104/2014

Maximum : 100 marks

Time : 1 hour and 15 minutes

1. The Poisson's ratio of a material is 0.4. If a force is applied to this material, there is a decrease in cross sectional area by 2%. The percentage increase in its length is :

   (A) 0.25% (B) 0.5%

   (C) 2.5% (D) 3%

2. The difference between LST and EST is called :

   (A) Activity (B) Event

   (C) Float (D) Critical path

3. Identify the method which is not a LPP technique :

   (A) Graphical method (B) Transportation problem

   (C) Simplex method (D) ABC analysis

4. Roving inspection is a kind of :

   (A) Key point inspection (B) Floor inspection

   (C) Fixed inspection (D) Final inspection

5. Which of the following is an inversion of double slider crank chain?

   (A) Whitworth quick return mechanism (B) Reciprocating compressor

   (C) Rotary engine (D) Scotch yoke mechanism

6. The size of an abrasive grain is termed as :

   (A) Grit (B) Grade

   (C) Structure (D) Orbit

7. The amount of money paid to a worker in cash for the effort put by him is called :

   (A) Real wage (B) Nominal wage

   (C) Living wage (D) Fair wage

8. In pig iron percentage of carbon varies from :

   (A) 0.1 to 0.5 (B) 0.5 to 1

   (C) 1 to 5 (D) 5 to 10

9. The production of flat vertical surfaces on both sides of a workpiece is called :

(A) Gang milling
(B) Straddle milling
(C) Form milling
(D) End milling

10. Which of the following is not a work holding device in a lathe?

(A) Mandrel
(B) Follower rest
(C) Face plate
(D) Tool post

11. A sensitive angle measuring device is :

(A) Clinometer
(B) Comparator
(C) Micrometer
(D) Interferometer

12. Convert the pressure head of 3m of oil having sp.gravity 0.8 into equivalent water head :

(A) 2.4 m of water
(B) 3.75 m of water
(C) 0.24 m of water
(D) 0.375 m of water

13. Double helical gears are also called :

(A) Hypoid gears
(B) Bevel gears
(C) Herring bone gears
(D) Spiral gears

14. Working of orifice meter is based on :

(A) Pascal's law
(B) Bernoulli's theorem
(C) Stoke's law
(D) Archimedes principle

15. A black body at 227°C radiates heat at the rate of 6 cal/cm^2 s. At a temperature of 727°C the rate of heat radiated in the same unit will be :

(A) 48
(B) 60
(C) 96
(D) 112

16. Babbit metal is an alloy of :

(A) Copper, tin and zinc
(B) Copper, tin and manganese
(C) Copper, tin and antimony
(D) Nickel, chromium and molybdenum

17. Least count of a micrometer is :

(A) 0.1 mm (B) 0.01 mm

(C) 0.001 mm (D) 0.0001 mm

18. Which of the following is not a non- destructive test?

(A) Radiographic test (B) Liquid penetrant test

(C) Ultrasonic test (D) Creep test

19. What is the intensity of pressure at a depth of 6m below the free surface of water?

(A) 58860 N/m^2 (B) 6000 N/m^2

(C) 58.86 N/m^2 (D) 6 N/m^2

20. In case of long column when both end fixed, the ratio between effective length (L) and actual length (l) is :

(A) $L = l$ (B) $L = 2l$

(C) $L = l/2$ (D) $L = l/\sqrt{2}$

21. In a PERT problem, optimistic time, most likely time & pessimistic time are 1, 2 & 3 respectively, then the expected time is :

(A) 1 (B) 2

(C) 3 (D) 4

22. For a circular pipe of diameter d ,the hydraulic mean depth m is equal to :

(A) 4d (B) 2d

(C) d/4 (D) d/2

23. Water is flowing with a velocity 4m/s² in a pipe line of diameter 8 cm. The diameter suddenly reduced to 2 cm, what is its corresponding velocity?

(A) $8 m/s^2$ (B) $16 m/s^2$

(C) $32 m/s^2$ (D) $64 m/s^2$

24. In gears, the ratio of pitch circle diameter in millimeters to the number of teeth is called :

(A) Pitch circle
(B) Circular pitch
(C) Diametral pitch
(D) Module

25. The unit of surface tension in SI unit is :

(A) Nm
(B) N/m
(C) N/m^2
(D) N^2/m

26. Pearlite is a combination of :

(A) Cementite and martensite
(B) Ferrite and iron graphite
(C) Ferrite and austenite
(D) Ferrite and cementite

27. The vertical passage through which molten metal poured into the mould is termed as :

(A) Sprue
(B) Swab
(C) Draw spike
(D) Gaggers

28. COP of a reversed carnot cycle is 5. Then ratio between higher temperature to lower temperature will be :

(A) 1.2
(B) 1.5
(C) 2
(D) 2.2

29. In adiabatic process :

(A) Enthalpy remains constant
(B) Entropy remains constant
(C) No work transfer takes place
(D) No heat transfer takes place

30. The ratio between direct stress and volumetric strain is :

(A) Bulk modulus
(B) Poisson's ratio
(C) Factor of safety
(D) Modulus of rigidity

31. A cantilever beam having uniformly distributed load on the entire length, then the maximum bending moment will be at the :

(A) Free end
(B) Middle
(C) Fixed end
(D) None of these

32. In an IC engine thermostat is an essential component in the :

(A) Cooling system
(B) Lubricating system
(C) Fuel system
(D) Ignition system

33. One stoke is equal to :

(A) $10^{-4} m^2/s$
(B) $10^{-3} m^2/s$
(C) $10^{-2} m^2/s$
(D) $10^{-1} m^2/s$

34. In which process heat rejection takes place in a carnot cycle?

(A) Isothermal expansion
(B) Isothermal compression
(C) Isentropic expansion
(D) Isentropic compression

35. The difference between dry bulb temperature and dew point temperature is :

(A) Dew point depression
(B) Dry bulb depression
(C) Wet bulb depression
(D) Degree of saturation

36. An undesirable property of a refrigerant is :

(A) High critical temperature
(B) High latent heat of vapourisation
(C) High boiling point
(D) Low specific heat of liquid

37. The maximum frictional force, when a body just begins to slide is called :

(A) Static friction
(B) Dynamic friction
(C) Kinematic friction
(D) Limiting friction

38. One litre of liquid weighs 8 N. Find its specific weight :

(A) $8 N/m^3$
(B) $80 N/m^3$
(C) $800 N/m^3$
(D) $8000 N/m^3$

39. When one of the links of a kinematic chain is fixed, then the chain is called :

(A) Inversion
(B) Mechanism
(C) Machine
(D) Structure

40. Kaplan turbine is :

(A) An axial flow reaction turbine
(B) An inward flow reaction turbine
(C) A mixed flow reaction turbine
(D) A tangential flow impulse turbine

41. Which of the following matrix does not have multiplicative inverse?

(A) $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ (B) $\begin{bmatrix} 3 & 2 \\ 2 & 3 \end{bmatrix}$

(C) $\begin{bmatrix} 2 & 3 \\ 4 & 6 \end{bmatrix}$ (D) $\begin{bmatrix} -1 & 0 \\ 3 & 1 \end{bmatrix}$

42. The value of $\sin(120^\circ)$ is :

(A) 1 (B) $\frac{\sqrt{3}}{2}$

(C) 0 (D) $\frac{1}{2}$

43. The slope of the straight line $2x - 3y + 1 = 0$ is :

(A) $\frac{2}{3}$ (B) $\frac{-2}{3}$

(C) $\frac{3}{2}$ (D) $\frac{-3}{2}$

44. Which of the following straight line is parallel to the line $3x + 4y + 1 = 0$?

(A) $3x + 4y - 1 = 0$ (B) $7x + y = 0$

(C) $4x + 3y + 1 = 0$ (D) $4x - 3y + 1 = 0$

45. The line $3x + 4y - 12 = 0$ cuts the X axis at :

(A) $(4, 3)$ (B) $(4, 0)$

(C) $(0, 3)$ (D) $(0, 4)$

46. The derivative of $\log(\sec x + \tan x)$ is :

(A) $\sec x - \tan x$ (B) $\tan x$

(C) $\sec x + \tan x$ (D) $\sec x$

47. Slope of the curve $y = \sin(2x)$ at $\left(\frac{\pi}{4}, 1\right)$ is :

(A) 1 (B) -1

(C) 0 (D) 2

48. If $\begin{vmatrix} 2 & 3 & 1 \\ x & 4 & 7 \\ 0 & 1 & 2 \end{vmatrix} = 0$, then the value of x is :

(A) $\frac{5}{2}$ (B) 3

(C) 5 (D) $\frac{2}{5}$

49. The coefficient of x^3 in the expansion of $\left(x+\frac{2}{x}\right)^7$ is :

(A) 49 (B) 84

(C) 40 (D) 26

50. If $\frac{dy}{dx} = 2x$, then y is :

(A) $x^2 + c$ (B) $x + c$

(C) $x^3 + c$ (D) $2x + c$

51. $\underset{x \to 2}{Lt}\left(\frac{x^2+7x-18}{x-2}\right)$ is :

(A) 11 (B) 0

(C) 7 (D) 2

52. The area of the region bounded by the line $x - y = 0$, x axis, $x = 0$ and $x = 2$ is :

(A) 4 sq. units (B) 2 sq. units

(C) 12 sq. units (D) 6 sq. units

53. The function $y = x^2 + 6x + 1$ is decreasing at :

(A) $(1, 8)$ (B) $(-1, -4)$

(C) $(0, 1)$ (D) $(-4, -7)$

54. $\int_0^{\frac{\pi}{2}} \sin\left(\frac{\theta}{2}\right) d\theta$ is :

(A) $\sqrt{2}$ (B) 2

(C) $2 - \sqrt{2}$ (D) $2 + \sqrt{2}$

55. $\underset{x\to\infty}{Lt}\dfrac{x^2+3x}{x+3x^2}$ is:

(A) 3 (B) 1

(C) 0 (D) $\dfrac{1}{3}$

56. The number of terms in the expansion of $(x+2)^{33}$ ——— $(x-2)^{33}$ after simplification is :

(A) 32 (B) 0

(C) 17 (D) 33

57. If $Cos\,(x) = Sin\,(x+40^\circ)$, then the value of x is :

(A) 10° (B) 5°

(C) 25° (D) 1°

58. If $x = t^2 - 1$ and $y = 2e^t$, then $\dfrac{dy}{dx} =$:

(A) $\dfrac{2e^t}{t}$ (B) e^t

(C) $\dfrac{e^t}{t^2}$ (D) $\dfrac{e^t}{t}$

59. The normal to the curve $y = x^3$ at $(1, 1)$ is :

(A) $x+y=0$ (B) $x+3y-4=0$

(C) $y-x=0$ (D) $x=0$

60. If $A = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ then $A^2 =$:

(A) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ (B) $\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$

(C) $\begin{bmatrix} 1 & 1 \\ 0 & 0 \end{bmatrix}$ (D) $\begin{bmatrix} 0 & 0 \\ 1 & 1 \end{bmatrix}$

61. What does the prefix 'femto' stands for?
(A) 10^{-6} (B) 10^{-9}
(C) 10^{-12} (D) 10^{-15}

62. What is the mass of 30 m^3 of water?
(A) 30,000 kg (B) 300 kg
(C) 3,000 kg (D) 30 kg

63. When a road is banked at a curve the angle of banking is determined the relation?
(A) $\tan\theta = \frac{v^2}{rg}$ (B) $\sin\theta = \frac{v^2}{rg}$
(C) $\cos\theta = \frac{v^2}{rg}$ (D) $\theta = \frac{v^2}{rg}$

64. What should be the power of a motor capable of pumping 1000 kg of water to a height 10 m from ground in 10 seconds?
(A) 98 watts (B) 9800 watts
(C) 980 watts (D) 9.8 watts

65. What is the resultant of two forces of which one force is 20 Newtons acting towards east and the other forces is 50 Newtons acting towards west?
(A) 25 Newton towards west (B) 25 Newton towards east
(C) 30 Newton towards west (D) 70 Newton towards east

66. How is the viscosity of a fluid varies when the temperature is raised?
(A) Increases (B) Decreases
(C) Does not change (D) Fluctuates

67. What is the pressure equivalent to a water column of height 1 meter?
(A) 9800 N/m^2 (B) 800 N/m^2
(C) 1000 N/m^2 (D) 1800 N/m^2

68. Which type of waves are used in 'SONAR'?
(A) X- rays (B) Light waves
(C) Alpha rays (D) Ultrasonic waves

69. A sprayer make use of :
(A) Bernoulli's principle (B) Newtons Law
(C) Pascal's Law (D) Friction

70. It is easier to roll a heavy cylinder over a surface because :
(A) Kinetic friction is less than rolling friction
(B) Rolling friction is much less than kinetic friction
(C) Absence of static friction
(D) Absence of kinetic friction

71. Galvanisation of iron denotes Coating with :

(A) Al (B) Pb
(C) Sn (D) Zn

72. The particles of light are called :

(A) Photons (B) Protons
(C) Electrons (D) Neutrons

73. The oxidation state of Manganese in K_2MnO_4 is :

(A) +7 (B) +6
(C) +2 (D) −2

74. The monomer of natural rubber is :

(A) Styrene (B) 3- methyl-1, 3-butadiene
(C) 2-methyl-1, 3-butadiene (D) Teflon

75. The Compound used as antiknock is :

(A) Ethanol (B) Propanol
(C) Glyoxal (D) Tetraethyllead

76. Ozone is present in :

(A) Thermosphere (B) Stratosphere
(C) Troposphere (D) Mesosphere

77. Calculate the molarity of a solution containing 5.3g of Na_2CO_3 in 100mL of water :

(A) 0.5 M (B) 0.2 M
(C) 0.1 M (D) 0.05 M

78. Temporary hardness in water is caused by :

(A) Calcium carbonate (B) Calcium sulphate
(C) Magnesium carbonate (D) Magnesium bicarbonate

79. Calculate the number of moles in 22g of CO_2 :

(A) 0.5 mol (B) 0.7 mol
(C) 0.8 mol (D) 0.75 mol

80. Which of the following is an unique property of carbon?

(A) Ionization (B) Dissolution
(C) Catenation (D) Sublimation

81. Who wrote the book Darsanamala?
(A) Chattampi Swamikal (B) Sree Narayan Guru
(C) Vallathol Narayana Menon (D) Kumaranasan

82. Indian National Congress was founded in the year :
(A) 1884 (B) 1885
(C) 1886 (D) 1887

83. 'Magic Johnson' is associated with :
(A) Boxing (B) Cricket
(C) Hockey (D) Basket ball

84. Name the patriot who started the newspaper "Swadeshabhimani" in 1905:
(A) Ramakrishnapillai (B) Vakkom Abdul Khader Moulavi
(C) Dr. Palpu (D) K. P. Kesava Menon

85. Gandhiji started his Sathyagraha movement in India at :
(A) Kheda (B) Berdoli
(C) Lahore (D) Chambaran

86. Name the East flowing river in Kerala :
(A) Periyar (B) Pambar
(C) Pamba (D) Chandragiripuzha

87. The Tashkent Agreement was signed between :
(A) India and Pakistan (B) India and Srilanka
(C) India and Russia (D) India, Russia and Pakistan

88. Galileo Galilie was an ——— scientist.
(A) German (B) Spanish
(C) Italian (D) Australian

89. Bhakranangal Dam has been built on the river :
(A) Ganga (B) Narmada
(C) Satlaj (D) Mahanadi

90. Who founded Sadbujana Paripalana Yogorm?
(A) Mannathu Padmanabhan (B) Vaghbhatananda
(C) Ayyankali (D) Kumara Guru

91. Whose birthday is being celebrated as "Sadbhavana day"?
(A) Mahatma Gandhi (B) Rajiv Gandhi
(C) Indira Gandhi (D) Jawaharlal Nehru

92. The currency of Bangladesh is :
(A) Rupee (B) Taka
(C) Yen (D) Dollar

93. "The Permanent Settlement Act" was introduced by :
(A) Lord Dalhousie (B) Lord Cornwallis
(C) Lord Rippon (D) Lord Lytton

94. Basava Punnaia the famous communist leader who led the movement in :
(A) Tebhaga (B) Telugana
(C) Calcutta (D) Tripura

95. 'Back to vedas' was a slogan by :
(A) Rajaram Mohan Roy (B) Ramakrishna Paramahamsar
(C) Dayananda Saraswathy (D) Swami Vivekananda

96. The headquarters of International Monetary Fund is in :
(A) Washington (B) Geneva
(C) New York (D) Paris

97. Ustad Bismillakhan is associated with :
(A) Flute (B) Violin
(C) Shehnai (D) Veena

98. The mountain ranges which divided the North and South India :
(A) Himalayas (B) Vindhyas
(C) Western Ghats (D) Eastern Ghats

99. Rigveda contains :
(A) 1028 hymns (B) 1050 hymns
(C) 1038 hymns (D) 1018 hymns

100. Present chief justice of Kerala :
(A) Justice P. Sadasivam (B) Justice K.T. Thomas
(C) Justice Manjula Chelloor (D) Justice Althamas Kabeer