

121/2021

Maximum : 100 marks

Time : 1 hour and 15 minutes

1. What is the rating factor of cable provided with coarse excess current protection?
(A) 1.14 (B) 1.23
(C) 0.81 (D) 0.787
2. Which type of solder is used for soldering aluminum conductors?
(A) Sal ammonia rosin (B) Ker-al-lite
(C) Zinc chloride (D) Tallow
3. How many electrons are there in the third cell of the copper atom?
(A) 18 (B) 32
(C) 2 (D) 8
4. What is the value of electrical conductivity of aluminium conductor?
(A) 56 mho/meter (B) 81 mho/meter
(C) 61 mho/meter (D) 35 mho/meter
5. Which test is conducted to locate the faults in U.G cables?
(A) Short circuit test (B) External growler test
(C) Insulation resistance test (D) Loop test
6. Which one defines the change in resistance in Ohm (Ω) per degree centigrade ($^{\circ}\text{C}$)?
(A) Temperature co-efficient (B) Laws of resistance
(C) Laws of temperature (D) Joules law
7. In the case of electrolytes a rise in temperature causes :
(A) no change in resistance (B) increase in resistance
(C) decrease in resistance (D) none of the above
8. Calculate the hot resistance of 200W / 250V rated lamp :
(A) 31.25 Ω (B) 312.5 Ω
(C) 62.5 Ω (D) 625 Ω

9. The output voltage of an ideal voltage source is :
- (A) zero (B) constant
(C) dependent on load resistance (D) dependent on internal resistance
10. A semiconductor has generally _____ Valance electrons.
- (A) 6 (B) 3
(C) 2 (D) 4
11. Which method can be used for measuring low and medium value of resistance?
- (A) Substitution method (B) Kelvin bridge method
(C) Voltmeter and ammeter method (D) Wheat stone bridge method
12. The S.I. unit of specific resistance is :
- (A) ohm-meter (B) ohm / cm
(C) ohm / meter (D) micro ohm / cm²
13. According to Kirchhoff's law, the algebraic sign of an 'IR' drop is primarily dependent upon the :
- (A) amount of current flowing it (B) direction of current flow
(C) value of resistance (D) battery connection
14. What is the value of resistance in an open circuit?
- (A) Zero (B) Low
(C) Infinity (D) High
15. What is the unit of Reluctance?
- (A) Weber / metre² (B) Weber / meter
(C) Ampere turns / metre² (D) Ampere turns / Weber
16. Which is the cause for changing the Permeability?
- (A) Flux density (B) Magneto motive force
(C) Field intensity (D) Reluctance
17. A substance that has a high retentiveness can be used for the manufacture of :
- (A) Electromagnet (B) Permanent magnet
(C) Temporary magnet (D) Paramagnets

18. Which is the diamagnetic substance?
(A) Water (B) Air
(C) Steel (D) Platinum
19. The direction of induced e.m.f. can be found with the help of :
(A) Lenz's law (B) Flemings left hand rule
(C) Right hand palm rule (D) Cork screw rule
20. One Weber/second is called :
(A) 1 Ohm (B) 1 Watt
(C) 1 Volt (D) 1 Ampere
21. The magnetizing force required to wipe off residual magnetism is known as :
(A) Retentive force (B) Eddy current loss
(C) Coercive force (D) Relative force
22. The example of natural magnet is :
(A) ALNICO (B) Electro magnet
(C) Nickel – iron (D) Lode-stone
23. Which electrical quantity is directly proportional to the eddy current?
(A) Current (B) Frequency
(C) Voltage (D) Resistance
24. How the value of capacitance can be decreased?
(A) Increasing the distance between the plates
(B) Increasing the plate area
(C) Increasing the resistance of the plate
(D) Using high dielectric constant material
25. Which of the following quantity maintain the same polarity during charging and discharging of a capacitor?
(A) Resistive drop (B) Charge of capacitor
(C) Capacitor Current (D) Capacitor voltage
26. What is the unit of susceptance?
(A) Ohm (B) Weber
(C) Mho (D) Henry

27. What is the formula to find 3 phase Reactive power (Pr) if the line voltage is ' V_L ' and line current is ' I_L '?
- (A) $Pr = \sqrt{3} V_L I_L \sin\theta$ (B) $Pr = \sqrt{3} V_L I_L \cos\theta$
 (C) $Pr = 3 V_L I_L \cos\theta$ (D) $Pr = V_L I_L \sin\theta$
28. What is the main cause for below 0.5 lagging power factor in 3 phase system?
- (A) Fluctuation of voltage
 (B) Reactive power due to more inductive load
 (C) Reactive power due to more capacitive load
 (D) True power due to resistive load
29. A 3-phase, 4 wire, 230/415 volt system is supplying lamp load at 230 volt. If a 3-phase motor is now switched ON across the same supply, then :
- (A) neutral current will increase (B) whole line current will decrease
 (C) neutral current remain unchanged (D) power factor will be improved
30. For plate earthing, plate electrodes thickness when made of G.I or steel should not be less than :
- (A) 1.3 mm (B) 2.15 mm
 (C) 6.3 mm (D) 3.15 mm
31. According to IE rule the leakage current in an installation should not exceed one _____th part of the maximum current supplied to the installation.
- (A) 500 (B) 100
 (C) 5000 (D) 1000
32. The size of the earth continuity conductor in a circuit should be based up on the :
- (A) Voltage of the system (B) Size of largest service conductor
 (C) Size of smallest service conductor (D) Leakage current in the system
33. In surface conduit wiring, saddles should be fitted at intervals of not more than _____ meter.
- (A) 0.5 (B) 1.5
 (C) 0.75 (D) 1
34. In batten wiring, Link clips will have two holes for :
- (A) 50 mm (B) 40 mm
 (C) 30 mm (D) 20 mm

35. According to IE rule, the measured insulation resistance should not be less than :
- (A) 1 ohm (B) 1 kilo ohm
(C) 1 mega ohm (D) 10 mega ohm
36. Eight carbon – zinc cells in series have an output of _____ volt.
- (A) 1.5 (B) 12
(C) 16 (D) 8
37. What is the out voltage of lithium cell?
- (A) 1.2 volt (B) 1.5 volt
(C) 1.8 volt (D) 2.5 volt
38. Which cell is most often used in digital watches?
- (A) Mercury cell (B) Carbon – zinc cell
(C) Voltaic cell (D) Alkaline cell
39. Which is used as an electrolyte in lead acid battery?
- (A) Potassium hydroxide (B) Dilute sulfuric acid
(C) Ammonium chloride (D) Hydrochloric acid
40. What is the effect of buckling defect in lead acid battery?
- (A) Reducing the strength of electrolyte (B) Increasing the internal resistance
(C) Making short between the electrolytes (D) Bending of the electrodes
41. The DC Generator works on the principle of :
- (A) Faraday's law (B) Joules law
(C) Coulomb's law (D) Lenz's law
42. Which type of DC machine poles is residual magnetism necessary?
- (A) Motor (B) Separately excited generator
(C) Shunt motor (D) Permanent magnetic type generator
43. Which type of motor that does not have a commutators?
- (A) DC Shunt (B) AC Series
(C) Repulsion motor (D) Induction motor

44. The lowest starting torque of the motor :
- (A) Universal motor (B) Shaded Pole motor
(C) Capacitor start capacitor run motor (D) Repulsion Motor
45. Hydroelectric power station located :
- (A) Desert area (B) Swamps
(C) Hilly area (D) Grass land
46. The full form of XLPE cable is :
- (A) cross linked polyethylene cable
(B) cross line poly ethylene cable
(C) cross lead paper ethylene cable
(D) cross linked paper ethylene cable
47. Wave winding has ————— parallel path.
- (A) four (B) two
(C) one (D) equal No. of poles
48. In permanent capacitor motor the direction is revised by inter change the :
- (A) Centrifugal switch terminal (B) Supply terminal
(C) Capacitor terminal (D) Auxiliary winding terminal
49. In stay wire ————— type of insulator are used.
- (A) egg type (B) pin type
(C) shackle type (D) suspension type
50. Surge tank is used in to function of :
- (A) supply water in penstock (B) produce surge in the pipe line
(C) avoid water hammering in pen stock (D) none of the above
51. Transformer working on the principal of :
- (A) static induction (B) self induction
(C) dynamic induction (D) mutual induction
52. In normal case inter poles are connected in :
- (A) parallel with the field winding (B) series to the load
(C) series with the field winding (D) parallel to the load

53. While testing a capacitor with a multi meter the needle shows zero position right from the beginning indicator to the capacitor is :
- (A) open circuit (B) in good condition
(C) start circuit (D) change in capacity
54. Transformers are rated in :
- (A) KW (B) KWH
(C) KVR (D) KVA
55. In nuclear power section graphite is used for :
- (A) moderator (B) fuel
(C) coolant (D) electrode
56. In armature core lamination is to reduce :
- (A) Copper loss (B) Eddy current loss
(C) Hysteresis loss (D) Wintage loss
57. In slip induction motor has :
- (A) short circuited rotor (B) double cage rotor
(C) wound rotor (D) none of the above
58. Two transformer operated in parallel will share the load depending upon their :
- (A) per unit impendence (B) efficiency
(C) rating of KVA (D) leakage reactance
59. For low discharge and high load water turbine using in :
- (A) Kaplan (B) Pelton wheel
(C) Francis (D) Propeller
60. In DC generator the emf equation is :
- (A) $E = \frac{\phi ZN}{60} \times \frac{A}{P} \text{ Volt}$ (B) $E = \frac{\phi ZP}{60} \text{ Volt}$
(C) $E = \frac{\phi ZN}{120} \text{ Volt}$ (D) $E = \frac{\phi ZN}{60} \times \frac{P}{A} \text{ Volt}$
61. Thermal over load relay is provided in a starter to protect the motor against :
- (A) short circuit (B) excess current
(C) open circuit (D) low voltage

62. Solar cell are made of :
- (A) Aluminum (B) Germanium
(C) Silicon (D) Cadmium
63. Corona is accompanied by :
- (A) Violet visible discharge in the darkness
(B) Hissing sound and power
(C) Vibration and radio interference
(D) All of the above
64. The solar cell convert in :
- (A) Solar energy into electrical energy
(B) Solar energy into thermal energy
(C) Thermal energy into electrical energy
(D) Chemical energy into electrical energy
65. In welding purpose which type of DC generator is used :
- (A) DC shunt generator (B) DC series generator
(C) DC differential compound generator (D) DC cummlate compound generator
66. The running speed of a 3-phase squirrel cage induction motor is :
- (A) The synchronous speed (B) Less than the synchronous speed
(C) More than the synchronous speed (D) Double the synchronous speed
67. In nuclear reactor usually function :
- (A) fission (B) fusion
(C) both fission and fusion (D) none of the above
68. Which supply source changes the polarity constantly?
- (A) DC supply (B) Dynamic
(C) Battery (D) AC supply
69. The counter e.m.f. oppose :
- (A) Current (B) Applied voltage
(C) Torque (D) Thermal voltage

70. According to NE code the colour code for the neutral :
- (A) Red (B) Blue
(C) Black (D) Green
71. In thermal nuclear reactors for power generation which type of fuel is used :
- (A) U^{238} (B) Th^{232}
(C) Pu^{239} (D) U^{235}
72. Direct current is essential for the function of :
- (A) Arc lamp (B) Mercury Vapor lamp
(C) Sodium Vapor lamp (D) Fluorescent lamp
73. In electric traction which type of motor is used?
- (A) DC shunt (B) DC compound
(C) DC long shunt compound (D) DC series
74. During continuity test in an installation the mugger indicated reading in :
- (A) one mega ohm (B) zero mega ohm
(C) 500 mega ohm (D) infinity mega ohm
75. Biogas consists :
- (A) Methane and carbon dioxide with some impurities
(B) Only Methane
(C) A special Organic Gas
(D) Only Ethane
76. By using the device AC power can convert DC power :
- (A) Generator (B) Alternator
(C) Rectifier (D) Transformer
77. At no load the speed of a DC series motor is :
- (A) normal (B) zero
(C) infinity (D) 3600 rpm
78. NVC used in a starter to protected the motor against :
- (A) short circuit (B) open circuit
(C) excess current (D) low voltage

79. The tridal power plant turbine usually employed in :
- (A) Reaction type (B) Reversible type
(C) Propeller type (D) Simple impulse type
80. The back e.m.f. of a DC motor depends on the :
- (A) field flux (B) shape of the conductor
(C) type of commutator (D) brush material
81. The closeness of the measured value of a quantity, by an instrument, to its true value is known as :
- (A) Error (B) Accuracy
(C) Resolution (D) Precision
82. The basic movement in a permanent magnet moving coil instrument is called as :
- (A) Faraday movement (B) Lenz's movement
(C) d'Arsonval movement (D) d'Alexandre movement
83. Consider a coil having an area of 'A' and with 'N' number of turns be placed between the poles of a permanent magnet. Let 'I' be the current flowing in the coil producing a magnetic flux density of 'B'. Then the resulting deflecting torque 'T_d' exerted on the coil will be :
- (A) $T_d = NBAI$ (B) $T_d = (NBI)/A$
(C) $T_d = N^2BAI$ (D) $T_d = NBI^2$
84. Constant uniform deviation of operation of an instrument due to the instrument itself, observation of the observer or environmental conditions, resulting in errors when taking a measurement is called :
- (A) Gross errors (B) Random errors
(C) Absolute errors (D) Systematic errors
85. The opposing force that brings the pointer in an indicating instrument to its final deflected position by avoiding oscillations is :
- (A) Deflecting torque (B) Damping torque
(C) Controlling torque (D) Indicating torque
86. A transformer is a static device that is used to :
- (i) convert voltage to a higher (step-up) or lower (step down) level
(ii) convert current to a higher (step-up) or lower (step down) level
(iii) convert frequency to a higher (step-up) or lower (step down) level
- (A) both (i) and (ii) (B) both (i) and (iii)
(C) both (ii) and (iii) (D) all (i), (ii) and (iii)

87. An ideal transformer has 900 turns and 90 turns in its primary and secondary windings respectively. If 220 V, 50 Hz AC is applied at its primary, What will be the AC available at its secondary?
- (A) 22 V, 5 HZ AC (B) 2.2 KV, 50 HZ AC
(C) 22 V, 50 HZ AC (D) 2.2 KV, 500 HZ AC
88. When connecting two or more transformers in parallel, a dead short circuit will be produced in the secondary, if :
- (A) the voltage ratio of the primaries and secondaries are not identical
(B) the transformers are not properly connected with regard to the polarity of primary and secondary terminals
(C) the percentage impedance of the transformers are not equal in magnitude
(D) the kVA ratings of the transformers are different
89. The core of a transformer is laminated to reduce :
- (A) Hysterisis losses (B) Copper losses
(C) Saturation losses (D) Eddy current losses
90. The primary and secondary voltages of an auto transformer are 600 V and 300 V respectively. If the secondary current is 90 A, then the primary current is :
- (A) 70 A (B) 30 A
(C) 45 A (D) 100 A
91. A forward biased Silicon diode, will start to conduct when the applied voltage across it reaches :
- (A) 0.7 V (B) 0.3 V
(C) 1.7 V (D) 1.3 V
92. If a source of light emits light equally in all directions, then the Illuminance at any point on a plane perpendicular to the line joining the point and the source is :
- (A) directly proportional to the square of the distance between the source and the plane
(B) inversely proportional to the square of the distance between the source and the plane
(C) directly proportional to the distance between the source and the plane
(D) inversely proportional to the distance between the source and the plane
93. The type of lamp in which gas or vapour is made luminous by an electric discharge through them is :
- (A) Halogen lamp (B) Incandescent lamp
(C) LED lamp (D) Discharge lamp

94. If, for a bipolar junction transistor, $\alpha = 0.99$, then $\beta =$:
- (A) 0.099 (B) 1
(C) 99 (D) 100
95. Reverse breakdown of a PN diode under reverse bias due to increase in kinetic energy of free electrons is called :
- (A) Zener breakdown (B) Avalanche breakdown
(C) Tunnel breakdown (D) Schottky breakdown
96. The majority charge carriers in P type semiconductor are :
- (A) positive ions (B) electrons
(C) negative ions (D) holes
97. When a group V element such as arsenic is added to pure silicon, it results in the type semiconductor referred to as :
- (A) acceptor type (B) donor type
(C) intrinsic type (D) none of the above
98. The type of diode that exhibits negative resistance under low forward bias condition is :
- (A) Varactor diode (B) Zener diode
(C) Schottky diode (D) Tunnel diode
99. When compared to fullwave rectifier, a half wave rectifier is characterised by :
- (A) excessive ripple, small value of rectification efficiency, small value of transformer utilization factor and DC saturation of transformer core
(B) excessive ripple, high value of rectification efficiency, high value of transformer utilization factor and DC saturation of transformer core
(C) lower ripple, small value of rectification efficiency, high value of transformer utilization factor and DC saturation of transformer core
(D) lower ripple, high value of rectification efficiency, small value of transformer utilization factor and DC saturation of transformer core
100. For a bipolar junction transistor to operate in the active region, its :
- (A) collector-emitter junction is forward biased and base-collector junction is reverse biased
(B) base-collector junction is forward and base-emitter junction is reverse biased
(C) base-emitter junction is forward biased and base-collector junction is reverse biased
(D) collector-emitter junction is reverse biased and base-collector junction is forward biased
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