NATIONAL INSTITUTE OF WIND ENERGY

(Ministry of New and Renewable Energy, Government of India)
Velachery – Tambaram Main Road, Pallikaranai, Chennai

Code
M

Recruitment of Junior Engineer (Regular) – Question Booklet

Roll No.	
Date	
Time	
Duration	2 Hours
Maximum Marks	120
Signature of the Invigilator	

SEAL

INSTRUCTIONS TO CANDIDATES

Read the following instructions before you start answering the questions.

1. The questions for the examinations are multiple choice (objective type).
2. All the questions are to be answered.
3. Each question carries one mark.
4. Maximum marks for the paper / written test is 120.
5. Black or Blue Ball point pen should be used for answering.
6. There will be four suggested answers (a), (b), (c) and (d) to each question, out of which only one is the correct answer. The correct answer should be shaded in the OMR Answer sheet provided.
7. Questions not answered will carry no mark. Wrong answers for multiple choice questions will result in ***NEGATIVE MARKS***. For every wrong answer, one – fourth mark will be deducted.
8. The Roll Number should be written in the booklet and in the OMR Answer Sheet.
9. Any rough work may be done on the rough work page provided at the end of the booklet.
10. Answer sheet and Question Booklet should be returned to the Hall Invigilator at the end of the Examination.

PART – I – GENERAL APTITUDE

1. 'If the height of a given cone be doubled and radius of base remains the same, the ratio of the volume of the given cone to that the second cone will be

   a) 2:1 b) 1:8 c) 1:2 d) 8:1

2. A sphere and a cylinder have equal volume and equal radius. The ratio of the curved surface area of the cylinder to that of the sphere is

   a) 4:3 b) 2:3 c) 3:2 d) 3:4

3. The speed of a bus is 72 km / h. The distance covered by the bus in 5 s is

   a) 50 m b) 74.5 m c) 100 m d) 60 m

4. If 10 men or 20 boys can make 260 mats in 20 days, then how many mats will be made by 8 men and 4 boys in 20 days?

   a) 250 b) 280 c) 255 d) 260

5. A chair is sold for Rs.705/- at a gain of 6%. Find its cost price.

   a) Rs.666 b) Rs.670 c) Rs.$665\frac{5}{53}$ d) Rs.680

6. The simple interest on a certain sum of money for $2\frac{1}{3}$ year at $8\frac{1}{3}$ % per annum is Rs.560. Then, find the sum.

   a) Rs.2880 b) Rs.2800 c) Rs.8880 d) Rs.8280

7. If the price of the cooking gas increased by 15%, by how many per cent should a family reduce its consumption so as not to exceed its budget on cooking gas?

   a) 14 % b) 13 % c) 17 % d) $13\frac{1}{23}$ %

8. Among how many children may 429 mangoes and also 715 oranges be equally divided?

   a) 143 b) 123 c) 152 d) 160

9. Solve 42 ÷0.007

   a) 600 b) 6000 c) 60000 d) None of these

10. What is the least number to be added to 4700 to make it a perfect square?

    a) 74 b) 69 c) 76 d) 61

11. What should come in place of the question mark (?) in the following number series?

3 7 13 ? 31 43

a) 18 b) 19 c) 23 d) 21

12. The radius of the internal and external surfaces of a hollow spherical shell are 3 cm and cm respectively. If it is melted and recast into a solid cylinder of height $2\frac{2}{3}$ cm. What the diameter of the cylinder?

a) 12 cm b) 7 cm c) 14 cm d) None of these

13. Which fraction comes next in the sequence $\frac{1}{2}, \frac{3}{4}, \frac{5}{8}, \frac{7}{16}, ?$

a) $\frac{9}{32}$ b) $\frac{10}{17}$ c) $\frac{11}{34}$ d) $\frac{12}{35}$

14. $\frac{2}{\sqrt{5}}, \frac{3}{5}, \frac{4}{5\sqrt{5}}, \frac{5}{25}, ?$

a) $\frac{6}{5\sqrt{5}}$ b) $\frac{6}{25\sqrt{5}}$ c) $\frac{6}{125}$ d) $\frac{7}{25}$

15. In the series 3, 9, 15, ..., what will be the 21^{st} term?

a) 117 b) 121 c) 123 d) 129

16. Pointing towards Rita, Nikhil said, ï am he only son of her mother's son."How is Rita related to Nikhil?

a) Aunt b) Niece c) Mother d) Cousin

17. Kailash faces towards north. Turning to his right, he walks 25 metres. He then turns to his left and walks 30 metres. Next he moves 25 metres to his right. He then turns to his right again and walks 55 metres. Finally, he turns to the right and moves 40 metres. In which direction is he now from his starting point?

a) South-West b) South c) North-West d) South-East

18. Laxman went 15 kms to the west from my house, then turned left and walked 20 kms. He then turned East and walked 25 kms and finally turning left covered 20 kms. How far was he from his house?

a) 5 kms b) 10 kms c) 40 kms d) 80 kms

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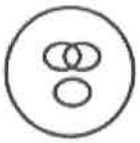
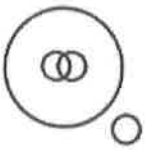
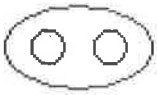
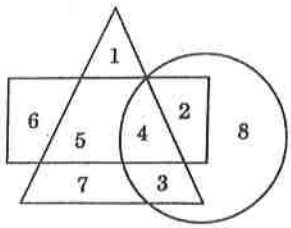
19. In a dinner party both fish and meat were served. Some took only fish and some only meat. There were some vegetarians who did not accept either. The rest accepted both fish and meat. Which of the following logic diagrams correctly reflects this situation?

a)  b)  c)  d) 

20. Which of the following diagrams indicates the best relation between Sweets, Rasagulla and Apple ?

a)  b)  c)  d) 

21. Which number is in all the geometrical figures?



a) 3 b) 4 c) 5 d) 8

22. How many 5s are there in the following number sequence which are immediately preceded by 7 and immediately followed by 6?

7 5 5 9 4 5 7 6 4 5 9 8 7 5 6 7 6 4 3 2 5 6 7 8

a) One b) Two c) Three d) Four

23. The positions of the first and the second digits in the number 9 4 3 1 6 8 7 5 are interchanged. Similarly, the positions of the third and fourth digits are interchanged and so on. Which of the following will be the third to the left of the seventh digit from the left end after the rearrangement?

a) 3 b) 4 c) 6 d) 1

24. In the numbers from 100 to 1000, how many times digit 1 comes at the ten's place?

a) 9 b) 10 c) 90 d) 900

25. In a row of boys, A is fifteenth from the left and B is fourth from the right. There are three boys between A and B. C is just left of A. What is C's position from the right?

a) 9^{th} b) 10^{th} c) 12^{th} d) 13^{th}

26. Hari is 16^{th} from the left end in a row of boys and Vivek is 18^{th} from the right end. Gugan is 11^{th} from Hari towards the right and 3^{rd} from Vivek towards the right end. How many boys are there in the row?

a) 40 b) 42 c) 48 d) 41

27. If 30^{th} January 2019 was Wednesday, what was the day on 3^{rd} March, 2019?

a) Tuesday b) Thursday c) Saturday d) Sunday

28. Kumar left home for the bus stop 15 minutes earlier than usual. It takes 10 minutes to reach the stop. He reached the stop at 8.40 a.m. What time does he usually leave home for the bus stop?

a) 8.30 a.m b) 8.45 p.m. c) 8.55 a.m. d) 8.45 a.m.

29. Reaching the place of meeting 20 minutes before 8.50 hrs Sumit found himself thirty minutes earlier than the man who came 40 minutes late. What was the scheduled time of the meeting?

a) 8.00 b) 8.05 c) 8.10 d) 8.20

30. If + means x, x means -, ÷ means + and – means ÷, then which of the following gives the result of 175 – 25 ÷ 5 + 20 x 3 + 10 ?

a) 77 b) 160 c) 240 d) 2370

31. Reena is twice as old as Sunita. Three years ago, she was three times as old as Sunita. How old is Reena now?

a) 6 years b) 7 years c) 8 years d) 12 years

32. A shepherd had 17 sheep. All but nine died. How many was he left with?

a) Nil b) 8 c) 9 d) 17

33. What is the product of all the numbers in the dial of a telephone?

a) 1,58,480 b) 1,59,450 c) 1,59,480 d) None of these

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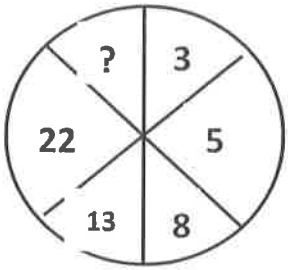
34. Find the missing number



a) 1 b) 26 c) 39 d) 45

35. In a city, 40% of the adults are illiterate while 85% of the children are literate. If the ratio of the adults to that of the children is 2 : 3, then what percent of the population is literate?

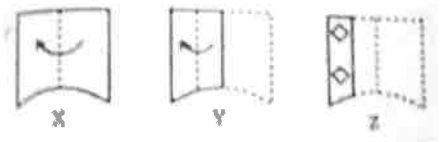
a) 20% b) 25% c) 50% d) 75%

36. Two bus tickets from city A to B and three tickets from city A to C cost Rs.77 but three tickets from city A to B and two tickets from city A to C cost Rs.73. What are the fares for cities B and C from A ?

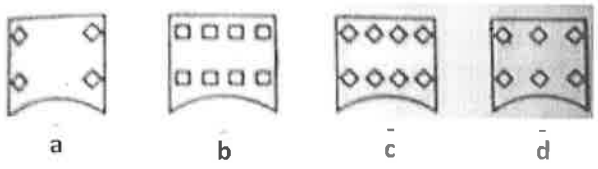
a) Rs.4, Rs.23 b) Rs.13, Rs.17 c) Rs.15, Rs.14 d) Rs.17, Rs.13

37. Given figures X, Y, Z shows a sequence of folding a piece of paper. Fig. (Z) shows the manner in which the folded paper has been cut. Select a answer figure which would most closely resemble the unfolded form of fig.(Z).

Problem figures



Answer figures

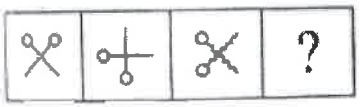


38. Count the number of cubes in the given figure.

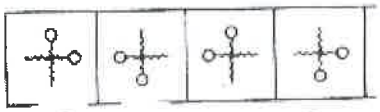
a) 14 b) 12 c) 10 d) 8

39. There is a definite relationship between figure 1 and 2. Establish a similar relationship between figures 3 and 4 by selecting a suitable figure from the Answer set that would replace the question mark (?) in fig 4.

Problem figure

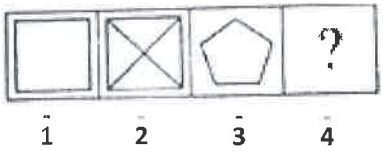


Answer figure

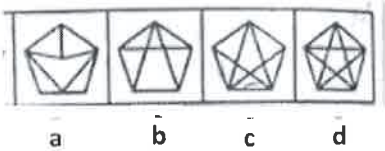


40. There is a definite relationship between figure 1 and 2. Establish a similar relationship between figures 3 and 4 by selecting a suitable figure from the Answer set that would replace the question mark (?) in fig 4.

Problem figure



Answer figure



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PART – II – CORE ENGINEERING: MECHANICAL

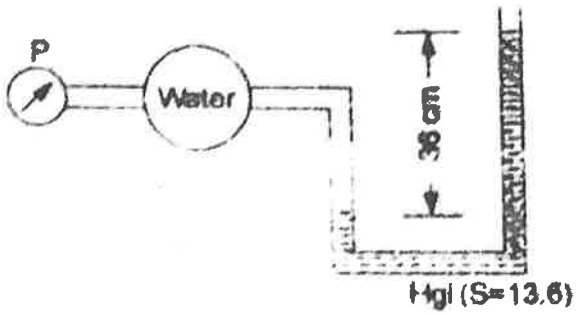
41. A small plastic boat loaded with pieces of steel rods is floating in a bath tub. If the cargo is dumped into the water allowing the boat to float empty, the water level in the tub will

    a) rise b) fall c) remains same d) rise and then fall

42. Steady flow occurs when

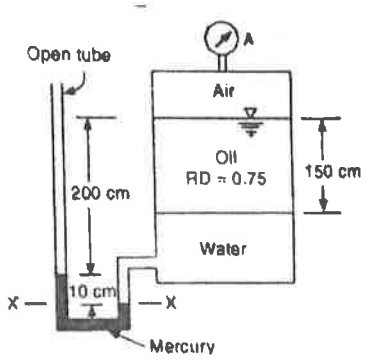
    a) Pressure does not change along the flow
    b) Velocity does not change
    c) Conditions change gradually with time
    d) Conditions do not change with time at any point

43. In the given figure pressure p, in kPa, is



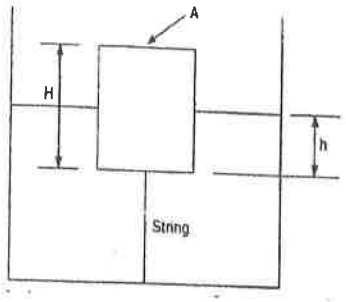
    a) 51.3 b) 48.0 c) 45.2 d) 30.0

44. The tank shown in the figure below is closed at top and contains air at a pressure p_A. The value of p_A for the manometer readings shown will be



    a) -3.573 kPa b) -4.573 kPa c) -6.573 kPa d) -7.573 kPa

45. A cylindrical body of cross-sectional area A height H and density ρ_s, is immersed to depth h in a liquid of density ρ, and tied to the bottom with a string. The tension in t string is

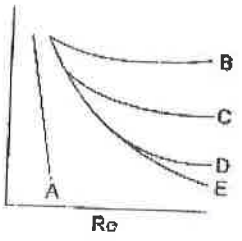


a) $\rho gh\ A$ b) $(\rho_s - \rho)\ ghA$ c) $(\rho - \rho_s)\ ghA$ d) $(\rho h - \rho_{sH})\ gA$

46. The fluid forces considered in the Navier Stokes equation are

a) gravity, pressure and viscous
b) gravity, pressure and turbulent
c) pressure, viscous and turbulent
d) gravity, viscous and turbulent

47. In the Mody diagram shown in the figure below, friction factor for turbulent flow in a smooth pipe is given by the curve



a) A b) B c) C d) D

48. For laminar flow in a pipe, V is equal to

a) U_{max} b) $0.5\ U_{max}$ c) $0.25\ U_{max}$ d) $2\ U_{max}$

49. Water flow through a 0.6 m diameter, 1000m long pipe from a 30 m over head tank to a village and find discharge (in litres) at the village (at ground level), assuming fanning friction factor f=0.04 and ignoring minor losses due to bends etc.

a) 218 lit/sec b) 318 lit/sec c) 418 lit/sec d) 618 lit/sec

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50. The flow of water in a pipe of diameter 3000 mm can be measured by

a) Venturimeter b) Rotameter c) Pilot tube d) Orifice plate

51. Buoyant force is

a) resultant of upthrust and gravity forces acting on the body
b) resultant force on the body due to the fluid surrounding it
c) resultant of static weight of body and dynamic thrust of fluid
d) equal to the volume of liquid displaced by the body

52. Process of diffusion of one liquid into other through a semi-permeable membrane is called

a) viscosity b) osmosis c) surface tension d) cohesion

53. In equilibrium condition, fluids are not able to sustain

a) shear force
b) resistance to viscosity
c) surface tension
d) geometric similitude

54. Cavitation is caused by

a) high velocity
b) low barometric pressure
c) high pressure
d) low pressure

55. The coefficient of discharge (C_d) of an orifice varies with

a) Reynold number
b) Weber number
c) Froude number
d) Mach number

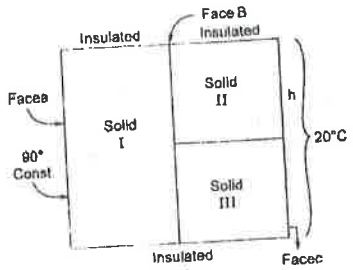
56. Flow occurring in a pipeline when a valve is being opened is

a) steady b) unsteady c) laminar d) vortex

57. Ratio between inertial forces and the square root of pressure forces is known as

a) Euler number b) Weber number c) Froude number d) Mach number

58. For the situation below, what would happen to the average temperature at face C if the thermal conductivity of solid II was increased?



a) No change b) Becomes 20°C c) Increase d) Decrease

59. Heat pipe is widely used now-a-days because it acts as

a) an insulator
b) conductor & insulator
c) a superconductor
d) a fin

60. Fin efficiency deals with

a) thermal performance
b) economical material requirement
c) cost of manufacturing
d) all of these

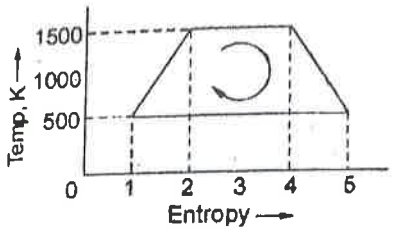
61. The Carnot cycle consists of two reversible adiabatic processes and

a) two reversible isothermal processes
b) two reversible constant pressure processes
c) two reversible constant volume processes
d) one reversible constant pressure processes

62. Which one of the following pairs best expresses a relationship similar to that expressed in the pair 'pressure-volume' for a thermodynamic system undergoing a process?

a) Enthalpy-entropy
b) Pressure-enthalpy
c) Pressure-temperature
d) Temperature-entropy

63. The efficiency of a reversible cyclic process undergone by a substance as shown in the given diagram is



a) 0.40 b) 0.55 c) 0.66 d) 0.80

64. For the same compression ratio, the efficiency of diesel cycle as compared to otto cycle is

a) less b) more c) equal d) none of the above

65. Subcooling occurs when the vapour

a) has high latent heat
b) removes sensible heat from refrigerant
c) has low latent heat
d) has high thermal conductivity

66. The wet bulb temperature at 100% relative humidity as compared to dew point temperature is

a) same b) lower c) higher d) unpredictable

67. Total pressure exerted by a mixture of gases or vapours is equal to the sum of partial pressures which each gas will exert independent of the others. This statement is known as

a) Newton's law of gases
b) Kinetic theory of gases
c) Avagadro's hypothesis
d) Dalton's law of partial pressure

68. From a metallic wall at 100° C, a metallic rod protrudes to the ambient air. The temperature at the tip will be minimum when the rod is made of

a) aluminium b) steel c) copper d) silver

69. For a given heat flow and for the same thickness, the temperature drop across the material will be maximum for

a) copper b) steel c) glass-wool d) refractory brick

70. Ratio of mass heat flow rate to the heat flow rate by conductions under a unit temperature gradient and through a thickness, is known as

a) Reynolds number
b) Prandtl number
c) Placelent number
d) Stanton number

71. In a pulverised-fuel-fired large power boiler, the heat transfer from the burning fuel to the walls of the furnace is

a) by conduction only
b) by convection only
c) by conduction and convection
d) predominantly by radiation

72. Temperatures near absolute zero are obtained using

a) Peltier effect
b) Thermionic emission
c) Azeotropes
d) Magnetic cooling

73. Film coefficient is the ratio of

a) thickness of film of fluid to thermal conductivity
b) thickness of film of fluid to temperature drop through film of fluid
c) thermal conductivity to temperature drop through film of fluid
d) thermal conductivity to equivalent thickness of film of fluid

74. Relation between the emissive and absorptive power of a body is given by

a) Wein's law b) Stefan's law c) Kirchoff's law d) Planck's law

75. The purpose of adding wood flour or saw dust to foundry sand is to improve

a) mouldability b) dry strength c) hot strength d) collapsibility

76. Accuracy of shell moulding is of the order of

a) 0.001 m/m b) 0.003 to 0.005 m/m c) 0.01 m/m d) 0.1 m/m

77. Sprue in casting refers to

a) gate b) runner c) riser d) vertical passage

78. In single V-butt welds, the angle between edges is kept about

a) 40° to 50° b) 50° to 60° c) 60° to 70° d) 70° to 90°

79. In electrical resistance welding, voltage required for heating is in the range

a) 1 to 5 volts b) 6 to 10 volts c) 11 to 15 volts d) 16 to 20 volts

80. Most commonly used flame in gas welding is

a) neutral b) oxidising c) carburising d) all of these

81. Angle made by the face of tool and the plane parallel to the base of the cutting tool is called

a) Lip angle b) rake angle c) cutting angle d) clearance angle

82. Which of the following tool materials has highest cutting speed?

a) carbon steel b) tool steel c) HSS d) carbide

83. The key features of MRP system are

a) Planned order releases
b) Time-phasing of requirements
c) Provisions for rescheduling
d) All of these

84. True centrifugal casting is used to get

a) accurate castings
b) dynamically balanced castings
c) statically balanced castings
d) chilled castings

85. The most suitable material for die casting is

a) steel
b) cast iron
c) nickel
d) copper

86. Draft on pattern for casting is

a) shrinkage allowance
b) identification number marked on it
c) taper to facilitate its removal from mould
d) for machining allowance

87. In electrical resistance welding

a) voltage is high and current is low
b) voltage is low and current is high
c) both voltage and current are high
d) both voltage and current are low

88. Welding of steel structures on site of a building is done by

a) spot welding
b) projection welding
c) seam welding
d) arc welding

89. Welding process using non-consumable electrodes is

a) Laser welding
b) MIG welding
c) TIG welding
d) Ion beam welding

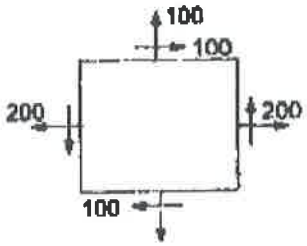
90. To prevent tool from rubbing the work, angle provided on tools is

a) Lip angle
b) rake angle
c) clearance angle
d) relief angle

91. Tool life is most affected by

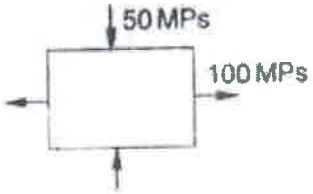
a) Cutting speed
b) tool geometry
c) feed and depth
d) microstructure of material being cut

92. The value of the maximum shear stress will be



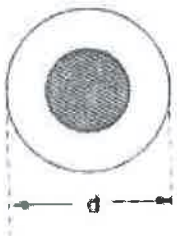
a) $25\sqrt{5}$ b) $50\sqrt{5}$ c) $100\sqrt{5}$ d) $200\sqrt{5}$

93. For the state of stress shown in the given figure, normal stress acting on the plane of maximum shear stress is



a) 25 MPa compression b) 75 MPa compression
c) 25 MPa tension d) 75 MPa tension

94. A beam of circular cross-section of diameter 'd' is subjected to an eccentric compressive load of eccentricity 'e'. In order that the tensile stress induced is zero, the limiting region for application of the load should be the shaded concentric circle of diameter



a) $\frac{d}{3}$ b) $\frac{d}{4}$ c) $\frac{d}{6}$ d) $\frac{d}{8}$

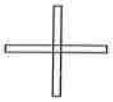
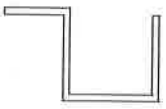
95. A small element at the critical section of a component is in a bi-axial state of stress with the two principal stresses being 360 MPa and 140MPa. The maximum working stress according to Distortion Energy Theory is

a) 220MPa b) 110 MPa c) 314 MPa d) 330 MPa

96. Under torsion, brittle materials generally fail

a) Along a plane perpendicular to its longitudinal axis
b) In the direction of minimum tension
c) Along surfaces forming a 45° angle with the longitudinal axis
d) Not in any specific manner

97. Which one of the following combinations of angles will carry the maximum load as a column?

a)  b)  c)  d) 

98. For a circular column having its ends hinged, the slenderness ratio is 160. The L / d ratio of the column is

a) 80 b) 57 c) 40 d) 20

99. The 'Euler' load for a column is 1000 kN and crushing load is 1500kN. The 'Rankine' load is equal to

a) 600 kN b) 1000 kN c) 1500 kN d) 2500 kN

100. Consider the following theories of failure:

1) Maximum stress theory
2) Maximum strain theory
3) Maximum shear stress theory
4) Maximum energy or distortion theory

The most suitable for ductile material is

a) 1 & 2 b) 1 & 3 c) 1 & 4 d) 3 & 4

101. For ductile materials, the most appropriate failure theory is

a) Maximum shear most conservative stress theory
b) Maximum principal stress theory
c) Maximum principal strain theory
d) Shear strain energy theory

102. The shear stress distribution over a rectangular cross-section of a beam follows

a) a straight line path
b) a circular path
c) a parabolic path
d) an elliptical path

103. For the two shafts connected in parallel, find which statement is true?

a) Torque in each shaft is the same
b) Shear stress in each shaft is the same
c) Angle of twist of each shaft is the same
d) Torsional stiffness of each shaft is the same

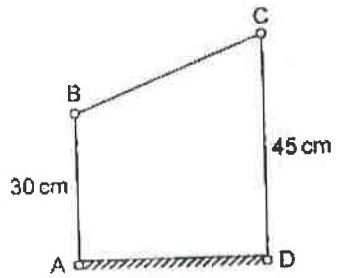
104. The buckling load will be maximum for a column, if

a) one end of the column is clamped and the other end is free
b) both ends of the column are clamped
c) both ends of the column are hinged
d) one end of the column is hinged and the other end is free

105. Inversion of a mechanism is

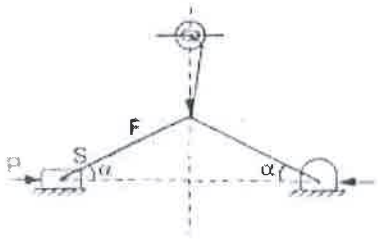
a) Changing of a higher pair to lower pair
b) Obtained by fixing different links in a kinematic chain
c) Turning it upside down
d) Obtained by reversing the input and output motion

106. ABCD is a four-bar mechanism in which AB = 30 cm and CD = 45 cm. AB and CD are both perpendicular to fixed link AD, as shown in the figure. If velocity of B at this condition is V, then velocity of C is



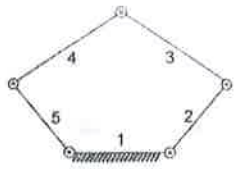
a) V b) $\frac{3}{2}$ V c) $\frac{9}{4}$ V d) $\frac{2}{3}$ V

107. With reference to the mechanism shown in the figure, the relation between F and P is



a) F = 0.5 P . tan α
b) F = P . tan α
c) P = 2F . tan α
d) F = 2P . tan α

108. The number of degrees of freedom of a five link plane mechanism with five revolute pairs as shown in the figure is



a) 3 b) 4 c) 2 d) 1

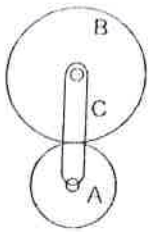
109. Consider the following statements

1) A round bar in a round hole form a turning pair
2) A square bar in a square hole forms a sliding pair
3) A vertical shaft in a footstep bearing forms a successful constraint

Of these statements

a) 1 and 2 are correct
b) 2 and 3 are correct
c) 1 and 3 are correct
d) 1, 2 and 3 are correct

110. A single epicyclic gear train is shown in the given figure. Wheel A is stationary. If the number of teeths on A and B are 120 and 45 respectively, then when B rotates about its own axis with speed of 27rpm, the speed of C would be

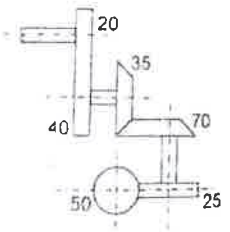


a) 20 rpm b) $27\frac{3}{11}$ rpm c) $19\frac{7}{11}$ rpm d) 100 rpm

111. A fixed gear having 100 teeth meshes with another gear having 25 teeth, the centre lines of both the gears being joined by an arm so as to form an epicyclic gear train. The number of rotations made by the smaller gear for one rotation of the arm is

a) 3 b) 4 c) 5 d) 6

112. A compound train consisting of spur, bevel and spiral gears is shown in the figure along with the teeth numbers marked against the wheels. Overall speed ratio of the train is



a) 8 b) 2 c) $\frac{1}{2}$ d) $\frac{1}{8}$

113. A bicycle remains stable in running through a bend because of

a) Gyroscopic action
b) Corioliss' acceleration
c) Centrifugal action
d) Radius of curved path

114. In gears, interference takes place when

a) Tip of a tooth of a mating gear digs into the portion between base and root circle
b) Gears do not move smoothly in the absence of lubrication
c) Pitch of the gear is not same
d) Gear teeth are undercut

115. In an automobile service station, an automobile is in a lifted up position by means of a hydraulic jack. A person working in the service station gives a tap to one rear wheel and make it rotate b one revolution. The rotation of another rear wheel is

a) Zero
b) Also one revolution in the same direction
c) Also one revolution but in the opposite direction
d) Unpredictable

116. The tooth profile most commonly used in gear drives for power transmission is

a) a cycloid b) an involute c) an ellipse d) a parabola

117. Quick return mechanism is an inversion of

a) Four bar chain
b) Single slider crank chain
c) Double slider crank chain
d) Crossed slider crank chain

118. In reciprocating engines primary forces

a) are completely balanced
b) are partially balanced
c) are balanced by secondary forces
d) cannot be balanced

119. In a multiple V belt drive, when a single belt is damaged, it is preferable to change the complete set to

a) reduce vibration
b) reduce slip
c) ensure uniform loading
d) ensure proper alignment

120. The instantaneous centre of rotation of a rigid thin disc rolling on a plane rigid surface is located at

a) Centre of the disc
b) an infinite distance on the plane surface
c) the point of contact
d) the point on the circumference situated vertically opposite to the contact point

ROUGH WORK

SCHEME OF EXAMINATION FOR THE POST OF JUNIOR ENGINEER

Parts	Subject/Topic	No. of Questions	Marks
Part I	General / Mathematics	40	40
Part II	Core Engineering subjects Electrical, Mechanical, Civil, Computer Science.	80	80
	Total	120	120
** Minimum Qualifying Marks-40% ** However , selection will be based on the Merit Ranking.			

GENERAL INSTRUCTIONS:

1. Total duration of examination is 90 minutes (1 ½ Hours)
2. Each question carries one mark and maximum marks for the paper/written test is 120.
3. You will be provided
   (a) One booklet with two blank pages for rough work.
   (b) OMR sheet which is the answer sheet.
4. All questions are objective type only.
5. Please check whether you have marked your personal details such as Registration Number, etc., correctly both in question Booklet and Answer Sheet (OMR Sheet)
6. Select only one answer for a multiple-choice type question and **shade in the OMR sheet provided.**
7. Both the Question Booklet and the and the Answer/OMR Sheet must be handed over to the invigilator before leaving the examination hall.
8. Questions not answered will carry no mark. Wrong answers for multiple choice questions will result in **NEGATIVE** marks. For every wrong answer, **one –fourth marks will be deducted.**

Model Questions for the post of Junior Engineer

General Mathematics

1. which is the number that comes next in the following sequence 4,12,14,28,30, (....)
   a. 62 b. 32
   c. 60 d. 64

2) Two numbers are respectively 20% and 50% more than a third number. The ratio of the two numbers is:
   a. 4:5 b. 3:5
   c. 2:5 d. 6:7

3) 5463 + 546.3 – 54.63 / ? = 5999.3.
   a. 0.05463 b. 5.463
   c. 0.5463 d. None

4) A train 220 m long is running with a speed of 59 kmph. In what time will it pass a man who is running at 7 kmph in the direction opposite to that in which the train is going?
   a. 18 sec b. 15 sec
   c. 12 sec d. 20 sec

Engineering

5) An input of 3 V is fed to the non-inverting terminal of an operational amplifier. The amplifier has R_i of 10 kΩ and R_f of 10 kΩ . Find the output voltage.
   A. 2V B.4V
   C. 6V D.8V

6) The capacity of the material to absorb energy in the elastic range is known as
   a. Creep b. Fatigue
   c. Resilience d. Impact

7) The thickness of the chip is minimum at the beginning of cut and maximum at the end of the cut in case of
   a. Climb milling b. Up milling
   c. Down milling d. Face milling

8) Heat is absorbed by a refrigerant during a refrigeration cycle in a
   a. Condenser b. Evaporator
   c. Compressor d. Throttle valve

9) In what context is the slump test performed?
   a. Strength of concrete b. Workability of concrete
   c. Water- cement ratio d. Durability of concrete