Maximum : 100 marks

Time : 1 hour and 15 minutes

1. The Wagon Tragedy, the tragic incident of Malabar Rebellion took place on :
   (A) 11 Nov 1921
   (B) 22 Nov 1921
   (C) 10 Nov 1921
   (D) 25 Nov 1921

2. The Hortus Malabaricus, the encyclopaedia of plants of Kerala was prepared by :
   (A) The Portuguese
   (B) The Spanish
   (C) The Dutch
   (D) The British

3. Name the Spanish Missionary, who initiated the first printing in Malayalam at Goa :
   (A) Jovannes Gonsalvez
   (B) Francis Xavier
   (C) Melchior Carneiro
   (D) Alexander Valignano

4. Who filed a suit at the court against the higher caste men and asked the court to issue orders permitting the Channar women to wear jackets?
   (A) Lord Canning
   (B) Charles Wood
   (C) Lord Salisbury
   (D) Reed

5. Who started the CMS Press in 1821?
   (A) Johannes Gutenberg
   (B) Benjamin Baily
   (C) Herman Gundert
   (D) Vargis Mappilai

6. Which article of the Indian Constitution deals with the National Emergency?
   (A) Art 32
   (B) Art 368
   (C) Art 352
   (D) Art 356

7. Which of the following organizations later transformed into Pulayar Maha Sabha in 1938?
   (A) SJPS
   (B) PRDS
   (C) KSS
   (D) TCMS

8. Who wrote the Central Academi Award Winning Novel "Ayalkkar" in 1963?
   (A) Uroob
   (B) P. Kesava Dev
   (C) M.T. Vasudevan Nair
   (D) Vaikom Muhammad Basheer

9. Which of these commissions was related to Centre-State relations?

(A) Liberhan (B) Kothari

(C) Sarkaria (D) Nanavati

10. MCOCA is enacted by :

(A) Uttar Pradesh (B) Delhi

(C) Maharashtra (D) Jammu and Kashmir

11. $A=\begin{bmatrix}1 & 2\\ 3 & 4\end{bmatrix}$ then value of $adj\ A$ will be :

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

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

12. Value of determinant $\begin{bmatrix}1 & 3\\ 1 & 3\end{bmatrix}$ will be :

(A) -8 (B) 0

(C) 8 (D) 4

13. Third term in the expansion of $(x+y)^4$ will be :

(A) y^4 (B) $4x^3y$

(C) $6x^2y^2$ (D) $4xy^3$

14. If $\tan x=1$ then value of $\cos x$ will be :

(A) 1 (B) -1

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

15. Value of $\sin\frac{\pi}{2}\cos 0\tan\frac{\pi}{4}$ will be :

(A) -1 (B) 1

(C) 0 (D) $\sqrt{2}$

16. What will be the angle between the straight lines $y=\sqrt{3x}-5=0$ and $\sqrt{3y}-x+6=0$?

(A) 30° (B) 60°

(C) 45° (D) 90°

17. What will be the derivative of $\log(\tan x)$ with respect to x?

(A) $\tan x$ (B) $\cot x$

(C) $\frac{1}{\tan x}$ (D) $\sec x \operatorname{cosec} x$

18. What will be the value of $\frac{\tan x}{x}$ as $x \to 0$?

(A) 0 (B) infinity

(C) 1 (D) -1

19. $\int \sin x \, dx$ will be equal to :

(A) $-\cos x + c$ (B) $\cos x$

(C) $\cos x + c$ (D) $\sin x + c$

20. What will be the area bounded by the curve $y = x^2 + x$ and the X-axis?

(A) $\frac{1}{3}$ (B) 0

(C) $\frac{x^3}{3} + \frac{x^2}{2}$ (D) $\frac{1}{6}$

21. Rocks formed as a result of the alteration of original structure due to heat and excessive pressure are called :

(A) sedimentary rocks (B) igneous rocks

(C) metamorphic rocks (D) stratified rocks

22. The bond in which each course consists of alternate layers of stretchers and headers are called :

(A) English bond (B) Flemish bond

(C) Raking bond (D) Single Flemish bond

23. The distance between two points measured by a 20 cm chain was recorded as 520 m, when the chain is 5 cm too long. The true distance is :

(A) 518.7 m (B) 521. 3 m

(C) 520 m (D) 494 m

24. The bench mark established by the survey of India department is :

(A) Permanent BM (B) Temporary BM

(C) Arbitrary BM (D) Great trigonmetrical BM

25. In a levelling work the sum of back sights and foresights are 70.265 m and 71.050 m. If the first reduced level as bench mark is 105.005 m, the last reduced level is :

(A) 104.220 m
(B) 105.790 m
(C) 105.005 m
(D) 105 m

26. In a petrol engine, the air petrol ratio is controlled by :

(A) Distributer
(B) Carburettor
(C) Fuel injector
(D) Crank shaft

27. The clutch in an automobile is fitted between :

(A) Engine and wheel
(B) Gear box and propeller
(C) Engine and gear box
(D) Gear box and differential

28. A starting motor directly drives the :

(A) Crank shaft
(B) Differential
(C) Cam shaft
(D) Fly wheel

29. Which of the following is a water tube boiler?

(A) Lamont boiler
(B) Nestler boiler
(C) Lanchashire boiler
(D) Cochran boiler

30. Pelton turbine is suitable for :

(A) Low head high discharge
(B) High head low discharge
(C) Low head low discharge
(D) Medium head medium discharge

31. Four identical resistors are first connected in parallel and then in series. The resultant resistance of the first combination to the second will be :

(A) 1/16 times
(B) $\frac{1}{4}$ times
(C) 4 times
(D) 16 times

32. Which of the following statements is not necessarily valid for ac currents Alternating currents?

(A) interferes with communication lines
(B) is suitable for charging batteries
(C) develops eddy current losses
(D) provides better safety as compared to direct current

33. An inductor :

(A) allows ac to pass but blocks dc
(B) allows dc to pass but blocks ac
(C) allows both ac and dc to pass
(D) blocks dc

34. The operating cost of ten 100 W lamps at their rated voltage for 20 hours at the rate of Rs. 2.50 per unit is :

(A) Rs. 5.00
(B) Rs. 20.00
(C) Rs. 40.00
(D) Rs. 50.00

35. The cheapest system of internal wiring is :

(A) Cleat wiring
(B) Casing tapping wiring
(C) CTS or TRS wiring
(D) Conduit wiring

36. A dc to ac converter is called :

(A) Dual converter
(B) Inverter
(C) Chopper
(D) Cyclo-converter

37. If the PIV across each diode of a bridge rectifier is 28.3 V calculate its average dc value :

(A) 14.1 V
(B) 34 V
(C) 28.3 V
(D) 18.01 V

38. Select the incorrect statement about CDMA :

(A) All users occupy the same bandwidth
(B) It is used by GSM
(C) It utilize spread spectrum technique
(D) All users assigned separate codes

39. Which of the material is used to make an infrared emitting LED?

(A) GaP
(B) GaAsp
(C) GaAs
(D) None of these

40. If the crystal frequency of 8051 is 16 megahertz, then time taken to execute an one cycle instruction is :

(A) 0.75 μS
(B) 62.5 ms
(C) 12.5 μS
(D) 15.5 nS

41. Which "M" is not connected with management process?

(A) Man
(B) Machine
(C) Modernisation
(D) Materials

42. Name the father of management :

(A) Henry Fayol
(B) Robert Owen
(C) F.W. Taylor
(D) H.C. Gantt

43. The uniform expense provided by the company is under :

(A) Real wage
(B) Living wage
(C) Nominal wage
(D) None

44. What are the key components of a total quality management system?

(A) Collective responsibility, continuous improvement, use of raw data
(B) Involves everyone, continuous improvement, use of data, and knowledge
(C) Individual responsibility, incremental improvement, use of raw data
(D) Group responsibility, staged improvement, knowledge

45. The time in which the activity is normally expected to complete under normal conditions is known as :

(A) Optimistic time
(B) Most likely time
(C) Pessimistic time
(D) Normal time

46. A firm manufactures 3 types of clothes namely A, B, and C. Red, Green and Blue colour wool are required for it, For one unit length of type A cloth required 2 m red wool, 3 m blue wool. Type B cloth need 3 m red, 2 m green and 4 m blue. Type C clothes need 5 m green and 4 m blue. The firm has stock of 8 m of red wool, 10 m of green wool and 15 m blue wool. If the income from one unit length of type A is Rs. 3, B is Rs. 5 and C is Rs. 4, which formulation is not correct?

(A) $2x_1 + 3x_2 \leq 8$
(B) $3x_1 + 4x_2 + 4x_3 \leq 15$
(C) $2x_2 + 5x_3 \leq 10$
(D) $3x_1 + 2x_2 + 4x_3 \leq 15$

47. EOQ is the size of order which minimizes :

(A) ordering cost
(B) procuring cost
(C) total cost
(D) inventory carrying cost

48. What is the correct sequence of operations in production planning and control?

(A) Routing-scheduling-Dispatching-Follow up
(B) Scheduling-Routing-Dispatching-Follow up
(C) Dispatching-Routing-Scheduling-Follow up
(D) Routing-scheduling-Follow up-Dispatching

49. A bag is being weighed as it is filled with flour is an example of :

(A) transportation cum inspection
(B) operation cum transportation
(C) operation cum inspection
(D) none of the above

50. The control chart used for the number of defects per unit is :

(A) Range chart
(B) Mean chart
(C) p-chart
(D) c-chart

51. The therblig symbol used for micro motion of 'release' is :

(A) RL
(B) R
(C) RE
(D) RS

52. Under the straight line method of providing depreciation it :

(A) increase every year
(B) remain constant every year
(C) decreases every year
(D) none of the above

53. Which element is having a Face centered cubic structure?

(A) Zinc
(B) Silver
(C) Sodium
(D) Lithium

54. Heating the job above it's critical temperature and cool it inside the furnace itself is :

(A) Tempering
(B) Normalising
(C) Annealing
(D) Hardening

55. Izod test is used to find out :

(A) Impact
(B) Fatigue
(C) Hardness
(D) Tensile

56. A vernier caliper with it's main scale division 0.5 mm and vernier scale length 12 mm is divided equally with 25 divisions, has a least count of :

(A) 0.02 mm
(B) 0.01 mm
(C) 0.46 mm
(D) 0.04 mm

57. Which one is not a shielding gas in MIG welding?

(A) Argon
(B) Helium
(C) Hydrogen
(D) Carbon dioxide

58. Metal inserts placed in the mould to induce directional solidification is known as :

(A) sprue pin
(B) core
(C) chaplets
(D) chill

59. The hand tool which used to make oil pockets in mating surface is :

(A) chisel
(B) scraper
(C) punch
(D) scriber

60. Which cutting condition is helpful for producing continuous chip?

(A) low cutting speed
(B) small rake angle tool
(C) high depth of cut
(D) using cutting fluid

61. What is the best method for producing short external tapers with various angles?

(A) compound rest method
(B) form tool method
(C) set over method
(D) taper turning attachment method

62. Which indexing method is best suit for producing 16 numbers of teeth for a gear?

(A) differential indexing
(B) direct indexing
(C) simple indexing
(D) compound indexing

63. Among the listed bond which one is the strongest?

(A) vitrified
(B) silicate
(C) shellac
(D) resinoid

64. Up and down movement of wrist of a robot in β axis in named as :

(A) yaw
(B) pitch
(C) roll
(D) jog

65. Newton's law of viscosity refers to :

(A) pressure and velocity of a fluid
(B) stress and strain of a fluid
(C) yield stress and rate of angular deformation
(D) shear stress and rate of angular deformation in a fluid

66. An open tank contains 50 cm of water covered with 30 cm of oil with specific gravity 0.8. What is the pressure in the bottom of the tank?

(A) 240 kgf/m^2
(B) 740 kgf/m^2
(C) 500 kgf/m^2
(D) 250 kgf/m^2

67. The continuity equation stands for conservation of :

(A) momentum
(B) energy
(C) vorticity
(D) mass

68. The head loss for unit length of a circular pipe is dependent :

(A) directly on square of flow velocity

(B) directly on flow velocity

(C) inversely on square of diameter

(D) directly on pipe diameter

69. Which pump is a rotary positive displacement with axial displacement?

(A) vane pump

(B) gear pump

(C) lobe pump

(D) screw pump

70. FRL unit consists of :

(A) Flow, Relief, Lubricate

(B) Filter, Relief valve, Lubricator

(C) Filter, Regulator, Lubricator

(D) Flow control valve, Relief valve, Lob pump

71. A water jet with nozzle area of 0.0015 m^2 impinges perpendicular on a moving plate with a velocity of 15 m/s. If the velocity of the plate is 5 m/s, what is the impact force?

(A) 340 N

(B) 1470 N

(C) 900 N

(D) 150 N

72. A Pelton wheel is best suited for :

(A) low discharge and high head

(B) high discharge and low head

(C) low discharge and low head

(D) high discharge and high head

73. A surge tank is provided for protecting the :

(A) Spiral casing

(B) Draft tube

(C) Penstock

(D) Turbine runner

74. Specific speed of a turbine :

(A) $\frac{N\sqrt{P}}{H^{4/5}}$

(B) $\frac{N\sqrt{H}}{P^{5/4}}$

(C) $\frac{N\sqrt{P}}{H^{5/4}}$

(D) $\frac{P\sqrt{N}}{H^{4/5}}$

75. The reason for consuming much of power by a centrifugal pump may be :

(A) air leakage

(B) the pump being run at low speed

(C) foot valve is not effective

(D) heavy liquid may be pumped

76. The work saved by fitting an air vessel in a reciprocating pump is :

(A) 39.2% (B) 84.8%

(C) 48.8% (D) 28.9%

77. Which one is not an elastic constant?

(A) Yield point (B) Young's modulus

(C) Modulus of rigidity (D) Bulk modulus

78. The force of friction acts in a direction ———— to the direction of motion of object.

(A) Same (B) Downwards

(C) Perpendicular (D) Opposite

79. The centroid of a body :

(A) must be a point on that body

(B) is a point which can be made to lie on or outside the body by changing the coordinate system

(C) is fixed point in space regardless of the orientation of the body

(D) is a unique point fixed with respect to the body

80. Thermal strains in a composite body will be :

(A) Twice of each other (B) Equal

(C) One half of the other (D) Two third

81. When a lap joint is subjected to tensile load the stress induced in the rivet is :

(A) shear stress (B) compressive stress

(C) tensile stress (D) bending stress

82. The maximum bending moment in a cantilever of span l carrying s uniformly distributed load of intensity w per unit length is :

(A) $\frac{wl^2}{3}$ (B) $\frac{wl^2}{2}$

(C) wl^2 (D) wl

83. How much power can be transmitted by a 60 mm solid shaft at a speed of 100 rpm with a material of permissible shear stress 50 MPa?

(A) 60 kW (B) 212.2 kW

(C) 22.2 kW (D) 30.5 kW

84. Which one is not the function of coefficient of friction in a bearing?

(A) $\frac{l}{c}$ (B) $\frac{ZN}{P}$

(C) $\frac{d}{c}$ (D) $\frac{l}{d}$

85. The circle drawn with its centre as the cam centre, to pass through the pitch point is the :

(A) prime circle (B) pitch circle

(C) base circle (D) cam circle

86. Coefficient of fluctuation of speed of flywheel is :

(A) $\frac{\omega_1 - \omega_2}{\omega_1}$ (B) $\frac{\omega_1 - \omega_2}{\omega_2}$

(C) $\frac{\omega_1 - \omega_2}{\omega}$ (D) $\frac{\omega}{\omega_1 - \omega_2}$

87. For the same centre distance the length of open belt is ———— cross belt.

(A) greater than (B) same as

(C) more or less than (D) less than

88. Automobile sliding gear box gear train is :

(A) reverted gear train (B) simple gear train

(C) compound gear train (D) epicyclical gear train

89. A thermodynamic cycle having two constant volume and two adiabatic processes is :

(A) Diesel cycle (B) Carnot cycle

(C) Otto cycle (D) Joule cycle

90. One kg of carbon requires 4/3 of oxygen and produces ———— kg of carbon dioxide.

(A) 8/3 (B) 1/3

(C) 4/3 (D) 7/3

91. Which efficiency is not related to power?

(A) indicated thermal efficiency (B) break thermal efficiency

(C) mechanical efficiency (D) air standard efficiency

92. Fourier's law for :

(A) radiation (B) conduction

(C) convection (D) emission

93. Which assumption is wrong for LMTD?

(A) Overall heat transfer coefficient should vary throughout the heat exchanger

(B) The heat exchange takes place only between the two fluids

(C) Temperature of both fluids are constant over a given cross section

(D) The specific heat at constant pressure remains constant throughout the heat exchanger

94. The volume of air delivered by the compressor is known as :

(A) swept volume (B) free air delivery

(C) compressor capacity (D) exhaust air

95. Which one is not consider as a rotary compressor?

(A) axial flow compressor (B) piston compressor

(C) roots blower (D) vane blower

96. Tonne of refrigeration is :

(A) 620 kJ/min (B) 420 kJ/min

(C) 1000 kJ/min (D) 210 kJ/min

97. Heat rejection is carried out in a vapour compression cycle is in :

(A) expansion valve (B) compressor

(C) condenser (D) evaporator

98. The uniformly spaced vertical lines on psychrometric chart indicates :

(A) specific humidity (B) specific volume

(C) wet bulb temperature (D) dry bulb temperature

99. Which classification is not based on season of the year?

(A) comfort air conditioning (B) winter air conditioning

(C) summer air conditioning (D) year round air conditioning

100. Which is not a factor for comfort air conditioning?

(A) temperature (B) light

(C) air movement (D) humidity