - E. None of these

147. CPU is an abbreviation for—
- A. central programming unit
 - B. central processing unit
 - C. computer processing unit
 - D. computer protocol unit
 - E. central protocol unit
148. You can use the.....bar to type a URL and display a Web page, or type a keyword to display a list of related Web pages.
- A. menu
 - B. Title
 - C. Search
 - D. Web
 - E. Address
149. The.....file format is a method of encoding pictures on a computer.
- A. IITML
 - B. JPEG
 - C. FTP
 - D. URL
 - E. (E) DOC
150. The only things moving around inside a computer are
- A. 1s and 0s
 - B. electrons
 - C. bytes
 - D. proton
 - E. All of the above

**Suitability Test for the post of Junior Engineer in Mechanical
Department on compassionate grounds in scale Rs.9300-34800
with Grade Pay of Rs.4200/-.**

Total Marks: 150

Duration: 2 hrs

Date: 02-02-2013

Answer all the questions.

No Negative Marks.

Electronic Items, Cell Phone, Calculator etc are not allowed.

1. When water condenses into ice
(a) Heat is absorbed (b) heat is released
(c) heat remains unchanged (d) none of these.
2. Which of the following inert gas is not found in atmosphere?
(a) Xenon (b) Argon (c) Helium (d) Radon
3. What temperature at Celsius scale is equal to 300°K?
(a) 30°C (b) 27°C (c) 300°C (d) 127°C
4. The headquarters of Central Food Technology Research Institute is located in:
(a) Chennai (b) Anand (c) Ahmedabad (d) Mysore
5. Light year is used to measure
(a) Intensity of light (b) astronomical distance
(c) mass (d) force
6. In which state is Silent Valley located?
(a) Kerala (b) Tamil Nadu (c) Assam (d) Karnataka
7. Solid Carbon dioxide is called
(a) Soft ice (b) white ice (c) dry ice (d) solid ice
8. Product "Fair & Lovely" is related to
(a) ITC (b) P & G (c) HLL (d) Godrej
9. In case the President of India decides to resign, he will address his letter of resignation to
(a) Prime Minister (b) Chief Justice
(c) Speaker of Lok Sabha (d) Vice President
10. The metal extracted from Bauxite is
(a) Silver (b) Copper (c) Manganese (d) Aluminium

11. Capital of Pallavas was
 (a) Arcot (b) Kanchi (c) Takkolam (d) Mamallapuram
12. Onam is an important festival of
 (a) Tamil Nadu (b) Kerala (c) Mizoram (d) Karnataka
13. What determines the sex of a child?
 (a) Chromosomes of the father (b) chromosomes of the mother
 (c) RH factor of the parents (d) Blood group of the father
14. 350% of ? = 700
 (a) 2 (b) 100 (c) 350 (d) 200
15. $(0.25)^2 + (0.15)^2 = ?$
 (a) 0.05 (b) 0.8 (c) 0.08 (d) 0.625
16. Inlet A and B together can fill a tank in 18 hours. Inlet A can fill the tank on its own in 24 hours. In how many hours can inlet B alone fill the tank?
 (a) 48 hrs (b) 72 hrs (c) 60 hrs (d) 84 hrs.
17. In the following number series, only one number is wrong. Find out that wrong number: 1, 2, 2, 4, 8, 64, 256:
 (a) 4 (b) 8 (c) 64 (d) 256
18. London time is five and half hours behind Delhi time. What time is it in London, if it is 02.35 hrs in Delhi?
 (a) 21.05 (b) 08.05 (c) 21.35 (d) 07.05
19. 10^{-2} means:
 (a) Milli (b) Centi (c) Micro (d) Deci
20. The chemical formula of sulphuric acid is:
 (a) H_2SO_4 (b) HSO_4 (c) HCL (d) HNO_3
21. Who was the first Indian to be crowned "Miss World"?
 (a) Aishwarya Rai (b) Priyanka Chopra
 (c) Madhuri Dixit (d) Reita Faria
22. If CANDLE is EYPBNC, then FLAMES is ?
 (a) DJYKCQ (b) HNCOGU (c) HJCKGQ (d) KCHJUA
23. Ram showed an old man and said "his son is my son's uncle". How is the old man related to Ram?
 (a) Father (b) Grandfather (c) Brother (d) Uncle
24. The first Indian Nobel Prize winner was ?
 (a) C.V. Raman (b) Rabindranath Tagore
 (c) Hargovind Khurana (d) Mother Theresa.

25. Where will you find Ventricle in human body?
(a) Kidney (b) Lungs (c) Brain (d) Heart
26. Evaluation of $8^3 \times 8^2 \times 8^{-5} =$
(a) 8 (b) 0 (c) 1 (d) 18864
27. Find the odd one out:
(a) Excel (b) Mouse (c) Desktop (d) Key board.
28. With which sport is Viswanthan Anand associated ?
(a) Chess (b) Football (c) Cricket (d) Shooting
29. The present Governor of Tamil Nadu state is ?
(a) Surjit Singh Barnala (b) Rosaiah
(c) Pranab Mukherjee (d) Jayalalitha
30. Capital of Jammu & Kashmir in winter season is ?
(a) Shimla (b) Srinagar (c) Udhampur (d) Jammu
31. The first Prime Minister of free India
(a) Vallabhai Patel (b) S.C. Bose
(c) Jawaharlal Nehru (d) B.R. Ambedkar
32. The year in which Quit India Movement launched
(a) 1930 (b) 1942
(c) 1939 (d) 1947
33. The only diamond mine in India situated at
(a) KCF (b) Panna
(c) Halli (d) Chitradurg
34. Sugar Bowl of the world is
(a) Cuba (b) Greenland
(c) Andaman (d) India
35. Who wrote Ramayana in Tamil?
(a) Valmiki (b) Kambar
(c) Kuvempu (d) Bharatiyar
36. Identify the author of Discovery of India
(a) Mulk raj Anand (b) Jawaharlal Nehru
(c) Kuldip Nayyar (d) Rajendra Prasad
37. National Animal of India is
(a) Cow (b) Tiger
(c) Lion (d) Horse

38. Which is the longest Railway platform in India?
 (a) Delhi (b) Bangalore
 (c) Sonapur (d) Kharagpur
39. What is the age limit to exercise voting?
 (a) 18 (b) 16
 (c) 21 (d) 20
40. Who implemented prohibition for the first time in India?
 (a) Advani (b) Rajaji
 (c) Indira Gandhi (d) Nehru
41. Which gas is responsible for greenhouse effect
 (a) Ozone (b) Carbon dioxide
 (c) Oxygen (d) Carbon Monoxide
42. Air conditioning system regulates
 (a) Temperature (b) Air velocity
 (c) Humidity (d) All of these
43. Congress is Parliament of
 (a) India (b) Russia
 (c) USA (d) Spain
44. Yen is the currency of
 (a) Japan (b) Italy
 (c) Iraq (d) Israel
45. Capital of Indonesia is
 (a) Bangkok (b) Berne
 (c) Jakarta (d) Kualalampur
46. Which city is called Garden City?
 (a) Udaipur (b) Jaipur
 (c) Nagpur (d) Bangalore
47. Headquarters of South Central Railway is
 (a) Hubli (b) Bangalore
 (c) Mysore (d) Secunderabad
48. Children's Day is celebrated on
 (a) November 14 (b) September 5
 (c) January 26 (d) December 5
49. If Saturday falls four days after today which is 5th January, on what day did the 1st December of the previous year fall?
 (a) Sunday (b) Monday
 (c) Tuesday (d) Wednesday

50. A's income is 25% more than B's income. The percentage of B's income in terms of A's income is
 (a) 80 (b) 70
 (c) 60 (d) None of the above
51. Square root of 2 is
 (a) 1.732 (b) 1.414
 (c) 1.5 (d) 1.876
52. NORTH : SOUTH
 (a) Black : White (b) Yellow: Orange
 (c) Red: Maroon (d) Blue : Indigo
53. The number of integers between 1 and 100 that cannot be divided by any of the integers 2, 3 and 5 are
 (a) 20 (b) 25
 (c) 30 (d) 36
54. If there are four times as many girls as boys in a certain class, which of the following numbers cannot represent the number of students in the class
 (a) 20 (b) 23
 (c) 25 (d) 30
55. If each side of a cube is doubled, its volume
 (a) is doubled (b) becomes 4 times
 (c) becomes 8 times (d) becomes 18 times
56. The HCF of 24 and 32 is
 (a) 4 (b) 6
 (c) 8 (d) 12
57. $(a - b)^2 =$
 (a) $a^2 - b^2$ (b) $a^2 - b^2 + 2ab$
 (c) $a^2 + b^2 - 2ab$ (d) $a^2 + b^2 + 2ab$
58. $\sqrt{a} \times \sqrt{b} =$
 (a) $\sqrt{a+b}$ (b) \sqrt{ab}
 (c) $\sqrt{a/b}$ (d) ab
59. Volume of a sphere is
 (a) $\frac{4}{3} \pi r^2$ (b) $\frac{4}{3} \pi r^3$
 (c) $\frac{2}{3} \pi r^2$ (d) $\frac{2}{3} \pi r^3$
60. A train runs at 45 km per hour. How far does it go in 6 seconds?
 (a) 45 m (b) 60 m
 (c) 75 m (d) None of these.

61. A man travels 8 km east and 3 km towards south, then 4 km towards east. How far is he from the starting point?
 (a) 3 km (b) 4 km
 (c) 5 km (d) None of these.
62. The largest unit of storage in a computer is
 (a) Terabyte (b) Megabyte
 (c) Kilobyte (d) Gigabyte
63. Removing an error in a computer program is called
 (a) Chip (b) Bit
 (c) Debug (d) Virus
64. Which kind of hardware is used the most in the input phase of a computer?
 (a) Monitor (b) Key Board
 (c) Printer (d) Hard Disk
65. The operation of adding two numbers is done in the
 (a) ALU (b) Program (c) Output Unit (d) Control Unit
66. Multimedia devices enable the use of computers for
 (a) Medical Use (b) Defence Use
 (c) Entertainment (d) Automation.
67. Machine language and assembly language are example of
 (a) low level language and high level language respectively.
 (b) high level language and low level language respectively.
 (c) low level languages
 (d) high level languages
68. Unix, DOS, Windows are examples of
 (a) Operating Systems (b) application programs
 (c) word processor (d) commercial computer brands
69. TCP/IP is necessary if one is to connect to the
 (a) server (b) LAN (c) phone lines (d) inetnet
70. An organisation's introductory web pages is called its
 (a) Website (b) Home page (c) Vortal (d) Portal
71. Fluid mechanics is the branch of mechanics which deals with
 (a) Static aspect of fluid (b) kinematic aspect of fluid
 (c) dynamic aspect of fluid (d) All of the above.
72. A substance which offers no resistance to shear deformation is
 (a) solid (b) fluid (c) gas (d) all of these.

73. Density of mercury is
 (a) 13600 kg/m^3 (b) 1000 kg/m^3 (c) 13.6m^3 (d) 136 kg
74. The volume of liquid occupied by its unit mass is called
 (a) specific density (b) specific volume
 (c) specific gravity (d) weight
75. Fluids which have no viscosity and surface tension are called
 (a) ideal fluids (b) Newtonian fluids
 (c) plastic fluids (d) real fluids
76. A phenomenon of rise or fall of liquid surface relative to the adjacent general level of liquid is known as
 (a) surface tension (b) adhesion
 (c) cohesion (d) capillarity.
77. The ratio between actual discharge issued from an orifice and its theoretical discharge is known as
 (a) coefficient of velocity (b) coefficient of resistance
 (c) coefficient of discharge (d) None of these.
78. Francis Turbine is an example of
 (a) impulse turbine (b) reaction turbine
 (c) axial flow turbine (d) High head turbine.
79. Bernoulli's theorem deals with law of conservation of
 (a) Energy (b) Volume (c) Velocity (d) Momentum
80. An air vessel is fitted on
 (a) reciprocating pump (b) centrifugal pump
 (c) turbine pump (d) volute pump
81. If 5m^3 of certain oil weights 3500 kg, specific gravity of the oil is
 (a) 0.7 (b) 7 (c) 700 (d) 0.35
82. The deformation produced in a body due to external load is
 (a) stress (b) strain
 (c) elastic limit (d) factor of safety.
83. Within elastic limit, the ratio of stress to strain is known as
 (a) modulus of rigidity (b) bulk modulus
 (c) shear modulus (d) young's modulus
84. The ratio of limiting friction to the normal reaction is
 (a) Angle of friction (b) Coefficient of friction
 (c) Solid friction (d) None.

85. $I_{zz} = I_{xx} + I_{yy}$ is
 (a) parallel axis theorem (b) perpendicular axis theorem
 (c) both (a) & (b) (d) none of these.
86. A body falls from rest. Its velocity 'V' when it has fallen through a height of 'h' meters is
 (a) $V = \sqrt{2gh}$ (b) $V = \frac{1}{2} gh$
 (c) $V = 2gh$ (d) $V = 1/\sqrt{2gh}$
87. A beam with one end fixed and the other end free is known
 (a) over hanging beam (b) continuous beam
 (c) cantilever beam (d) simply supported beam
88. Velocity ration $VR=n$ (i.e. no. of pulleys) in
 (a) first system of pulleys (b) second system of pulleys
 (c) third system of pulleys (d) none of these
89. "To every action, there is always an equal and opposite reaction"
 (a) Newton's first law (a) Newton's second law
 (c) Newton's third law (d) None of the above
90. The ratio of the load lifted to the effort applied is called
 (a) mechanical advantage (b) velocity ratio
 (c) load factor (d) output of machine.
91. Velocity is a
 (a) Scalar quantity (b) Vector quantity
 (c) All of these. (D) None of these.
92. A car is moving with a velocity of 15 m/sec.
 The car is brought to rest by applying brakes in 5 sec. The retardation is
 (a) $5m/s^2$ (b) $15m/s^2$ (c) $3m/s^2$ (d) $75m/s^2$
93. Value of angle projection (α) for maximum horizontal range is
 (a) 45° (b) 90° (c) 0° (d) 30°
94. The weight of a body on earth is 980N when acceleration due to gravity on earth is $9.8/s^2$. Weight of the body on moon where $g=1.6m/s^2$ is
 (a) 980N (b) 1600N (c) 98N (d) 160N
95. The number of cycles per second is known as
 (a) frequency (b) amplitude (c) oscillation
 (d) simple harmonic motion.
96. The time period for a second's pendulum will be
 (a) 2 sec. (b) 1 sec. (c) 9.81 sec. (d) 0 sec.

97. The equivalent stiffness of two springs which are connected in parallel is equal to
 (a) Stiffness of thicker spring (b) stiffness of thinner spring
 (b) Sum of stiffness of each spring (d) difference between stiffness of two springs
98. The energy of virtue of position of a body with respect to any given datum is called
 (a) potential energy (b) position energy
 (c) datum energy (d) All of these.
99. The maximum stress induced in a body is the load applied suddenly is times of the stress, if the same load applied gradually
 (a) 4 (b) $\frac{1}{2}$ (c) 2 (d) 1
100. The bending moment is maximum at a section where
 (a) shear force is zero after changing its sign.
 (b) shear force is maximum.
 (c) shear force is constant.
 (d) shear force is a parabolic curve.
101. The height of the spring when the coils are touching each other is known as
 (a) solid length (b) deflection (c) stiffness (d) gauge.
102. EULER's column theory is applicable for
 (a) short columns (b) long columns
 (c) both columns (d) none
103. The edges of the plates to be jointed together overlap each other in case of
 (a) Lap joint (b) Butt joint (c) Diamond joint (d) 'V' joint.
104. A riveted joint may fail due to
 (a) shearing of rivet (b) crushing of rivet
 (c) crushing of plate (d) all of the above.
105. Advantages of a gear drive over a belt drive is
 (a) speed ratio is more (b) no slip
 (c) less space is required (d) all of these
106. The radial distance of a tooth from pitch circle to the top of the tooth is
 (a) Addendum (b) Dedendum
 (c) Pitch (d) Tooth depth.
107. The smallest diameter of an external thread is known as
 (a) minor diameter (b) core diameter
 (c) root diameter (d) all of the above.

108. Angle of thread in Acme thread is
 (a) 60° (b) 29° (c) 90° (d) 120°
109. Stresses induced in the shafts are
 (a) shear stresses (b) bending stresses.
 (c) both (a) & (b) (d) none.
110. The keys fitted in pair at right angles are known as
 (a) saddle keys (b) round keys (c) tangent keys (d) woodruff keys.
111. The coefficient of friction between belt and pulley depends on
 (a) belt material (b) pulley material
 (c) speed of the belt (d) All of these.
112. The teeth on the gear surface may be
 (a) straight (b) inclined (c) curved (d) All of the above.
113. An example of ferrous metal is
 (a) aluminium (b) copper
 (c) zinc (d) steel
114. Which is an organic polymer?
 (a) PVC (b) nylon
 (c) synthetic rubber (d) all of these.
115. The ability of a material to withstand scratching (abrasion) by another hard body is
 (a) brittleness (b) ductility
 (c) hardness (d) toughness
116. Brass is an alloy of
 (a) copper and tin (b) copper and zinc
 (c) bronze and lead (d) copper and lead
117. The heat treatment process which provide softness to metal is
 (a) tempering (b) annealing
 (c) nitriding (d) flame hardening
118. In a lathe, top portion of the carriage is called
 (a) Apron (b) cross slide
 (c) Saddle (d) Compound rest
119. Milling several surfaces of the work piece at a time is
 (a) gang milling (b) straddle milling
 (c) string milling (d) face milling
120. Least count of a micrometer is
 (a) 0.01 mm (b) 0.02 mm
 (c) 0.1 mm (d) 0.2 mm

121. Due to this property, the material dissipates heat while current flows through it.
 (a) conductivity (b) power
 (c) resistance (d) hardness
122. In a unit cell of body centre cubic space lattice (B.C.C.), there are
 (a) 14 atoms (b) 9 atoms
 (c) 17 atoms (d) none
123. Defect in crystals are
 (a) point defects (b) line defects
 (c) surface defects (d) all of these.
124. A ring gauge is used to
 (a) check the dia of shafts (b) test the accuracy of holes
 (c) check the clearance between two mating surfaces (d) All of these.
125. Work study generally consists of
 (a) method study (b) work measurement
 (c) both (a) and (b) (d) none
126. In a flow process chart, a square represents
 (a) Transportation (b) Process
 (c) Inspection (d) Delay
127. Which of the following is a type of Gantt Chart?
 (a) Layout chart (b) Man and Machine chart
 (c) Load chart (d) All of these.
128. This inspection is also known as constructive inspection
 (a) preventive inspection (b) floor inspection
 (c) operative inspection (d) centralized inspection
129. Thermodynamic system in which energy cross the boundary but not mass is called
 (a) open system (b) closed system
 (c) isolated system (d) none of these.
130. "If two systems are both in thermal equilibrium with a third system, they are in thermal equilibrium with each other" is
 (a) Zeroth law of thermodynamics (b) first law of thermodynamics
 (c) second law of thermodynamics (d) third law of thermodynamics
131. In a polytropic process($PV^n = \text{constant}$), if $n=0$, then the process is called
 (a) Isothermal process (b) Isentropic process
 (c) Isobaric process (d) Reversible adiabatic process

132. "The volume of a given mass of a perfect gas varies inversely as the absolute pressure when the temperature is constant" is
 (a) Charle's law (b) Avogadro's law
 (c) Boyle's law (d) Universal law
133. Universal gas constant in SI units is
 (a) 848 (b) 831 (c) 287 (d) 8314
134. "Whenever a system undergoes a cyclic change, the algebraic sum of work transfer is proportional to the algebraic sum of heat transfer" is
 (a) First law thermodynamics (b) second law thermodynamics
 (c) Third law thermodynamics (d) none of these.
135. Sum of internal energy and pressure volume product is known as
 (a) Enthalpy (b) Entropy (c) Isotropy (d) None of these.
136. A body which observes all the radiation energy incident on it is defined as
 (a) Black body (b) Grey body (c) white body
 (d) Opaque body.
137. When there is cooling water scarcity, the type of condenser used is
 (a) jet condenser (b) surface condenser
 (c) ejector condenser (d) evaporative condenser
138. In steam power plant having reciprocating steam engine as the prime mover, the ideal cycle used is known as:
 (a) Rankine cycle (b) Modified Rankine cycle
 (c) Carnot cycle (d) Joule's cycle
139. Piston is at B.D.C. in diesel engine in
 (a) Power stroke (b) Exhaust stroke
 (c) Suction stroke (d) compression stroke
140. Power is less for the same size and the same number of revolution in
 (a) Two stroke engine (b) Four stroke engine
 (c) Both (a) & (b) (d) Neither (a) nor (b)
141. Maximum temperature in the engine cylinder is achieved in
 (a) Suction stroke (b) Expansion stroke
 (c) Exhaust stroke (d) Compression stroke
142. Diesel is a mixture of
 (a) benzene and haptene (b) propane and haptene
 (c) hydrocarbons (d) benzene and propane
143. The material of piston in a jeep engine is
 (a) aluminium alloy (b) copper (c) zinc (d) iron

144. Dryness fraction of steam is:
- (a) $\frac{\text{Weight of dry steam}}{\text{Weight of stuff}}$ (b) $\frac{\text{Weight of moisture}}{\text{Weight of dry steam}}$
(c) Any of the above (d) None of the above.
145. Compression ratio for spark ignition engines varies in the range
(a) 4 to 6 (b) 6 to 12 (c) 12 to 20 (d) 20 to 25
146. At 'break even' point
(a) constant expenses = profits
(b) Total sales = variable expenses
(c) Variable expenses – profits = Total sales
(d) None of the above.
147. Which of the following is indirect cost?
(a) cost of raw material (b) cost of machining
(c) power consumption in fabrication (d) Training for job
148. PERT analysis is based on
(a) Optimistic time (b) Pessimistic time
(c) Most likely time (d) All of the above.
149. The chart used to review the overall sequence of an operation by focusing
Either the movement of operators or materials is called
(a) SIMO chart (b) NEMA chart (c) Flow process chart
(d) Gantt chart
150. A process layout is generally suggested for
(a) jobbing work (b) batch production (c) planned production
(d) discontinuous production



Suitability Test for the post of Junior Engineer in Mechanical Department on compassionate grounds in scale Rs.9300-34800 with Grade Pay of Rs.4200/-

Total Marks: 150

Duration: 2 hrs

Date: 03-05-2013

Answer all the questions.

No Negative Marks.

Electronic Items, Cell Phone, Calculator etc are not allowed.

1. The Unit of time in S.I. units is
(a) second (b) minute
(c) hour (d) day
2. On weight basis, air contains following parts of oxygen
(a) 21 (b) 23
(c) 25 (d) 73
3. The term N.T.P. stands for
(a) nominal temperature and pressure (b) natural temperature and pressure
(c) normal temperature and pressure (d) normal thermodynamic practice
4. The working cycle in cases of four stroke engine is completed in following number of revolutions of crank shaft
(a) $\frac{1}{2}$ (b) 1
(c) 2 (d) 4
5. The air-fuel ratio of the petrol engine is controlled by
(a) fuel pump (b) governor
(c) injector (d) carburetor
6. Diesel fuel, compared to petrol is
(a) less difficult to ignite (b) just about the same to ignite
(c) more difficult to ignite (d) highly ignitable.
7. Engine pistons are usually made of aluminum alloy because it
(a) is lighter (b) wears less
(c) absorbs shocks (d) is stronger

- 8 The thermal efficiency of a two stroke engine as compared to four stroke engine is
 (a) more (b) less
 (c) same (d) more upto some load and then less
- 9 Fins are provided over engine cylinder in scooters for
 (a) higher strength of cylinder (b) better cooling
 (c) good appearance (d) higher efficiency
- 10 Carburettation is done to
 (a) feed petrol into cylinder (b) govern the engine
 (c) breakup and mix petrol with air (d) heat up the charge to cylinder
- 11 The following type of battery is commonly used in automobile applications
 (a) dry battery (b) nickel-cadmium
 (c) jacket cooling water (d) lead acid
- 12 The economizer is used in boilers to
 (a) increase thermal efficiency of boiler (b) economize on fuel
 (c) extract heat from the exhaust flue gases (d) increase flue gas temperature
- 13 Density of water is maximum at
 (a) 0°C (b) 0°K
 (c) 4°C (d) 100°C
- 14 Mercury does not wet glass. This is due to property of liquid known as
 (a) adhesion (b) cohesion
 (c) surface tension (d) viscosity
- 15 Property of a fluid by which its own molecules are attracted is called
 (a) adhesion (b) cohesion
 (c) viscosity (d) compressibility
- 16 Bernoulli equation deals with the law of conservation of
 (a) mass (b) momentum
 (c) energy (d) work
- 17 One horsepower is equal to
 (a) 102 watts (b) 75 watts
 (c) 550 watts (d) 735 watts
- 18 The unit of force in S.I. units is
 (a) kilogram (b) newton
 (c) watt (d) dyne

- 19 The unit of power in S.I. units
 (a) newton metre (b) watt
 (c) joule (d) kilogram metre/sec.
- 20 Forces are called coplanar when all of them acting on body lie in
 (a) one point (b) one plane
 (c) different planes (d) perpendicular planes
- 21 Which of the following is not a vector quantity
 (a) weight (b) velocity
 (c) acceleration (d) force
- 22 Joule is the unit of
 (a) force (b) work
 (c) power (d) energy
- 23 A swinging pendulum eventually stops because its energy is
 (a) destroyed (b) converted to kinetic energy
 (c) converted to potential energy (d) converted to heat energy
- 24 Strain is defined as the ratio of
 (a) change in volume to original volume (b) change in length to original length
 (c) any of the above (d) none of the above
- 25 Hooke's law hold good upto
 (a) yield point (b) limit of proportionality
 (c) breaking point (d) elastic limit
- 26 The property of a material which allows it to be drawn into smaller section is called
 (a) plasticity (b) ductility
 (c) elasticity (d) malleability
- 27 Rivets are made of the following type of material
 (a) tough (b) hard
 (c) resilient (d) ductile
- 28 Units of strain are
 (a) dimensionless (b) cm/cm
 (c) kg/cm²/cm (d) kg/cm
- 29 In the case of cantilever, irrespective of the type of loading, the maximum bending moment and maximum shear force occur at
 (a) free end (b) under the load
 (c) fixed end (d) middle

- 30 Damping capacity of a material is its ability to
 (a) absorb shock (b) absorb vibrations
 (c) withstand compression (d) absorb impact loads
- 31 The point of contraflexure is a point where
 (a) shear force is zero (b) shear force changes sign
 (c) bending moment changes sign (d) bending moment is maximum
- 32 In arc welding, eyes need to be protected against
 (a) intense glare (b) sparks
 (c) infra-red rays (d) infra-red and ultraviolet rays
- 33 The main criterion for selection of electrode diameter in arc welding is
 (a) material to be welded (b) type of welding process
 (c) thickness of material (d) voltage used
- 34 The material used for coating the electrode is called
 (a) protective layer (b) binder
 (c) flux (d) slag
- 35 Solder is essentially a
 (a) tin-silver base (b) tin lead base
 (c) tin-bismuth base (d) silver lead base
- 36 Long wires are made by following process
 (a) extrusion (b) rolling
 (c) piercing (d) drawing
- 37 Galvanising is
 (a) a zinc diffusion process (b) an oxidising process used for aluminium and magnesium articles.
 (c) a process used for making thin phosphate coatings on steel to act as a base or primer for enamels and paints (d) is the process of coating of zinc by hot dipping
- 38 18-4-1 high speed steel contains following elements in ratio of 18-4-1
 (a) tungsten (W), chromium (Cr) & vanadium (V) (b) Cr, V, W
 (c) W, Mn, Cr (d) W, V, Cr
- 39 Size of shaper is specified by
 (a) length of stroke (b) size of table
 (c) maximum size of tool (d) ratio of forward to return stroke
- 40 Harder materials wear
 (a) faster (b) slower
 (c) both the above (d) none of the above

- 41 Tapping is used for
 (a) threading (b) drilling
 (c) cutting (d) none of the above.
- 42 Surface roughness on a drawing is represented by
 (a) triangles (b) circles
 (c) squares (d) rectangles
- 43 Annealing is done by cooling in
 (a) air (b) furnace
 (c) water (d) brine
- 44 Typical locating devices for cylindrical job used in jigs and fixture
 (a) drill jigs (b) V-blocks
 (c) mandrels (d) angle plates
- 45 Plug gauges are used to
 (a) measure the diameter of the workpieces (b) measure the diameter of the holes in the workpieces
 (c) check the diameter of the holes in the workpieces (d) check the length of the holes in the workpieces.
- 46 What does symbol 'O' imply in work study
 (a) operation (b) inspection
 (c) transport (d) delay
- 47 String diagram is used when
 (a) team of workers working at place (b) material handling is to be done
 (c) idle time is to be reduced (d) all of the above.
- 48 Product layout is employed for
 (a) batch production (b) continuous productions
 (c) effective utilization of machine (d) all of the above
- 49 In Inventory control, the economic order quantity is the
 (a) optimum lot size (b) highest level of inventory
 (c) lot corresponding to break-even point (d) none of the above.
- 50 PERT stands for
 (a) project evaluation and review technique (b) project examination and review technique
 (c) project evaluation and reporting technique (d) process execution and reporting technology
- 51 Queing theory is associated with
 (a) sales (b) inspection time
 (c) waiting time (d) production time.

- 52 Gross national product means
 (a) total earning of all citizens (b) total taxes paid
 (c) expenditure by government (d) total value of goods produced in a country
- 53 The slack on various events at critical path will be
 (a) same as at the end point (b) decreasing proportional to that at the end point
 (c) increasing proportional to that at the end point (d) maximum compared to other Events
- 54 Father of time study was
 (a) F.W. Taylor (b) H.L. Gantt
 (c) F.B. Gilberth (d) R.M. Barnes
- 55 Accuracy is
 (a) the repeatability of a measuring process (b) error of judgement in recording an observation
 (c) the ability of the instrument to reproduce same reading under identical situations (d) agreement of the result of a measurement with the true value of the measured quantity
- 56 Universal surface gauge is used
 (a) for flatness testing (b) for layout work and inspection
 (c) for measuring profile of complex surface (d) for measuring surface roughness
- 57 Straight edges are to measure
 (a) straight length of parts (b) flatness
 (c) parallelism (d) perpendicularity
- 58 Bevel protractor is used for
 (a) angular measurements (b) linear measurements
 (c) height measurements (d) flatness measurements
- 59 Addendum of a gear is equal to
 (a) pitch p (b) 0.3 p
 (c) 0.3183 p (d) 0.3683 p
- 60 Corrosion resistance of steel is increased by addition of
 (a) chromium and nickel (b) sulphur, phosphorus, lead
 (c) vanadium, aluminium (d) zinc
- 61 Steel contains
 (a) 80% more iron (b) 50% more iron
 (c) alloying elements like chromium, tungsten, nickel and copper (d) elements like phosphorus, sulphur and silicon in varying quantities.

- 62 The unique property of cast iron is its high
 (a) malleability (b) ductility
 (c) surface finish (d) damping characteristics
- 63 Pig iron is the name given to
 (a) raw material for blast furnace (b) product of blast furnace made by reduction of iron ore
 (c) iron containing huge quantities of carbon (d) iron scrap
- 64 In grey cast iron, carbon is present in the form of
 (a) cementite (b) free carbon
 (c) flakes (d) spheroids
- 65 Which of the following constituents of steels is softest and least strong
 (a) austenite (b) pearlite
 (c) ferrite (d) cementite
- 66 Machining properties of steel are improved by adding
 (a) sulphur, lead, phosphorous (b) silicon, aluminium, titanium
 (c) vanadium, aluminium (d) chromium, nickel
- 67 An engineer's hammer is made of
 (a) cast iron (b) forged steel
 (c) mild steel (d) high carbon steel
- 68 Which is the false statement about annealing. Annealing is done to
 (a) relieve stresses (b) harden steel slightly
 (c) improve machining characteristic (d) soften material
- 69 Melting point of iron is
 (a) 1539°C (b) 1601°C
 (c) 1489°C (d) 1712°C
- 70 Corrosion resistance of steel is increased by adding
 (a) chromium and nickel (b) nickel and molybdenum
 (c) aluminium and zinc (d) none of the above
- 71 Which of the following is used for bearing liner
 (a) gun metal (b) bronze
 (c) bell metal (d) babbit metal
- 72 Brass contains
 (a) 70% copper and 30% zinc (b) 90% copper and 10% zinc
 (c) 70% copper and 30% tin (d) none of the above.
- 73 The transistor is made of
 (a) silver (b) gold
 (c) copper (d) germanium

- 74 Blast furnace used the following as fuel
 (a) coal (b) coke
 (c) diesel (D) liquid oxygen
- 75 To form basic slag, the following is added
 (a) lime (b) coke
 (c) scrap (d) manganese
- 76 The hardest known material is
 (a) ceramic (b) high speed steel
 (c) diamond (d) cemented carbide
- 77 Which of the following has maximum malleability
 (a) lead (b) brass
 (c) copper (d) aluminium
- 78 Moh's scale is used in connection with
 (a) composition of metal (b) hardness of materials
 (c) wear criterion of metals (d) tensile strength of metals
- 79 The main purpose of heat treatment of steels is to change the
 (a) chemical composition (b) mechanical properties
 (c) corrosion properties (d) surface finish
- 80 Steels are primarily designated according to
 (a) iron content (b) carbon content
 (c) alloying elements (d) hardness
- 81 The largest unit of storage in a computer is
 (a) megabyte (b) byte
 (c) kilobyte (d) gigabyte
- 82 Which kind of hardware is used the most in the input phase of a computer?
 (a) Monitor (b) Keyboard
 (c) Printer (d) Hard Disk
- 83 Unix, DOS, Windows are examples of
 (a) operating systems (b) application programmes
 (c) wordprocessor (d) computer brands
- 84 Removing an error in a computer program is called
 (a) Chip (b) debug
 (c) bit (d) cleaning
- 85 An error in a computer data is called:
 (a) chip (b) bit
 (c) bug (d) hanging

- 86 One thousand kilobytes represent
(a) one gigabyte (b) one megabyte
(c) one gigabyte (d) one terabyte
- 87 Which kind of storage is easy to carry
(a) System cabinet (b) pen drive
(c) hard disk (d) mother board
- 88 Multimedia devices enable the use of computers for
(a) Medical Use (b) Defence use
(c) Entertainment (d) Automation
- 89 TCP/IP is a kind of
(a) software (b) hardware
(c) protocol (d) none of the above
- 90 Who is the owner of Microsoft?
(a) Ford (b) Bill Gates
(c) IBM (d) None of the above
- 91 Who was the first Prime Minister of India
(a) Sardar Vallabhai Patel (b) Jawaharlal Nehru
(c) Mahatma Gandhiji (d) C. Rajagopalachari
- 92 Which is the national animal of India
(a) Lion (b) Cow
(c) Tiger (d) Elephant
- 93 In which sport Vishwanthan Anand associated with?
(a) Cricket (b) Football
(c) Tennis (d) Chess
- 94 Who wrote Ramayana in Tamil?
(a) Kambar (b) Valmiki
(c) Tulisidass (d) Subramani Bharati
- 95 Which is the capital of Malaysia?
(a) Bangkok (b) Colombo
(c) Kualalumpur (d) Dhaka
- 96 Who was the first President of India
(a) C.Rajagopalachari (b) Rajendra Prasad
(c) Sardar Vallabhai Patel (d) Govind Vallabhai Pant
- 97 Which is the capital of Bihar
(a) Lucknow (b) Patna
(c) Kolkata (d) Mumbai

- 98 Who is UPA Chairman?
(a) PawanKumar Bansal (b) C.P. Joshi
(c) Mukul Roy (d) Sonia Gandhi
- 99 Which is the national flower of India?
(a) Jasmine (b) Rose
(c) Lotus (d) Hibiscus
- 100 Capital of Pandiyas is
(a) Madurai (b) Kancheepuram
(c) Thanjavur (d) Mamallapuram
- 101 Onam is an important festival of
(a) Tamil Nadu (b) Andhra Pradesh
(c) Kerala (d) Karnataka
- 102 Quit India Movement was launched in the year
(a) 1942 (b) 1930
(c) 1947 (d) 1932
- 103 Which is the longest Railway platform in India
(a) Pune (b) Kharagpur
(c) New Delhi (d) Lucknow
- 104 What is the minimum age for voting?
(a) 21 years (b) 24 years
(c) 18 years (d) 15 years
- 105 Yen is the currency of
(a) Japan (b) China
(c) Pakistan (d) Phillippines
- 106 Who wrote "My Experiments with Truth"
(a) Jawaharlal Nehru (b) Sardar Vallabhai Patel
(c) Babasaheb Ambedkar (d) Mahatma Gandhiji
- 107 Banaras Hindu University is situated in
(a) Bihar (b) Maharashtra
(c) Uttar Pradesh (d) Madhya Pradesh
- 108 In which State Vikram Sarabbhai Space Centre located?
(a) Andhra Pradesh (b) Kerala
(c) Tamil Nadu (d) Maharashtra
- 109 Do which Country cricketer Kumara Sangakkara belongs to
(a) Sri Lanka (b) India
(c) Pakistan (d) Australia

- 110 Which city is called Pink City?
(a) Bangalore (b) Jaipur
(c) Hyderabad (d) New Delhi
- 111 Headquarters of South Central Railway is located at
(a) Hubli (b) Mumbai
(c) Chennai (d) Secunderabad
- 112 Teachers Day is celebrated on
(a) November 14 (b) September 5
(c) August 15 (d) June 10
- 113 Which is the new State to be formed?
(a) Jharkand (b) Chattisgarh
(c) Telengana (d) Orissa
- 114 Chemical Formula for water is
(a) H_2O (b) OH_2
(c) H_2OS (d) S_2O
- 115 Which country is called "Land of Rising Sun"
(a) Norway (b) China
(c) Sweden (d) Japan.
- 116 HCF of 12 and 24 is
(a) 6 (b) 12
(c) 24 (d) 18
- 117 Square Root of 3 is
(a) 1.732 (b) 1.414
(c) 1.856 (d) 1.783
- 118 LCM of 5 and 6 is
(a) 25 (b) 60
(c) 15 (d) 30
- 119 Evaluation of $8^2 \times 8^2 \times 8^{-4}$
(a) 0 (b) 1
(c) 8 (d) 32
- 120 Find the odd out
(a) Excel (b) Mouse
(c) Desktop (d) Keyboard
- 121 350% of 100 is
(a) 350 (b) 250
(c) 200 (d) 300

- 122 In the following number series, only one number is wrong. Find out that wrong number: 1, 2, 4, 8, 16, 32, 256
 (a) 8 (b) 16
 (c) 1 (d) 256
- 123 $0.25 + 0.35 =$
 (a) 0.05 (b) 0.5
 (c) 0.6 (d) .06
- 124 $\sqrt{a} \times \sqrt{b} =$
 (a) $\sqrt{a+b}$ (b) \sqrt{ab}
 (c) $\sqrt{a/b}$ (d) ab
- 125 A train runs at 45 km per hour. How far does it go in 60 minutes?
 (a) 45 kms (b) 60 kms
 (c) 75 kms (d) 35 kms
- 126 A man travels 8 km east and 3 km towards south, then 4 km towards east. How far is he from the starting point?
 (a) 3 kms (b) 4 kms
 (c) 5 kms (d) none of the above
- 127 NORTH : SOUTH
 (a) Black : White (b) Yellow: Orange
 (c) Red: Maroon (d) Blue : Indigo
- 128 A pencil cost 5 paise. They are sold at 20% profit. Find out the selling price of one dozen pencils
 (a) 72 paise (b) 60 paise
 (c) 50 paise (d) none of the above
- 129 Solid Carbon dioxide is called
 (a) soft ice (b) white ice
 (c) dry ice (d) solid ice
- 130 Light year is used to measure
 (a) intensity of light (b) mass
 (c) astronomical distance (d) force
- 131 $1/100 =$
 (a) Milli (b) Centi
 (c) Micro (d) Deci
- 132 Chemical Formula of sulphuric acid is
 (a) H_2SO_4 (b) HSO
 (c) HCL (d) HNO

- 133 If there are four times as many girls as boys in a certain class, which of the following numbers cannot represent the number of students in the class
 (a) 20 (b) 23
 (c) 25 (d) 30
- 134 If each side of a cube is doubled, its volume
 (a) is doubled (b) becomes 4 times
 (c) becomes 8 times (d) becomes 18 times
- 135 A's income is 25% more than B's income. If the income of B is 500, income of A will be
 (a) 625 (b) 525
 (c) 425 (d) none of the above
- 136 Evaluate $8^2 \times 4^2$
 (a) 64 (b) 1024
 (c) 586 (d) 84
- 137 If one side of a square measures 10 metres, what will be its area
 (a) 100 (b) 200
 (c) 1000 (d) 3000
- 138 $a+b+c =$
 (a) $b+c+a$ (b) $c+b+a$
 (c) $c+a+b$ (d) All of the above
- 139 Velocity is a
 (a) Scalar Quantity (b) Vector Quantity
 (c) All of these (d) none of these
- 140 Gravitational acceleration g is equal to
 (a) 9.81 m/s^2 (b) 9 m/s^2
 (c) 10 m/s^2 (d) none of the above
- 141 $8+5-10+6-2-11 =$
 (a) -4 (b) -5
 (c) +4 (d) +5
- 142 $(a - b)^2 =$
 (a) $a^2 - b^2$ (b) $a^2 - b^2 + 2ab$
 (c) $a^2 + b^2 - 2ab$ (d) $a^2 + b^2 + 2ab$
- 143 Least count of a micrometer is
 (a) 0.01 mm (b) 0.02 mm
 (c) 0.1 mm (d) 0.2 mm

- 144 Least count of a vernier calipers
(a) 0.1 mm (b) 0.2 mm
(c) 0.01 mm (d) 0.02 mm
- 145 An example of ferrous metal is
(a) Aluminium (b) Copper
(c) Zinc (d) Steel
- 146 $1/2 \times 2/4 \times 8/4 =$
(a) $1/4$ (b) $1/2$
(c) 2 (d) $1/8$
- 147 $1/2 + 2/4 =$
(a) 1 (b) $1/4$
(c) $3/4$ (d) $2/4$
- 148 General Manager of S.Rly is
(a) Rajesh Chopra (b) Rakesh Misra
(c) G. Narayanan (d) none of the above
- 149 CME means
(a) Chief Mechanical Engineer (b) Chief Motive Power Engineer
(c) Chief Medical Engineer (d) None of the above.
- 150 Most of the cars use
(a) 2-stroke engine (b) 4-stroke engine
(c) 5-stroke engine (d) none of the above.

SUITABILITY TEST FOR THE POST OF JUNIOR ENGINEER ON COMPASSIONATE GROUNDS

Total marks : 150

Duration : 2 hours

Date: 13.10.18

Answer all the questions

No negative marks for wrong answers

Calculator and any other electronic devices are not allowed:

I – General Awareness and General Knowledge:

1	How many Satellites in a single mission using PSLV C-37 launched in February 15th 2017?	
	(a) 110	(b) 108
	(c) 106	(d) 104
2	Which is the second largest moon in our solar system?	
	(a) Titan	(b) Callista
	(c) Europa	(d) Ganymede
3	Mostly which gases found of the planet Jupiter?	
	(a) Oxygen and Hydrogen	(b) Oxygen and Nitrogen
	(c) Nitrogen and Hydrogen	(d) Hydrogen and Helium
4	WINGS OF FIRE book is written by	
	(a) Rabindranath Tagore	(b) Arunthathi Roy
	(c) A.P.J.Abdul Kalam	(d) J.K.Rowling
5	What is the full form of NASA?	
	(a) North American Secret Agency	(b) The National Aeronautics and Space Administration
	(c) North Atlantic Security Administration	(d) National Academy of Sports Association
6	What is the name of the president of India?	
	(a) Pranab Mukherjee	(b) Ram Nath Kovind
	(c) Narendra Modi	(d) Vengaiiah Naidu
7	Who was the founder of Brahma Samaj?	
	(a) Swamy Vivekananda	(b) Ram Krishna Gokale
	(c) Bal Gangadhar Tilak	(d) Raja Ram Mohan Roy
8	Which gas is most popular as laughing gas?	
	(a) Carbon di oxide	(b) Ammonia
	(c) Nitrous oxide	(d) Carbon mono oxide
9	The Folded Earth book was written by?	
	(a) Anuradha Roy	(b) Arundhati Roy
	(c) Salman Rushdi	(d) V.S.Naipal
10	What is the staple food of one third of the world's total population?	
	(a) Rice	(b) Wheat
	(c) Potato	(d) Meat

11	Who was the first man into space?	
	(a) Valentina Teraskova	(b) Yuri Gagarin
	(c) Alan Shepard	(d) Rakesh sharma
12	What is the IMF description?	
	(a) International Monetary Fund	(b) International Missionary Fund
	(c) International Maritime Fund	(d) Interenational Motion Films
13	For how many years is Sheep able to breed?	
	(a) 25 years	(b) 20 years
	(c) 15 years	(d) 10 years
14	In eye donation which part of donor's eye is utilized?	
	(a) Iris	(b) Retina
	(c) Cornea	(d) Sclera
15	The Indian Constitution provides for the appointment of adhoc judges in the?	
	(a) Supreme Court	(b) High Court
	(c) Sessions Court	(d) District Court
16	Which is the world's largest dry desert?	
	(a) Arabian	(b) Thaar
	(c) Sahara	(d) Great victoria
17	Where is India's first indigenously developed 500-Megawatt (MW) prototype fast breeder reactor located?	
	(a) Kalpakkam	(b) Koodankulam
	(c) Tharapur	(d) Kaiga
18	Who laid the foundation of Nuclear Science in India?	
	(a) Homi J. Bhabha	(b) R.S.Krishnan
	(c) Vikram Sarabhai	(d) A.P.J.Abdulkalam
19	The filament of an electric bulb is made of which metal?	
	(a) Vanadium	(b) Tungsten
	(c) Nickel	(d) Copper
20	In which state was the Nalanda University located in India?	
	(a) Bihar	(b) Uttar Pradesh
	(c) Utharakand	(d) Utharanchal
21	In which century did the famous Chinese pilgrim Fahien visit India?	
	(a) 3 rd Century AD	(b) 4 th Century AD
	(c) 5 th century AD	(d) 6 rd Century AD
22	Why energy is continuously generated in the sun?	
	(a) Due to Nuclear fission	(b) Due to Nuclear fusion.
	(c) Both a and b	(d) None

23	What is the name of cheque when a Bank returns unpaid?	
	(a) Dishonor of the cheque.	(b) Honor of Cheque
	(c) Cheque default	(d) Unpaid Cheque
24	Which country become the first in the world to double its tiger population?	
	(a) India	(b) Bhutan
	(c) Nepal	(d) Pakistan
25	Who topped in the Barclays Hurun India Rich List 2018?	
	(a) Mukesh Ambani	(b) Asim Premji
	(c) Palonji Mistry	(d) Lakshmi Mittal

II - Arithmetic:

26	If $x:y = 2:3$ and $2:x = 1:2$, then the value of y is:	
	(a) 6	(b) 8
	(c) 2	(d) 4
27	Square root of 2 is	
	(a) 1.2131	(b) 1.732
	(c) 1.4142	(d) 1
28	A student was asked to divide a number by 6. But instead of dividing the number he multiplied the number and got 90. What was the correct answer?	
	(a) 4.5	(b) 2.5
	3.5	(d) 5.5
29	The weight of a 13 m long iron rod is 23.4 kg. The weight of 6 m long of such rod will be:	
	(a) 10.8 kg	(b) 80.1 kg
	(c) 1.08 kg	(d) 8.01kg
30	$3 + 7 \times 3 - 40 \div 2 = ?$	
	(a) 10	(b) 4
	(c) -8	(d) -5
31	The monthly salary of A, B & C is in the proportion of 2:3:5. If C's monthly salary is Rs. 1200 more than that of A, B's annual salary is	
	(a) Rs.14400	(b) Rs.1200
	(c) Rs. 12400	(d) Rs.1400
32	The distance covered in 15 minutes by a train moving at a speed of 60 kmph is	
	(a) 7.5 km	(b) 4 km
	(c) 75 km	(d) 15 km
33	A man travels 17 km north and 4 km towards east and then 20 km towards south. How far he is from the starting point?	
	(a) 4 km	(b) 2 km
	(c) 5 km	(d) 3 km
34	The ratio of two numbers is 3:4 and their sum is 420. The greater of the two numbers is:	
	(a) 40	(b) 240
	(c) 140	(d) 420

35	If $2A=3B=4C$ then A:B:C is:	
	(a) 3:4:6	(b) 6:4:3
	(c) 4:3:6	(d) 6:3:4
36	If 10% of x is the same as 20% y, then x:y is equal to:	
	(a) 2:1	1:2
	(c) 3:2	(d) 2:3
37	Out of the ratios 7 : 15, 15 : 23, 17 : 25 and 21 : 29, the smallest one is :	
	(a) 17:25	(b) 15:23
	(c) 21:29	(d) 7 : 15
38	What must be added to each term of the ration 7 : 13 so then the ratio becomes 2 : 3 ?	
	(a) 3	(b) 4
	(c) 5	(d) 2
39	A and B can together do a piece of work in 15 days. B alone can do it in 20 days. In how many days can A alone do it?	
	(a) 60 days	(b) 35 days
	(c) 45 days	(d) 25 days
40	$0.0^2 + 5.0^2 \times 0.0^2 \div 0.6^2 =$	
	(a) 0.694	(b) 0.833
	(c) 0.000	(d) 1.000
41	A man purchased a watch for Rs. 400 and sold it at a gain of 20% of the selling price. The selling price of the watch is:	
	(a) Rs. 500	(b) Rs. 480
	(c) Rs. 380	(d) Rs. 420
42	4, 7, 12, K, 28, 39...What is the value of K in the series.	
	(a) 19	(b) 20
	(c) 23	(d) 17
43	Five years ago Vinay's age was one-third of the age of Vikas and now Vinay's age is 17 years. What is the present age of Vikas?	
	(a) 36 years	(b) 9 years
	(c) 41 years	(d) 51 years
44	I have a few sweets to be distributed. If I keep 2, 3 or 4 in a pack, I am left with one sweet. If I keep 5 in a pack, I am left with none. What is the minimum number of sweets I can have to pack and distribute?	
	(a) 37	(b) 25
	(c) 54	(d) 65

45	At the end of a business conference, ten people present shake hands with each other once. How many handshakes will be there all together?	
	(a) 20	(b) 55
	(c) 90	(d) 45
46	A bus starts from city X. The number of women in the bus is half the number of men. In the city Y, 10 men left the bus and five women boarded in to it. Now, number of men and women becomes equal. In the beginning, how many passengers entered the bus?	
	(a) 45	(b) 15
	(c) 30	(d) 36
47	A worker may claim Rs.15 for each km which he travels by taxi and Rs.5 for each km which he drives his own car. If in one week he claimed Rs.500 for travelling 80 km, how many km did he travel by taxi?	
	(a) 10	(b) 40
	(c) 20	(d) 30
48	Between two book-ends in your study are displayed your five favourite puzzle books. If you decide to arrange the five books in every possible combination and moved just one book every minute, how long would it take?	
	(a) 1 hr	(b) 2 hrs
	(c) 3 hrs	(d) 4hrs
49	LCM of 3 and 7 is	
	(a) 10	(b) 21
	(c) 28	(d) 24
50	At simple interest, a sum doubles after 20 years. The rate of interest per annum is	
	(a) 5%	(b) 10%
	(c) 12%	(d) 15%

III - General Intelligence and Reasoning:

51	Letter : Telegram ; Train : ?	
	(a) Aeroplane	(b) Horse
	(c) Passengers	(d) Messenger
52	The odd person among the following is	
	(a) Pankaj advani	(b) Saina nehwal
	(c) Sania mirza	(d) Lal Krishna advani
53	Error : Mistake	
	(a) Music : Art	(b) Connection : Retaliation
	(c) Literature : Poetry	(d) Doubt : Suspicion
54	Condensation : Sublimation : Vaporisation	
	(a) These terms are used in Physics	(b) These terms are used to denote different states of liquid
	(c) These terms are used to denote change of form from one state to another state	(d) These terms show the chemical reaction

Directions for Q-55 to 57: These questions are based on the following information for an examination:

(A) Candidates appeared	10500
(B) Passed in all the five subjects	5685
(C) Passed in three subjects only	1498
(D) Passed in two subjects only	1250
(E) Passed in one subject only	835
(F) Failed in English only	78
(G) Failed in Mathematics only	275
(H) Failed in Physics only	149
(I) Failed in Chemistry only	147
(J) Failed in Biology only	221

55	How many candidates passed in at least four subjects	
	(a) 870	(b) 1705
	(c) 5685	(d) 6555

56	How many candidates failed in all the subjects?	
	(a) 362	(b) 3317
	(c) 2867	(d) 4815

57	How many candidates failed because of having failed in four or less subjects	
	(a) 2368	(b) 4815
	(c) 3618	(d) 4453

58	Choose the correct answer	
	(a) $-40 \text{ deg F} = -40 \text{ deg C}$	(b) $+40 \text{ deg F} = -40 \text{ deg C}$
	(c) $-40 \text{ deg F} = +40 \text{ deg C}$	(d) $+40 \text{ deg F} = +40 \text{ deg C}$

59	4, 16, 36, 64, 100, _____?	
	(a) 120	(b) 144
	(c) 180	(d) 136

60	$\forall\beta\forall, \beta\alpha\beta, \alpha E\alpha, E\infty$?	
	(a) α	(b) β
	(c) \forall	(d) E

IV- Technical Ability:

61	Which of the following laws is applicable for the behavior of a perfect gas	
	(a) Boyle's law	(b) Charles'law
	(c) Gay-Lussac law	(d) all of the above

62	The unit of mass in S.I. units is	
	(a) kilogram	(b) gram
	(c) tone	(d) quintal

63	No liquid can exist as liquid at	
	(a) - 273 °K	(b) vacuum
	(c) zero pressure	(d) centre of earth
64	The ratio of two specific heats of air is equal to	
	(a) 0.17	(b) 0.24
	(c) 0.1	(d) 1.41
65	Work done is zero for the following process	
	(a) constant volume	(b) free expansion
	(c) throttling	(d) all Of the above
66	Mixture of ice and water form a	
	(a) closed system	(b) open system
	(c) heterogenous system	(d) isolated system
67	The unit of power in S.I. units is	
	(a) Newton	(b) Pascal
	(c) erg	(d) watt
68	For which of the following substances, the internal energy and enthalpy are the functions of temperature only	
	(a) any gas	(b) saturated steam
	(c) water	(d) perfect gas
69	The term N.T.P. stands for	
	(a) nominal temperature and pressure	(b) natural temperature and pressure
	(c) normal temperature and pressure	(d) normal thermodynamic practice
70	Which of the following processes is irreversible process	
	(a) isothermal	(b) adiabatic
	(c) throttling	(d) all of the above
71	A fluid is said to be ideal, if it is	
	(a) incompressible	(b) inviscous
	(c) viscous and incompressible	(d) inviscous and incompressible
72	Density of water is maximum at	
	(a) 0°C	(b) 0°K
	(c) 4°C	(d) 100°C
73	Which of the following is dimensionless	
	(a) specific gravity	(b) specific volume
	(c) specific viscosity	(d) specific weight
74	When the flow parameters at any given instant remain same at every point, then flow is said to be	
	(a) quasi static	(b) steady state
	(c) laminar	(d) uniform

75	The bulk modulus of elasticity with increase in pressure	
	(a) increases	(b) decreases
	(c) remains constant	(d) increases first up to certain limit and then decreases
76	Which of the following meters is not associated with viscosity	
	(a) Red wood	(b) Say bolt
	(c) Engler	(d) Orsat
77	The property of fluid by virtue of which it offers resistance to shear is called	
	(a) surface tension	(b) adhesion
	(c) viscosity	(d) cohesion
78	Which of the following is the unit of kinematic viscosity	
	(a) pascal	(b) poise
	(c) stoke	(d) faraday
79	The resultant upward pressure of a fluid on a floating body is equal to the weight of the fluid displaced by the body. This definition is according to	
	(a) Buoyancy	(b) Equilibrium of a floating body
	(c) Archimedes' principle	(d) Bernoulli's theorem
80	The process of diffusion of one liquid into the other through a semi-permeable membrane is called	
	(a) viscosity	(b) osmosis
	(c) surface tension	(d) cohesion
81	Rotameter is a device used to measure	
	(a) absolute pressure	(b) velocity of fluid
	(c) flow	(d) rotation
82	The upper surface of a weir over which water flows is known as	
	(a) crest	(b) nappe
	(c) sill	(d) contracta
83	Pitot tube is used for measurement of	
	(a) pressure	(b) velocity
	(c) flow	(d) discharge
84	Cavitation is caused by	
	(a) high velocity	(b) high pressure
	(c) weak material	(d) low pressure
85	Bernoulli equation deals with the law of conservation of	
	(a) mass	(b) momentum
	(c) energy	(d) work

86	Ductility of a material can be defined as	
	(a) ability to undergo large permanent deformations in compression	(b) ability to recover its original form
	(c) ability to undergo large permanent deformations in tension	(d) all of the above
87	Mild steel belongs to the following category	
	(a) low carbon steel	(b) medium carbon steel
	(c) high carbon steel	(d) alloy steel
88	Pure iron is the structure of	
	(a) ferrite	(b) pearlite
	(c) austenite	(d) ferrite and cementite
89	Poise is the unit of	
	(a) surface tension	(b) capillarity
	(c) viscosity	(d) shear stress in fluids
90	The percentage of carbon in pig iron varies from	
	(a) 0.1 to 1.2%	(b) 1.5 to 2.5%
	(c) 2.5 to 4%	(d) 4 to 4.5%
91	Cast iron is characterised by minimum of following %age of carbon	
	(a) 0.2%	(b) 0.8%
	(c) 1.3%	(d) 2%
92	Corrosion resistance of steel is increased by addition of	
	(a) chromium and nickel	(b) sulphur, phosphorus, lead
	(c) vanadium, aluminium	(d) tungsten, molybdenum, vanadium, chromium
93	Basic constituents of Monel metal are	
	(a) nickel, copper	(b) nickel, molybdenum
	(c) zinc, tin, lead	(d) nickel, lead and tin
94	Solder is an alloy consisting of	
	(a) tin, antimony, copper	(b) tin and copper
	(c) tin and lead	(d) lead and zinc
95	An example of amorphous material is	
	(a) zinc	(b) lead
	(c) silver	(d) glass
96	Cupola produces following material	
	(a) cast iron	(b) pig iron
	(c) wrought iron	(d) malleable iron

97	Brass contains	
	(a) 70% copper and 30% zinc	(b) 90% copper and 10% tin
	(c) 85-92% copper and rest tin with little lead and nickel	(d) 70-75% copper and rest tin
98	If a refractory contains high content of silicon, it means refractory is	
	(a) acidic	(b) basic
	(c) neutral	(d) brittle
99	Neutral solution is one which has pH value	
	(a) greater than 7	(b) less than 7
	(c) equal to 7	(d) pH value has nothing to do with neutral solution
100	The transistor is made of	
	(a) silver	(b) gold
	(c) copper	(d) germanium
101	The working cycle in case of four stroke engine is completed in following number of revolutions of crankshaft	
	(a) 1/2	(b) 1
	(c) 2	(d) 4
102	Supercharging is the process of	
	(a) supplying the intake of an engine with air at a density greater than the density of the surrounding atmosphere	(b) providing forced cooling air
	(c) injecting excess fuel for raising more load	(d) supplying compressed air to remove combustion products fully
103	Compression ratio of I.C. engines is	
	(a) the ratio of volumes of air in cylinder before compression stroke and after compression stroke	(b) volume displaced by piston per stroke and clearance volume in cylinder
	(c) ratio of pressure after compression and before compression	(d) swept volume/cylinder volume
104	Which of the following is not an internal combustion engine	
	(a) 2-stroke petrol engine	(b) 4-stroke petrol engine
	(c) diesel engine	(d) steam turbine
105	Which of the following medium is compressed in a Diesel engine cylinder	
	(a) air alone	(b) air and fuel
	(c) air and lub oil	(d) fuel alone
106	When crude oil is heated, then which of the following hydrocarbon is given off first.	
	(a) kerosene	(b) gasoline
	(c) paraffin	(d) natural gas

107	A 75 cc engine has following parameter as 75 cc	
	(a) fuel tank capacity	(b) lub oil capacity
	(c) swept volume	(d) cylinder volume
108	The specific fuel consumption of a petrol engine compared to diesel engine of same H.P. is	
	(a) same	(b) more
	(c) less	(d) less or more depending on operating conditions
109	The size of inlet valve of an engine in comparison to exhaust valve is	
	(a) more	(b) less
	(c) same	(d) more/less depending on capacity of engine
110	The fuel air ratio in a petrol engine fitted with suction carburetor, operating with dirty air filter as compared to clean filter will be	
	(a) higher	(b) lower
	(c) remain unaffected	(d) unpredictable
111	The specific volume of steam with increase in pressure decreases	
	(a) linearly	(b) slowly first and then rapidly
	(c) rapidly first and then slowly	(d) inversely
112	One kg of steam sample contains 0.8 kg dry steam; it's dryness fraction is	
	(a) 0.2	(b) 0.8
	(c) 1.0	(d) 0.6
113	If a steam sample is nearly in dry condition, then its dryness fraction can be most accurately determined by	
	(a) throttling calorimeter	(b) separating calorimeter
	(c) combined separating and throttling calorimeter	(d) bucket calorimeter
114	On Mollier chart, flow through turbine is represented by	
	(a) horizontal straight line	(b) vertical straight line
	(c) straight inclined line	(d) curved line
115	Latent heat of dry steam at atmospheric pressure is equal to	
	(a) 539 kcal/kg	(b) 539 BTU/lb
	(c) 427 kcal/kg	(d) 100 kcal/kg
116	While steam expands in turbines, theoretically the entropy	
	(a) remains constant	(b) increases
	(c) decreases	(d) behaves unpredictably
117	The increase in pressure	
	(a) lowers the boiling point of a liquid	(b) raises the boiling point of a liquid
	(c) does not affect the boiling point of a liquid	(d) reduces its volume

118	Hygrometry deals with the	
	(a) Hygroscopic substances	(b) water vapour in air
	(c) temperature of air	(d) pressure of air
119	Efficiency of rankine cycle can be increased by	
	(a) decreasing initial steam pressure and temperature	(b) increasing exhaust pressure
	(c) decreasing exhaust pressure	(d) increasing the expansion ratio
120	Lancashire 'boiler is a	
	(a) stationary fire tube boiler	(b) stationary water tube boiler
	(c) water tube boiler with natural/forced circulation	(d) mobile fire tube boiler
121	One kilowatt-hour energy is equivalent to	
	(a) 1000 J	(b) 360 kJ
	(c) 3600 kJ	(d) 3600 kW/sec
122	Steam engine operates on	
	(a) carnot cycle	(b) joule cycle
	(c) Stirling cycle	(d) brayton cycle
123	Pulley in a belt drive acts as	
	(a) cylindrical pair	(b) turning pair
	(c) rolling pair	(d) sliding pair
124	A universal joint is an example of	
	(a) higher pair	(b) lower pair
	(c) rolling pair	(d) sliding pair
125	Elements of pairs held together mechanically is known as	
	(a) closed pair	(b) open pair
	(c) mechanical pair	(d) rolling pair
126	Relationship between the number of links (L) and number of pairs (P) is	
	(a) $P = 2L - 4$	(b) $P = 2L + 4$
	(c) $P = 2L + 2$	(d) $P = 2L - 2$
127	The type of coupling used to join two shafts whose axes are neither in same straight line nor parallel, but intersect is:	
	(a) flexible coupling	(b) universal coupling
	(c) chain coupling	(d) Oldham's coupling
128	The Hooke's joint consists of	
	(a) two forks	(b) one fork
	(c) three forks	(d) four forks

129	In an ideal machine, the output as compared to input is	
	(a) less	(b) more
	(c) equal	(d) may be less or more depending on efficiency
130	Idler pulley is used	
	(a) for changing the direction of motion of the belt	(b) for applying tension
	(c) for increasing -velocity ratio	(d) all of the above
131	Hooke's law holds good up to	
	(a) yield point	(b) limit of proportionality
	(c) breaking point	(d) elastic limit
132	Young's modulus is defined as the ratio of	
	(a) volumetric stress and volumetric strain	(b) lateral stress and lateral strain
	(c) longitudinal stress and longitudinal strain	(d) shear stress to shear strain
133	The impact strength of a material is an index of its	
	(a) toughness	(b) tensile strength
	(c) capability of being cold worked	(d) hardness
134	Which of the following has no unit	
	(a) kinematic viscosity	(b) surface tension
	(c) bulk modulus	(d) strain
135	The value of Poisson's ratio for cast iron is	
	(a) 0.1 to 0.2	(b) 0.23 to 0.27
	(c) 0.25 to 0.33	(d) 0.4 to 0.6
136	The maximum strain energy that can be stored in a body is known as	
	(a) impact energy	(b) resilience
	(c) proof resilience	(d) modulus of resilience
137	A cylindrical section having no joint is known as	
	(a) jointless section	(b) homogeneous section
	(c) perfect section	(d) seamless section.
138	Coulomb friction is the friction between	
	(a) bodies having relative motion	(b) two dry surfaces
	(c) two lubricated surfaces	(d) solids and liquids
139	Tangent of angle of friction is equal to	
	(a) kinetic friction	(b) limiting friction
	(c) angle of repose	(d) coefficient of friction

140	The M.I. of hollow circular section about a central axis perpendicular to section as compared to its M.I. about horizontal axis is	
	(a) same	(b) double
	(c) half	(d) four times
141	Work study is concerned with	
	(a) improving present method and finding standard time	(b) motivation of workers
	(c) improving production capability	(d) improving production planning and control
142	String diagram is used when	
	(a) team of workers is working at a place	(b) material handling is to be done
	(c) idle time is to be reduced	(d) all of the above
143	Job evaluation is the method-of determining the	
	(a) relative worth of jobs	(b) skills required by a worker
	(c) contribution of a worker	(d) contribution of a job
144	Gantt chart provides information about the	
	(a) material handling	(b) proper utilisation of manpower
	(c) production schedule	(d) efficient working of machine
145	ABC analysis deals with	
	(a) analysis of process chart	(b) flow of material
	(c) ordering schedule of job	(d) controlling inventory costs money
146	PERT is the	
	(a) time oriented technique	(b) event oriented technique
	(c) activity oriented technique	(d) target oriented technique
147	Centrifugal pump is started with its delivery valve	
	(a) kept fully closed	(b) kept fully open
	(c) irrespective of any position	(d) kept 50% open
148	Francis turbine is best suited for	
	(a) medium head application from 24 to 180 m	(b) low head installation up to 30 m
	(c) high head installation above 180m	(d) all types of heads
149	Reaction turbines are used for	
	(a) low head	(b) high head
	(c) high head and low discharge	(d) low head and high discharge.
150	What was the world's first high level programming language in 1957?	
	(a) IBM FORTRAN	(b) PASCAL
	(c) JAVA	(d) C++

SUITABILITY TEST FOR THE POST OF JE/MECHANICAL ON COMPASSIONATE GROUNDS

Total marks : 150

Duration : 2 hours

Date: 10.10.19

Answer all the questions

No negative marks for wrong answers

Calculator and any other electronic devices are not allowed:

I – General Awareness and General Knowledge:

1	Who bagged two Oscar Awards for the film Slum Dog Millionaire ?	
	(a) Gulzar	(b) Satyajit Ray
	(c) A.R.Rehman	(d) Bhanu Athaiya
2	The first Indian women who travelled in American space shuttle, Columbia was	
	(a) Indira nooyi	(b) Saniya Mirza
	(c) Nirmala Sitaraman	(d) Kalpana Chawla
3	Which gas is most popular as laughing gas?	
	(a) Carbon di oxide	(b) Ammonia
	(c) Nitrous oxide	(d) Carbon mono oxide
4	Who is the Author of Indian National Anthem?	
	(a) Rabindranath Tagore	(b) Thiruvalluvar
	(c) Bankim Chandra Chatterjee	(d) Subramanya Bharati
5	What is the full form of ISRO?	
	(a) International Society of Relief Order	(b) Indian Space Research Organization
	(c) International Sports Regulatory organization	(d) Indian Social Reforms Organization
6	What is the name of the Defense Minister of India?	
	(a) Amit Shah	(b) Nirmala Sitaraman
	(c) Rajnath Singh	(d) Jaishankar
7	The first battle of Panipat took place in which year?	
	(a) 1652	(b) 1526
	(c) 1656	(d) 1562
8	Which state of India is famously known as "God's Own Country"?	
	(a) Himachal Pradesh	(b) Assam
	(c) Kerala	(d) Goa
9	The God of Small Things book was written by?	
	(a) Anuradha Roy	(b) Arundhati Roy
	(c) Salman Rushdi	(d) V.S.Naipal
10	What is the staple food of one third of the world's total population?	
	(a) Rice	(b) Wheat
	(c) Potato	(d) Meat
11	The Head Quarters of United Nations Organization is situated at?	
	(a) Paris	(b) London
	(c) New Delhi	(d) New York
12	P.V.Singhu is famous for?	
	(a) Cricket	(b) Table Tennis
	(c) Squash	(d) Badminton

13	The Denque fever is caused by which of the following?	
	(a) Mosquitos	(b) Flies
	(c) Dogs	(d) Rats
14	In eye donation which part of donor's eye is utilized?	
	(a) Iris	(b) Retina
	(c) Cornea	(d) Sclera
15	Part III (Articles 12 to 35) of the Constitution of India, deals with	
	(a) Special care to weaker sections of the people	(b) Fundamental Rights
	(c) Right to Education	(d) Financial Emergency
16	Who topped in the Barclays Hurun India Rich List 2018?	
	(a) Mukesh Ambani	(b) Asim Premji
	(c) Palonji Mistry	(d) Lakshmi Mittal
17	Where is India's first indigenously developed 500-Megawatt (MW) prototype fast breeder reactor located?	
	(a) Kalpakkam	(b) Koodankulam
	(c) Tharapur	(d) Kaiga
18	The height of Mount Everest is?	
	(a) 8488 m	(b) 4848 m
	(c) 8848 m	(d) 4488 m
19	The filament of an electric bulb is made of which metal?	
	(a) Vanadium	(b) Tungsten
	(c) Nickel	(d) Copper
20	What is the name of the ancient route between India and China?	
	(a) Gold road	(b) Diamond road
	(c) Silk road	(d) Platinum road
21	In which century did the famous Chinese pilgrim Fahien visit India?	
	(a) 3 rd Century AD	(b) 4 th Century AD
	(c) 5 th century AD	(d) 6 rd Century AD
22	Ustad Zakir Hussain the Indian composer is famous for...	
	(a) Guitar	(b) Tabla
	(c) Violin	(d) Piano
23	Cobra Venom contains?	
	(a) Haemo toxins.	(b) Neuro toxins.
	(c) Both (a) and (b)	(d) None of the above
24	Which country is having the second highest population in the world?	
	(a) India	(b) China
	(c) United States of America	(d) Russia
25	Name of the border line between India and Pakistan	
	(a) Radcliff	(b) MacMohan
	(c) Palk Strait	(d) None of the above

II – Arithmetic:

26	The difference between the place value and the face value of 6 in the numeral 856973 is	
	(a) 973	(b) 6973
	(c) 5994	(d) None of the above
27	Square root of 2 is	
	(a) 1.2131	(b) 1.732
	(c) 1.4142	(d) 1
28	$8597 - ? = 7429 - 4358$	
	(a) 5426	(b) 5706
	(c) 5526	(d) 547
29	If the number $5k2$ is divisible by 6, then $k=?$	
	(a) 2	(b) 3
	(c) 6	(d) 7
30	$3 + 7 \times 3 - 40 \div 2 = ?$	
	(a) 10	(b) 4
	(c) -8	(d) -5
31	How many prime numbers are less than 50 ?	
	(a) 14	(b) 15
	(c) 16	(d) 17
32	If X and Y are odd numbers, then which of the following is even?	
	(a) X+Y	(b) XY
	(c) X+Y+1	(d) XY+2
33	A man travels 17 km north and 4 km towards east and then 20 km towards south. How far he is from the starting point?	
	(a) 4 km	(b) 2 km
	(c) 5 km	(d) 3 km
34	The sum of the two numbers is 12 and their product is 35. What is the sum of the reciprocals of these numbers ?	
	(a) $12/35$	(b) $1/35$
	(c) $35/8$	(d) $7/32$
35	If $2A=3B=4C$ then A:B:C is:	
	(a) 3:4:6	(b) 6:4:3
	(c) 4:3:6	(d) 6:3:4
36	The ratio 5 : 4 expressed as a percent equals :	
	(a) 12.5%	125%
	(c) 40%	(d) 80%
37	$860\% \text{ of } 50 + 50\% \text{ of } 860 = ?$	
	(a) 430	(b) 516
	(c) 860	(d) 960
38	What must be added to each term of the ratio 7 : 13 so then the ratio becomes 2 : 3 ?	
	(a) 3	(b) 4
	(c) 5	(d) 2

39	A and B can together do a piece of work in 15 days. B alone can do it in 20 days. In how many days can A alone do it?	
	(a) 60 days	(b) 35 days
	(c) 45 days	(d) 25 days
40	$0.0^2 + 5.0^2 \times 0.0^2 \div 0.6^2 =$	
	(a) 0.694	(b) 0.833
	(c) 0.000	(d) 1.000
41	An agent gets a commission of 2.5% on the sales of cloth. If on a certain day, he gets Rs.12.50 as commission, the cloth sold through him on that day is worth	
	(a) Rs. 500	(b) Rs. 250
	(c) Rs. 1250	(d) Rs. 750
42	4, 7, 12, 19, P, 39... What is the value of P in the series?	
	(a) 19	(b) 20
	(c) 28	(d) 17
43	Five years ago Vicky's age was one-third of the age of Sofy and now Vicky's age is 17 years. What is the present age of Sofy?	
	(a) 36 years	(b) 9 years
	(c) 41 years	(d) 51 years
44	The total of the ages of Amar, Akbar and Anthony is 80 years. What was the total of their ages three years ago?	
	(a) 71 years	(b) 72 years
	(c) 74 years	(d) 77 years
45	A number of friends decided to go on a picnic and planned to spend Rs. 96 on eatables. Four of them, however, did not turn up. As a consequence, the remaining ones had to contribute Rs. 4 each extra. The number of those who attended the picnic was	
	(a) 8	(b) 12
	(c) 16	(d) 16
46	A student got twice as many sums wrong as he got right. If he attempted 48 sums in all, how many did he solve correctly?	
	(a) 12	(b) 16
	(c) 18	(d) 24
47	A worker may claim Rs.15 for each km which he travels by taxi and Rs.5 for each km which he drives his own car. If in one week he claimed Rs.500 for travelling 80 km, how many km did he travel by taxi?	
	(a) 10	(b) 40
	(c) 20	(d) 30
48	In a group of cows and hens, the number of legs are 14 more than twice the number of heads. The number of cows is	
	(a) 5	(b) 7
	(c) 10	(d) 12
49	At simple interest, a sum doubles after 20 years. The rate of interest per annum is	
	(a) 5%	(b) 10%
	(c) 12%	(d) 15%

50	Aruna cut a cake into two halves and cuts one half into smaller pieces of equal size. Each of the small pieces is twenty grams in weight. If she has seven pieces of the cake in all with her, how heavy was the original cake?	
	(a) 120 grams	(b) 140 grams
	(c) 240 grams	(d) 280 grams

III – General Intelligence and Reasoning:

51	Arrange the words given below in a meaningful sequence. 1.Key 2.Door 3.Lock 4.Room 5.Switch on	
	(a) 5, 1, 2, 4, 3	(b) 4, 2, 1, 5, 3
	(c) 1, 3, 2, 4, 5	(d) 1, 2, 3, 5, 4

52	The odd person among the following is	
	(a) Manthana	(b) Saina Nehwal
	(c) Sania mirza	(d) Smriti Irani

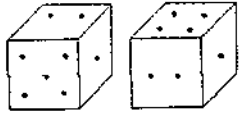
53	Error : Mistake	
	(a) Music : Art	(b) Connection : Retaliation
	(c) Literature : Poetry	(d) Doubt : Suspicion

54	Pointing to a photograph of a boy Suresh said, "He is the son of the only son of my mother." How is Suresh related to that boy?	
	(a) Brother	(b) Uncle
	(c) Cousin	(d) Father

55	Flow : River :: Stagnant : ?	
	(a) Rain	(b) Stream
	(c) Pool	(d) Canal

56	NATION : ANTINO :: HUNGRY : ?	
	(a) HNUGRY	(b) UHNGYR
	(c) YRNGUH	(d) UNHGYR

57	Choose the word which is different from the rest.	
	(a) Chicken	(b) Snake
	(c) Swan	(d) Crocodile

58	Two positions of dice are shown below. How many points will appear on the opposite to the face containing 5 points?	
		
	(a) 3	(b) 1
	(c) 2	(d) 4

59	Which one of the following is always found in 'Bravery'?	
	(a) Experience	(b) Power
	(c) Courage	(d) Knowledge

60	3, 10, 101, ?	
	(a) 10101	(b) 10201
	(c) 10202	(d) 11012

IV- Technical Ability:

61	Which of the following laws is applicable for the behavior of a perfect gas	
	(a) Boyle's law	(b) Charles' law
	(c) Gay-Lussac law	(d) all of the above
62	Which of the following item is not a path function?	
	(a) Heat	(b) Work
	(c) Kinetic energy	(d) Thermal conductivity
63	The absolute zero pressure can be attained at a temperature of	
	(a) 0 deg C	(b) -273 deg C
	(c) 273 deg C	(d) None of these
64	For the same maximum Pressure and Temperature,	
	(a) Otto cycle is more efficient than Diesel cycle	(b) Diesel cycle is more efficient than Otto cycle
	(c) Dual cycle is more efficient than Otto and Diesel cycles	(d) Dual cycle is less efficient than Otto and Diesel cycles
65	Work done is zero for the following process	
	(a) constant volume	(b) free expansion
	(c) throttling	(d) all Of the above
66	Mixture of ice and water form a	
	(a) closed system	(b) open system
	(c) heterogeneous system	(d) isolated system
67	Which of the following is not the unit of work, energy and heat ?	
	(a) Kcal	(b) Kgm
	(c) kWhr	(d) hp
68	One molecule of oxygen consists of _____ atoms of oxygen.	
	(a) 2	(b) 4
	(c) 8	(d) 16
69	The term N.T.P. stands for	
	(a) nominal temperature and pressure	(b) natural temperature and pressure
	(c) normal temperature and pressure	(d) normal thermodynamic practice
70	Total heat of a substance is also known as	
	(a) Internal energy	(b) Entropy
	(c) Thermal capacity	(d) Enthalpy
71	A fluid is said to be ideal, if it is	
	(a) incompressible	(b) inviscous
	(c) viscous and incompressible	(d) inviscous and incompressible
72	Density of water is maximum at	
	(a) 0°C	(b) 0°K
	(c) 4°C	(d) 100°C

73	Which of the following is dimensionless	
	(a) specific gravity	(b) specific volume
	(c) specific viscosity	(d) specific weight
74	The viscosity of water is _____ than that of mercury.	
	(a) Higher	(b) Lower
	(c) Same as	(d) None of these
75	The surface tension of mercury at normal temperature compared to that of water is	
	(a) More	(b) Less
	(c) Same	(d) More or less depending on size of glass tub
76	Which of the following meters is not associated with viscosity	
	(a) Red wood	(b) Say bolt
	(c) Engler	(d) Orsat
77	The property of fluid by virtue of which it offers resistance to shear is called	
	(a) surface tension	(b) adhesion
	(c) viscosity	(d) cohesion
78	Which of the following is the unit of kinematic viscosity	
	(a) pascal	(b) poise
	(c) stoke	(d) faraday
79	According to the principle of buoyancy a body totally or partially immersed in a fluid will be lifted up by a force equal to	
	(a) The weight of the body	(b) More than the weight of the body
	(c) Less than the weight of the body	(d) Weight of the fluid displaced by the body
80	A double overhung Pelton wheel has	
	(a) Two jets	(b) Two runners
	(c) Four jets	(d) Four runners
81	Rotameter is a device used to measure	
	(a) absolute pressure	(b) velocity of fluid
	(c) flow	(d) rotation
82	The upper surface of a weir over which water flows is known is	
	(a) crest	(b) nappe
	(c) sill	(d) contracta
83	Pitot tube is used for measurement of	
	(a) pressure	(b) velocity
	(c) flow	(d) discharge
84	Cavitation is caused by	
	(a) high velocity	(b) high pressure
	(c) weak material	(d) low pressure

85	The atmospheric pressure at sea level is	
	(a) 103 kN/m ²	(b) 10.3 m of water
	(c) 760 mm of mercury	(d) All of these
86	Poise is the unit of	
	(a) surface tension	(b) capillarity
	(c) viscosity	(d) shear stress in fluids
87	The Cipoletti weir is a _____ weir.	
	(a) Rectangular	(b) Triangular
	(c) Trapezoidal	(d) Circular
88	Bronze is an alloy of	
	(a) Copper and zinc	(b) Copper and tin
	(c) Copper, tin and zinc	(d) None of these
89	Pure iron is the structure of	
	(a) ferrite	(b) pearlite
	(c) austenite	(d) ferrite and cementite
90	Ductility of a material can be defined as	
	(a) ability to undergo large permanent deformations in compression	(b) ability to recover its original form ²
	(c) ability to undergo large permanent deformations in tension	(d) all of the above
91	The percentage of carbon in low carbon steel is	
	(a) 0.05%	(b) 0.15%
	(c) 0.3%	(d) 0.5%
92	Corrosion resistance of steel is increased by addition of	
	(a) chromium and nickel	(b) sulphur, phosphorus, lead
	(c) vanadium, aluminium	(d) tungsten, molybdenum, vanadium, chromium
93	Basic constituents of Monel metal are	
	(a) nickel, copper	(b) nickel, molybdenum
	(c) zinc, tin, lead	(d) nickel, lead and tin
94	Solder is an alloy consisting of	
	(a) tin, antimony, copper	(b) tin and copper
	(c) tin and lead	(d) lead and zinc
95	The elastic stress strain behavior of rubber is	
	(a) Linear	(b) Nonlinear
	(c) Plastic	(d) No fixed relationship
96	Cupola produces following material	
	(a) cast iron	(b) pig iron
	(c) wrought iron	(d) malleable iron

97	In process annealing, the hypo eutectoid steel is	
	(a) Heated from 30°C to 50°C above the upper critical temperature and then cooled slowly in the furnace	(b) Heated from 30°C to 50°C above the upper critical temperature and then cooled suddenly in a suitable cooling medium
	(c) Heated from 30°C to 50°C above the upper critical temperature and then cooled in still air	(d) Heated below or closes to the lower critical temperature and then cooled slowly
98	If a refractory contains high content of silicon, it means refractory is	
	(a) acidic	(b) basic
	(c) neutral	(d) brittle
99	Neutral solution is one which has pH value	
	(a) greater than 7	(b) less than 7
	(c) equal to 7	(d) pH value has nothing to do with neutral solution
100	Duralumin contains	
	(a) 3.5 to 4.5% copper, 0.4 to 0.7% magnesium, 0.4 to 0.7% manganese and rest aluminium	(b) 3.5 to 4.5% copper, 1.2 to 1.7% manganese, 1.8 to 2.3% nickel, 0.6% each of silicon, magnesium and iron, and rest aluminium
	(c) 4 to 4.5% magnesium, 3 to 4% copper and rest aluminium	(d) 5 to 6% tin, 2 to 3% copper and rest aluminium
101	The reason for supercharging in any engine is to	
	(a) Increase efficiency	(b) Increase power
	(c) Reduce weight and bulk for a given output	(d) Effect fuel economy
102	Scavenging is usually done to increase	
	(a) Thermal efficiency	(b) Speed
	(c) Power output	(d) Fuel Consumption
103	The thermal efficiency of diesel engines is about	
	(a) 15%	(b) 30%
	(c) 50%	(d) 70%
104	Number of working strokes per min. for a two stroke cycle engine is _____ the speed of the engine in r.p.m.	
	(a) Equal to	(b) One-half
	(c) Twice	(d) Four-times
105	Which of the following medium is compressed in a Petrol engine cylinder	
	(a) air alone	(b) air and fuel
	(c) air and lub oil	(d) fuel alone
106	Which of the following does not relate to a compression ignition engine?	
	(a) Fuel pump	(b) Fuel injector
	(c) Governor	(d) Carburettor

107	Air fuel ratio for idling speed of a petrol engine is approximately	
	(a) 1 : 1	(b) 5 : 1
	(c) 10 : 1	(d) 15 : 1
108	The specific fuel consumption of a petrol engine compared to diesel engine of same H.P. is	
	(a) same	(b) more
	(c) less	(d) less or more depending on operating conditions
109	The size of inlet valve of an engine in comparison to exhaust valve is	
	(a) more	(b) less
	(c) same	(d) more/less depending on capacity of engine
110	The air-fuel ratio of the petrol engine is controlled by	
	(a) Fuel pump	(b) Governor
	(c) Injector	(d) Carburettor
111	The expansion of steam in a nozzle follows	
	(a) Carnot cycle	(b) Rankine cycle
	(c) Joule cycle	(d) Stirling cycle
112	The mechanical draught _____ with the amount of smoke.	
	(a) Increases	(b) Decreases
	(c) Does not effect	(d) None of these
113	Boiler parameters are expressed by	
	(a) Tonnes/hr. of steam	(b) Pressure of steam in kg/cm ²
	(c) Temperature of steam in °C	(d) All of the above
114	On Mollier chart, flow through turbine is represented by	
	(a) horizontal straight line	(b) vertical straight line
	(c) straight inclined line	(d) curved line
115	Latent heat of dry steam at atmospheric pressure is equal to	
	(a) 539 kcal/kg	(b) 539 BTU/lb
	(c) 427 kcal/kg	(d) 100 kcal/kg
116	While steam expands in turbines, theoretically the entropy	
	(a) remains constant	(b) increases
	(c) decreases	(d) behaves unpredictably
117	At which pressure the properties of water and steam become identical	
	(a) 0.1 kg/cm ²	(b) 1 kg/cm ²
	(c) 100 kg/cm ²	(d) 225.6 kg/cm ²
118	Hygrometry deals with the	
	(a) Hygroscopic substances	(b) water vapour in air
	(c) temperature of air	(d) pressure of air

119	Which of the following is not a boiler mounting?	
	(a) Blow off cock	(b) Feed check valve
	(c) Economiser	(d) Fusible plug
120	Lancashire boiler is a	
	(a) stationary fire tube boiler	(b) stationary water tube boiler
	(c) water tube boiler with natural/forced circulation	(d) mobile fire tube boiler
121	One kilowatt-hour energy is equivalent to	
	(a) 1000 J	(b) 360 kJ
	(c) 3600 kJ	(d) 3600 kW/sec
122	Which of the following coals has the highest calorific value?	
	(a) Anthracite coal	(b) Bituminous coal
	(c) Lignite	(d) Peat
123	In considering friction of a V-thread, the virtual coefficient of friction (μ_1) is given by	
	(a) $\mu_1 = \mu \sin \beta$	(b) $\mu_1 = \mu \cos \beta$
	(c) $\mu_1 = \mu / \sin \beta$	(d) $\mu_1 = \mu / \cos \beta$
124	A universal joint is an example of	
	(a) higher pair	(b) lower pair
	(c) rolling pair	(d) sliding pair
125	A kinematic chain is known as a mechanism when	
	(a) None of the links is fixed	(b) One of the links is fixed
	(c) Two of the links are fixed	(d) None of these
126	Relationship between the number of links (L) and number of pairs (P) is	
	(a) $P = 2L - 4$	(b) $P = 2L + 4$
	(c) $P = 2L + 2$	(d) $P = 2L - 2$
127	In a gear having involute teeth, the normal to the involute is a tangent to the	
	(a) Pitch circle	(b) Base circle
	(c) Addendum circle	(d) Dedendum circle
128	The Hooke's joint consists of	
	(a) two forks	(b) one fork
	(c) three forks	(d) four forks
129	Critical damping is a function of	
	(a) Mass and stiffness	(b) Mass and damping coefficient
	(c) Mass and natural frequency	(d) Damping coefficient and natural frequency
130	Idler pulley is used	
	(a) for changing the direction of motion of the belt	(b) for applying tension
	(c) for increasing -velocity ratio	(d) all of the above

131	Hooke's law holds good up to	
	(a) yield point	(b) limit of proportionality
	(c) breaking point	(d) elastic limit
132	Young's modulus is defined as the ratio of	
	(a) volumetric stress and volumetric strain	(b) lateral stress and lateral strain
	(c) longitudinal stress and longitudinal strain	(d) shear stress to shear strain
133	The impact strength of a material is an index of its	
	(a) toughness	(b) tensile strength
	(c) capability of being cold worked	(d) hardness
134	Which of the following has no unit	
	(a) kinematic viscosity	(b) surface tension
	(c) bulk modulus	(d) strain
135	The value of Poisson's ratio for cast iron is	
	(a) 0.1 to 0.2	(b) 0.23 to 0.27
	(c) 0.25 to 0.33	(d) 0.4 to 0.6
136	The maximum strain energy that can be stored in a body is known as	
	(a) impact energy	(b) resilience
	(c) proof resilience	(d) modulus of resilience
137	The unit of force in S.I. units is	
	(a) kilogram	(b) newton
	(c) watt	(d) dyne
138	Coulomb friction is the friction between	
	(a) bodies having relative motion	(b) two dry surfaces
	(c) two lubricated surfaces	(d) solids and liquids
139	Tangent of angle of friction is equal to	
	(a) kinetic friction	(b) limiting friction
	(c) angle of repose	(d) coefficient of friction
140	High speed steel tools retain their hardness up to a temperature of	
	(a) 250°C	(b) 350°C
	(c) 500°C	(d) 900°C
141	Work study is concerned with	
	(a) improving present method and finding standard time	(b) motivation of workers
	(c) improving production capability	(d) improving production planning and control
142	Drilling is an example of	
	(a) Orthogonal cutting	(b) Oblique cutting
	(c) Simple cutting	(d) Uniform cutting
143	Job evaluation is the method of determining the	
	(a) relative worth of jobs	(b) skills required by a worker
	(c) contribution of a worker	(d) contribution of a job

144	Gantt chart provides information about the	
	(a) material handling	(b) proper utilisation of manpower
	(c) production schedule	(d) efficient working of machine
145	ABC analysis deals with	
	(a) analysis of process chart	(b) flow of material
	(c) ordering schedule of job	(d) controlling inventory costs money
146	PERT is the	
	(a) time oriented technique	(b) event oriented technique
	(c) activity oriented technique	(d) target oriented technique
147	Centrifugal pump is started with its delivery valve	
	(a) kept fully closed	(b) kept fully open
	(c) irrespective of any position	(d) kept 50% open
148	Francis turbine is best suited for	
	(a) medium head application from 24 to 180 m	(b) low head installation up to 30 m
	(c) high head installation above 180m	(d) all types of heads
149	Reaction turbines are used for	
	(a) low head	(b) high head
	(c) high head and low discharge	(d) low head and high discharge.
150	The undesirable property of a refrigerant is	
	(a) Non-toxic	(b) Non-flammable
	(c) Non-explosive	(d) High boiling point



SUITABILITY TEST FOR THE POST OF JE/MECHANICAL ON COMPASSIONATE GROUNDS

Total marks : 150

Duration : 2 hours

Date: 29.02.20

Answer all the questions

No negative marks for wrong answers

Calculator and any other electronic devices are not allowed:

I – General Awareness and General Knowledge:

1	The color of a star indicates its _____ ? (a) Distance (c) Mass	(b) Luminosity (d) Temperature
2	Which organisation monitors the banks in actually maintaining cash balance? (a) Grameen Bank of India (c) State Bank of India	(b) Reserve Bank of India (d) None of these
3	Which gas is most popular as laughing gas? (a) Carbon di oxide (c) Nitrous oxide	(b) Ammonia (d) Carbon mono oxide
4	The Mandal Commission was constituted during the tenure of which among the following Prime Ministers? (a) Indira Gandhi (c) Rajiv Gandhi	(b) Morarji Desai (d) V P Singh
5	What is the full form of IMF? (a) International Mens Federation (c) International Monetary Funds	(b) Indian Maritime Federation (d) Indian Monetary Funds
6	Which all three items are not under GST as of February 2020? (a) Fuel, Construction, Alcohol (c) Fuel, Movie Tickets, Alcohol	(b) Fuel, Tobacco, Alcohol (d) Fuel, Tobacco, Dairy Products
7	The first battle of Panipat took place in which year? (a) 1652 (c) 1656	(b) 1526 (d) 1562
8	Which state of India is famously known as "God's Own Country"? (a) Himachal Pradesh (c) Kerala	(b) Assam (d) Goa
9	What is the highest incometax rate slab in India after Budget 2020-21? (a) 25% (c) 35%	(b) 30% (d) 40%
10	What is the staple food of one third of the world's total population? (a) Rice (c) Potato	(b) Wheat (d) Meat
11	The Head Quarters of United Nations Organization is situated at? (a) Paris (c) New Delhi	(b) London (d) New York
12	Mary Kom is famous for? (a) Shotput (c) Boxing	(b) Wrestling (d) Athletet

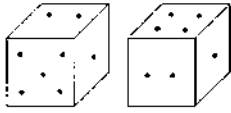
13	The Denque fever is caused by which of the following?	
	(a) Mosquitos	(b) Flies
	(c) Dogs	(d) Rats
14	Which of the following three R's are regarded as environment friendly?	
	(a) Reduce-Reuse-Reutilize	(b) Recollect-Reuse-Reutilize
	(c) Reduce-Reuse-Recycle	(d) Reduce-Renew-Reutilize
15	The executive power of the Indian Union lies with which of the following?	
	(a) Prime Minister	(b) Council of Ministers
	(c) President	(d) Speaker
16	What is the function of a fuse wire?	
	(a) To prevent an unduly high electric current from passing through a circuit	(b) To increase the current supply
	(c) To decrease the current supply	(d) To stabilise the voltage
17	Where is India's first indigenously developed 500-Megawatt (MW) prototype fast breeder reactor located?	
	(a) Kalpakkam	(b) Koodankulam
	(c) Tharapur	(d) Kaiga
18	The height of Mount K2 is?	
	(a) 8116 m	(b) 8448 m
	(c) 8848 m	(d) 8611 m
19	The filament of an electric bulb is made of which metal?	
	(a) Vanadium	(b) Tungsten
	(c) Nickel	(d) Copper
20	What is the name of the ancient route between India and China?	
	(a) Gold road	(b) Diamond road
	(c) Silk road	(d) Platinum road
21	Why soaps do not work in hard water?	
	(a) The water tastes bitter and it has an unpleasant smell	(b) The water is hard to boil and the soap only works in boiled water
	(c) The insoluble soaps formed separate as scum in water	(d) The hard water has lot of impurities
22	Pandit Ravi Shankar the Indian musician and composer is famous for...	
	(a) Guitar	(b) Tabla
	(c) Violin	(d) Sitar
23	Viper Venom contains?	
	(a) Haemo toxins.	(b) Neuro toxins.
	(c) Both (a) and (b)	(d) None of the above
24	Which country is having the highest population in the world?	
	(a) India	(b) China
	(c) United States of America	(d) Russia
25	Name of the border line between India and China is	
	(a) Radcliff	(b) MacMohan
	(c) Palk Strait	(d) None of the above

11 – Arithmetic:

26	The difference between the place value and the face value of 6 in the numeral 956281 is	(a) 281	(b) 6281
		(c) 5994	(d) None of the above
27	Square root of 2 is	(a) 1.2131	(b) 1.732
		(c) 1.4142	(d) 1
28	$6524 - ? = 8329 - 4529$	(a) 2724	(b) 2472
		(c) 2274	(d) 7422
29	If the number $5k2$ is divisible by 6, then $k=?$	(a) 2	(b) 3
		(c) 6	(d) 7
30	$3 - 7 \times 5 - 40 \div 2 = ?$	(a) 10	(b) 8
		(c) -8	(d) -5
31	How many prime numbers are less than 50 ?	(a) 14	(b) 15
		(c) 16	(d) 17
32	If X and Y are odd numbers, then which of the following is odd?	(a) $X+Y$	(b) $X-Y$
		(c) $X+Y+1$	(d) $XY+1$
33	A man travels 10 km north and 3 km towards east and then 14 km towards south. How far he is from the starting point?	(a) 4 km	(b) 2 km
		(c) 5 km	(d) 3 km
34	The sum of the two numbers is 9 and their product is 14. What is the sum of the reciprocals of these numbers ?	(a) $9/14$	(b) $7/9$
		(c) $14/9$	(d) $2/7$
35	If $2A=3B=4C$ then A:B:C is:	(a) 6:4:3	(b) 3:4:6
		(c) 4:3:6	(d) 6:3:4
36	The ratio 3 : 4 expressed as a percent equals :	(a) 12.5%	(b) 75%
		(c) 40%	(d) 80%
37	860% of 100 – 100% of 860 = ?	(a) 9460	(b) 1720
		(c) 860	(d) 960
38	What must be added to each term of the ratio 13 : 7 so that the ratio becomes 3 : 2 ?	(a) 3	(b) 4
		(c) 5	(d) 2

39	A and B can together do a piece of work in 10 days. B alone can do it in 15 days. In how many days can A alone do it?	
	(a) 30 days	(b) 35 days
	(c) 45 days	(d) 25 days
40	$0.0^2 + 5.0^2 \times 0.0^2 + 0.6^2$	
	(a) 0.694	(b) 0.833
	(c) 0.000	(d) 1.000
41	An agent gets a commission of 2.5% on the sales of cloth. If on a certain day, he gets Rs. 12.50 as commission, the cloth sold through him on that day is worth	
	(a) Rs. 500	(b) Rs. 250
	(c) Rs. 1250	(d) Rs. 750
42	4, 7, 12, P, 28, 39... What is the value of P in the series?	
	(a) 28	(b) 20
	(c) 19	(d) 17
43	Five years ago Suja's age was one-third of the age of Devi and now Suja's age is 17 years. What is the present age of Devi?	
	(a) 36 years	(b) 9 years
	(c) 41 years	(d) 51 years
44	The total of the ages of Amar, Akbar and Anthony is 80 years. What was the total of their ages three years ago?	
	(a) 71 years	(b) 72 years
	(c) 74 years	(d) 77 years
45	A bag has 8 Red balls, 5 Green balls and 3 White balls. What part of the balls are white?	
	(a) 15	(b) 1/5
	(c) 1/3	(d) 3
46	A student got twice as many sums wrong as he got right. If he attempted 48 sums in all, how many did he solve correctly ?	
	(a) 12	(b) 16
	(c) 18	(d) 24
47	How many times a man run around a square plot of land of side 25 m to cover a distance of 5 Km?	
	(a) 10	(b) 40
	(c) 50	(d) 30
48	In a group of cows and hens, the number of legs are 14 more than twice the number of heads. The number of cows is	
	(a) 5	(b) 7
	(c) 10	(d) 12
49	At simple interest, a sum doubles after 20 years. The rate of interest per annum is	
	(a) 5%	(b) 10%
	(c) 12%	(d) 15%
50	A rectangular floor with dimensions 12m X 10m is to be paved with square tiles of side 50 cm. The number tiles required to cover the floor is?	
	(a) 420	(b) 240
	(c) 480	(d) 280

III -- General Intelligence and Reasoning:

51	Arrange the words given below in a meaningful sequence. 1.Key 2.Door 3.Lock 4.Room 5.Switch on	
	(a) 5, 1, 2, 4, 3	(b) 4, 2, 1, 5, 3
	(c) 1, 3, 2, 4, 5	(d) 1, 2, 3, 5, 4
52	The odd person among the following is	
	(a) Sachin Tendulkar	(b) Mahesh Boopathi
	(c) Vijender Singh	(d) Ranveer Singh
53	Error : Mistake	
	(a) Music : Art	(b) Connection : Retaliation
	(c) Literature : Poetry	(d) Doubt : Suspicion
54	Pointing to a photograph of a boy Priya said, "He is the son of the only Daughter of my mother." How is Priya related to that boy?	
	(a) Sister	(b) Aunt
	(c) Niece	(d) Mother
55	Flow : River :: Stagnant : ?	
	(a) Rain	(b) Stream
	(c) Pool	(d) Canal
56	DANGER : ADNGRE :: HUNGRY : ?	
	(a) HNUGRY	(b) UNHGYR
	(c) YRNGUH	(d) UHNGYR
57	Choose the word which is different from the rest.	
	(a) Chicken	(b) Snake
	(c) Swan	(d) Crocodile
58	Two positions of dice are shown below. How many points will appear on the opposite to the face containing 5 points?	
		
	(a) 3	(b) 4
	(c) 2	(d) 1
59	Study the Pattern and complete the series: BCB, DED, FGF, HHH, ----?----	
	(a) JKJ	(b) HJH
	(c) IJI	(d) JHJ
60	2, 5, 26, ?	
	(a) 527	(b) 267
	(c) 677	(d) 253

IV- Technical Ability:

61	According to Avogadro's Hypothesis	
	(a) The molecular weights of all the perfect gases occupy the same volume under same conditions of pressure and temperature	(b) The sum of partial pressure of mixture of two gases is sum of the two
	(c) Product of the gas constant and the molecular weight of an ideal gas is constant	(d) Gases have two values of specific heat

62	Which of the following item is not a path function?	
	(a) Heat	(b) Work
	(c) Kinetic energy	(d) Thermal conductivity
63	The amount of heat required to raise the temperature of-----water through one degree is called Kilojoules	
	(a) 1g	(b) 10g
	(c) 100g	(d) 1000g
64	For the same maximum Pressure and Temperature,	
	(a) Otto cycle is more efficient than Diesel cycle	(b) Diesel cycle is more efficient than Otto cycle
	(c) Dual cycle is more efficient than Otto and Diesel cycles	(d) Dual cycle is less efficient than Otto and Diesel cycles
65	Work done is zero for the following process	
	(a) constant volume	(b) free expansion
	(c) throttling	(d) all of the above
66	The following cycle is used for air craft refrigeration	
	(a) Brayton Cycle	(b) Joule Cycle
	(c) Carnot Cycle	(d) Reversed Brayton Cycle
67	One Watt is equal to	
	(a) 1 Nm/s	(b) 1 N/m
	(c) 1 Nm/hr	(d) 1 kNm/hr
68	The specific heat of air increases with increase in	
	(a) Temperature	(b) Pressure
	(c) Both Temperature and Pressure	(d) Variation of its constituents
69	Kelvin-Planck's Law deals with	
	(a) Conservation of work	(b) Conservation of heat
	(c) Conversion of heat into work	(d) Conversion of work into heat
70	Total heat of a substance is also known as	
	(a) Internal energy	(b) Entropy
	(c) Thermal capacity	(d) Enthalpy
71	A fluid is said to be ideal, if it is	
	(a) Incompressible	(b) Inviscous
	(c) Viscous and incompressible	(d) Inviscous and incompressible
72	Density of water is maximum at	
	(a) 0°C	(b) 0°K
	(c) 4°C	(d) 100°C
73	Which of the following is dimensionless	
	(a) specific gravity	(b) specific volume
	(c) specific viscosity	(d) specific weight
74	The viscosity of water is _____ than that of mercury.	
	(a) Higher	(b) Lower
	(c) Same as	(d) None of these

