179/2024

Maximum : 100 marks

Time : 1 hour and 30 minutes

1. Parallelism of bars and rods can be measured using :

(A) Vernier Caliper (B) Dial Gauge

(C) Sine Bar (D) None of these

2. Mechanical Advantage of a lever can be obtained as :

(A) Effort / Load (B) Work/Distance

(C) Load/Effort (D) Distance/Work

3. A non-consumable electrode is used in :

(A) MIG welding (B) Arc Welding

(C) Gas welding (D) TIG welding

4. Identify the correct statements from the following:

1. In brazing base metal is not being melted
2. In welding base metal is heated below melting point

(A) Both 1 and 2 are correct (B) Only 1 is correct

(C) Only 2 is correct (D) Both 1 and 2 are wrong

5. Which one is not a function of counter weight in an elevator?

(A) Balancing the weight of the elevator

(B) Reduce the load on the motor

(C) Make the system stable

(D) Reduce the friction in movement

6. The safety mechanism used in elevators to prevent damage and injury in the event of an elevator car free fall :

(A) Shock absorber (B) Counter weight

(C) Buffer (D) Safety alarm

7. A derrick without a boom and with single tower is known as :

(A) Guy (B) Gin Pole

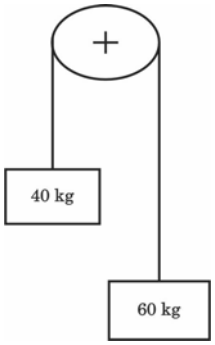
(C) Chicago boon (D) Break

8. Select the temporary fastener from the following :

(A) Nut and Bolt (B) Rivet

(C) Welded joint (D) None of these

9.



Calculate the tension in the string as well as the acceleration of masses if there is negligible friction between pulley and string.

(A) 400 N, 5 m/s^2 (B) 480 N, 2 m/s^2

(C) 480 N, 5 m/s^2 (D) 400 N, 2 m/s^2

10. Distance moved by a threaded fastener in one revolution is called :

(A) Pitch (B) Lead

(C) Helix (D) Displacement

11. Apparent weight of a person having mass 'm' in a lift moving downward with acceleration 'a' can be expressed as. ..(g = acceleration due to gravity).

(A) m (g + a) (B) g (m + a)

(C) m(g – a) (D) a(m + g)

12. Select the correct statement from the following :

1. The operator shall be familiar with the crane or Hoist operating characteristics and be aware of the safety rules for the operator.
2. No crane, hoist or rigging hardware shall be loaded beyond the rated capacity, except for test purposes.

(A) Both 1 and 2 are correct (B) Only 1 is correct

(C) Only 2 is correct (D) Both 1 and 2 are wrong

13. Identify the standard elevator component from the following :

(A) Car (B) Hoist way

(C) Machine/Drive system (D) All the above

14. Which safety feature stops elevator doors from closing if an obstacle is detected?

(A) Limit switch (B) Photocell sensor

(C) Door Clutch (D) Magnetic Lock

15. What standard must safety goggles meet to ensure they provide adequate protection?

(A) ISO 9001 (B) ANSI Z87.1

(C) FDA Approval (D) CE Class I

16. Viscosity of petroleum oil for hydraulic lift is ————————.

(A) High (B) Low

(C) Moderate (D) Very high

17. What is the purpose of the machine beam in a lift system?

(A) To control lift's movement (B) To support elevator equipment

(C) To guide the lift's path (D) To provide lighting in the lift

18. The process of lubrication in elevator comes under which type of maintenance

(A) Breakdown maintenance (B) Routine maintenance

(C) Predictive maintenance (D) Both (A) and (B)

19. ———————— is the distance between the car buffer striker plane and the striking surface of the car buffer.

(A) Pit maintenance work clearance (B) Bottom car run by

(C) Bottom counter weight run by (D) Bottom car clearance

20. Which operation is affected by power failure on elevator?

(A) Brake operations (B) OSG operation

(C) Motor operations (D) Buffer operations

21. From the following list which rotating elements is used to transmit power from one part to another part of machine?

(A) Fan (B) Pulley

(C) Shaft (D) Bearing

22. The device used to correct elevator car level on both under run and over run is

(A) Levelling device (B) Limit switch

(C) Breaking devices (D) Land call button

23. Which device is used to prevent reversal of direction of escalator?

(A) Motor drive (B) Controller

(C) Speed governor (D) Braking system

24. Which one from the following is the purpose of pit switch?

(A) Change speed (B) Stop lift

(C) Change direction (D) Run lift

25. Choose the safety component used in electrical traction elevator.

(A) Progressive gear (B) Counter weight

(C) Guide rail (D) Deflector sheave

26. Name the type of gear used to transmit power from one rotating shaft to another whose axes are neither parallel not intersecting.

(1) Spur gear

(2) Spiral gear

(3) Worm gear

(4) Crown gear

(A) (1) only (B) Both (1) and (2)

(C) (3) only (D) Both (2) and (4)

27. 'Both of the hoist way doors operates on same side one after other'- Identify the type?

(A) Collapsible gate (B) Telescopic door

(C) Automatic door (D) Swing door

28. Which is the name of scaffold parts and items?

(A) Adjustable reveal pin coupler (B) Putlog end

(C) Shoring jack (D) Base plate

29. Which switch operates before the car come into contact with the buffers?

(A) Final limit switch (B) ARD

(C) OSG (D) Pit switch

30. The safety device to stop descending car and counter weight beyond normal limit in car is known as

(A) Over Speed Governor (B) Limit switch

(C) Buffers (D) Safety gear

31. How to inspect the engagement between the combs and the steps of escalator?

(A) Move escalator up

(B) Move escalator down

(C) Stable condition

(D) Move escalator up and down by inch button

32. How to eliminate hazard to trip an over speed governor located in a hoist way?

(A) Manual tripping (B) Remote tripping

(C) Switch off supply (D) Operate lift in opposite direction

33. SWL Means :

(A) Standard working load
(B) Stable working load
(C) Safe working load
(D) Side working load

34. Which is known as corrective maintenance?

(A) Predictive maintenance
(B) Breakdown maintenance
(C) Preventive maintenance
(D) Scheduled maintenance

35. What is the function of emergency lights provided in lift car?

(A) To make call outside
(B) To indicate the control switches
(C) To make the way to exit
(D) To call the rescue team

36. The arrangement of Escalators that minimizes the structural space requirements by "stacking" escalators that go in one direction is :

(A) Parallel
(B) Multiple parallel
(C) Crisscross
(D) None of these

37. The device which automatically actuates safety devices in the even of equipment over-speed is :

(A) Driving machinery
(B) Governor
(C) Electromechanical brake
(D) Caution Plate

38. The semi-circle-shaped end of a balustrade at the upper and lower landing housing the switches for on/off, emergency etc. is :

(A) Newel
(B) Skirt Panel
(C) Step chain
(D) Escalator controller

39. Which component is used to detect people entering or leaving the car?

(A) Magnetic
(B) Infrared
(C) PVT
(D) Weight sensor

40. What is the steps clearance through step run in guide of escalator?

(A) 1 mm
(B) 3 mm
(C) 4 mm
(D) 9 mm

41. The device used to prevent the reversal of the direction of the escalator is:

(A) Braking system
(B) Controller
(C) Speed governor
(D) Motor drive

42. Identify the input control system component is the elevator :

(A) Sensors
(B) Actuators
(C) Bells
(D) Displays

43. The enclosure at either side of the moving steps, the decking or deckboard outside the moving handrails is known as :

(A) Comb
(B) Balustrading
(C) Deckboard
(D) Newel

44. Which of the following is a common material for bearing bushes?

(A) Copper
(B) Inconel
(C) Gun Metal
(D) Aluminium

45. Which among the following forms a part of an assembly that supports another part in the assembly?

(A) Shearing
(B) Bearing
(C) Governing
(D) Stradling

46. Which of the following is not true about worm gears?

(A) Silent and smooth operation
(B) Compact
(C) Low speed reduction
(D) All the mentioned are true

47. The tangential force on worm for a certain lifting operation is 1,500 N, then axial force on worm wheel will be :

(A) 750 N
(B) 1,500 N
(C) 3,000 N
(D) $1500\sqrt{2}$ N

48. Statement 1 : Worm gears are used in mechanisms for lifting operations.

Statement 2 : Worm gears are advantageous to use in lifting operations as they support self-locking operation.

(A) Statement 1 is correct and statement 2 is incorrect
(B) Statement 1 is incorrect and statement 2 is correct
(C) Both statements are correct and statement 2 is correct explanation to statement 1
(D) Both statements are correct and statement 2 is not the correct explanation to statement 1

49. The correct expansion of OSG in lift operation is :

(A) Over Speed Grip
(B) Over Speed Gear
(C) Over Speed Guide
(D) Over Speed Governor

50. Which of the switch Functions before the lift - car come into contact with the buffers?

(A) Pit Switch
(B) Final limit switch
(C) OSG
(D) ARD

51. What is the form factor for sinusoidal AC?

(A) 1 (B) 1.11

(C) 2.22 (D) 4.44

52. What is the reciprocal of reactance in an AC parallel circuit?

(A) Impedance (B) Admittance

(C) Conductance (D) Susceptance

53. What is the power factor in a 3 phase power measurement of two wattmeters showing equal readings?

(A) 0 (B) 0.8

(C) 0.5 (D) 1

54. How much electrical energy is consumed in an electric iron rated as 750W/250V used for 90 Minutes?

(A) 0.75 kWh (B) 1.25 kWh

(C) 1.125 kWh (D) 1.5 kWh

55. Which of the following materials has highest electrical conductivity?

(A) Steel (B) Aluminium

(C) Copper (D) Silver

56. The capacitor are used across AC supply for

(A) Power Improvement (B) Power factor improvement

(C) Current improvement (D) Voltage improvement

57. In an Inductive AC circuit, current

(A) Lags behind the voltage by 180^{o} (B) Leads the voltage by 90^{o}

(C) Lags behind the Voltage by 90° (D) Is in phase with the Voltage

58. The Capacitive Reactance

(A) Decreases as frequency increases

(B) Applies only to series RLC circuits

(C) Increases as frequency increases

(D) Increases with the time constant

59. What is the phase displacement in a 3-phase AC circuit ?

(A) 90^{o} (B) 270^{o}

(C) 180^{o} (D) 120^{o}

60. The unit of impedance is

(A) Ohms (B) Siemens

(C) Mho (D) Henry

61. ———— is the measure of how much potential difference the insulation layer can withstand without breaking down.

(A) Insulation resistance (B) Breakdown voltage

(C) RMS voltage (D) Dielectric strength

62. Which cell is most often used in digital watches?

(A) Voltaic (B) Mercury

(C) Lithium (D) Silver oxide

63. What is the term for the time taken by a fuse to interrupt the circuit in fault?

(A) Time factor (B) Fusing factor

(C) Fusing current (D) Cutt-off factor

64. What is the purpose of ELCB?

(A) Detects the fault in circuit

(B) Monitors the residual current

(C) Protects the equipment from over load

(D) Protects from short circuit

65. Oxygen is an example of :

(A) Para magnetic substance (B) Diamagnetic substance

(C) Ferromagnetic substance (D) Anti ferromagnetic substance

66. What is the tool used to bend conduits?

(A) Coupler (B) Hickey

(C) Pipe vice (D) Bench vice

67. What rule is applied to find the direction of magnetic fields in a solenoid coil?

(A) Cork screw rule (B) Right hand palm rule

(C) Flemings left hand rule (D) Flemings right hand rule

68. What is the permissible leakage current in domestic wiring installation?

(A) 1/5000 × full load current (B) 1/5 × full load current

(C) 1/500 × full load current (D) 1/500 × short circuit current

69. What is the reason for supplying AC to the electrodes for measuring earth resistance?

(A) Provide electrostatic shield

(B) Protect the coils in the meter

(C) Reduce the value of current in the meter

(D) Avoid the effect of electrolytic emf interference

70. SI unit of permeance :

(A) Ampere turns (B) Henry

(C) Ampere turns/Weber (D) Weber/Square metre

71. Which rule is used to find the direction of induced emf in DC Generator?

(A) Cork screw rule (B) Right hand palm rule

(C) Flemings left hand rule (D) Flemings right hand rule

72. Why Compensating Winding is provided in large DC Generators?

(A) Connect more loads

(B) Reduce commutation effect

(C) Neutralize armature reaction effect

(D) Increase the efficiency of Generator

73. How many parallel paths in Duplex Lap Winding in the armature of 4 pole DC motor?

(A) 2 (B) 4

(C) 6 (D) 8

74. Which DC Motor is suited for Heavy starting torque and high rate accelerated jobs?

(A) DC Series Motor

(B) DC Shunt Motor

(C) DC Differential Compound Motor

(D) DC Cumulative Compound Motor

75. What is the rotor frequency of 3 Phase squirrel cage induction motor at the time of starting?

(A) Equal to supply frequency

(B) 3 times less than supply frequency

(C) 3 times more than supply frequency

(D) $\sqrt{3}$ times less than supply frequency

76. What is the reason to use a permanent capacitor in Fan Motor circuit?

(A) Speed regulation (B) Lower power consumption

(C) Splitting of phase for torque (D) Controlling Electric interference

77. As per IE Rules, clearance of low and medium voltage lines from building, vertical clearance is?

(A) 5 meter (B) 7.5 meter

(C) 3 meter (D) 2.5 meter

78. As per IE Rules, the permissible voltage drop in a lighting circuit is _____ percentage of supply voltage plus 1 volt.

(A) 2 (B) 5

(C) 3 (D) 7

79. The transformer is rated in:

(A) KWH (B) KVA

(C) KW (D) MW

80. The condition for maximum efficiency for DC Generator:

(A) Eddy current loss = stray loss

(B) Hysteresis loss = Eddy current loss

(C) Copper loss = zero

(D) Variable loss = constant loss

81. The impurities like antimony or phosphorus added to intrinsic semiconductor to form :

(A) P-type semiconductor (B) N-type doped semiconductor

(C) A junction diode (D) All of the above

82. What is the meaning of maximum safe reverse voltage rating of a diode?

(A) Knee voltage (B) Breakdown voltage

(C) Reverse breakdown voltage (D) PIV

83. When the depletion region within a PN junction is reduced?

(A) Reverse bias condition (B) No bias applied

(C) Forward bias condition (D) All of these

84. Which is the current ratio Beta (β) in a transistor?

(A) I_C/I_B (B) I_C/I_E

(C) $I_E.I_C$ (D) I_E/I_B

85. The operating point of a transistor is also known as :

(A) turning point (B) pin point

(C) saturation point (D) quiescent point

86. What is the advantage of using bias in transistor circuits?

(A) Easily sets saturation
(B) Give maximum distortion
(C) Never reach saturation
(D) Provides positive feedback

87. The function of a filter circuit in a rectifier is to :

(A) Remove DC components in an output
(B) Remove ripples from rectified output
(C) Supress harmonics in output
(D) Stabilise rectified output voltage

88. The formula for calculating the efficiency of a rectifier is =

(A) lm/π
(B) $V_{AC}/V_{DC} \times 100\%$
(C) $2Vm/\pi R_L$
(D) $P_{DC}/P_{AC} \times 100\%$

89. What is the output frequency of the pulsating DC in a two diode full-wave rectifier?

(A) Double the input AC frequency
(B) Same as that of the input AC frequency
(C) Thrice the input AC frequency
(D) Half of the input AC frequency

90. Which of the transistor amplifier has highest voltage gain given below?

(A) Common base configuration
(B) Common collector configuration
(C) Common emitter configuration
(D) Common anode configuration

91. A sine wave signal when observed on CRO, has positive half cycles measured as 2 divisions horizontally at a scale setting of 50 uS/div. The frequency of the signal is :

(A) 5 KHz
(B) 10 KHz
(C) 100 KHz
(D) 200 KHz

92. In RC phase shift oscillator, Zi is input impedance and Zo is output impedance. Then :

(A) Zi of amplifier = Zo of phase shift network
(B) Zi of amplifier < Zo of phase shift network
(C) Zi of amplifier > Zo of phase shift network
(D) Zo of amplifier > Zi of phase shift network

93. In the following counters, which one cannot count 1011 :

(A) Synchronous counter
(B) Asynchronous counter
(C) Decade counter
(D) Upcounter

94. Which of the following binary combinations are correct?

(i) 100 + 110 = 1010

(ii) 111 + 11 = 1010

(iii) $11 \times 10 = 1010$

(iv) 2's complement of 0110 is 1010

(A) only (i), (ii) and (iii)
(B) only (i), (ii) and (iv)
(C) only (i), (iii) and (iv)
(D) only (ii), (iii) and (iv)

95. If the voltage applied across base terminals of UJT is 12 V and intrinsic stand-off ratio is 0.6, find the minimum voltage at emitter to conduct emitter current :

(A) 0.7 V
(B) 6.5 V
(C) 7.2 V
(D) 7.9 V

96. Which of the following component can be turned on or off by applying proper pulse to the cathode gate?

(A) SCR
(B) SCS
(C) TRIAC
(D) GTO

97. A JFET is biased with potential-divider method. It is desired to set drain current ID = 5 mA. If V_{DD} = 30 V, find the value of gate source voltage VGS? The parameters of JFET are I_{DSS} = 20 mA, V_{GS}(OFF) = –10 V :

(A) – 2.5 V
(B) – 5 V
(C) – 7.5 V
(D) – 10 V

98. Which of the following is / are correct?

(i) AC Drive has rectifier and inverter units

(ii) AC Drive controls speed of AC motor

(iii) VFD is a type of motor controller that adjusts frequency and voltage supplied to the motor, to control its speed

(iv) Microcontrollers are not used in VFD

(A) Only (i), (ii) and (iii)
(B) Only (i), (ii) and (iv)
(C) Only (i), (iii) and (iv)
(D) All of the above (i), (ii), (iii) and (iv)

99. Back-up delay time of inverter is around :

(A) 5 mS
(B) 500 mS
(C) 5 uS
(D) 500 uS

100. Which Flip-Flop have Race around condition?

(A) T Flip-Flop
(B) D Flip-Flop
(C) J-K Flip-Flop
(D) None of these

SPACE FOR ROUGH WORK

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