

015/2021

Question Booklet
Alpha Code

A

Question Booklet
Serial Number

Total No. of Questions : 100

Time : 75 Minutes

Maximum : 100 Marks

INSTRUCTIONS TO CANDIDATES

1. The question paper will be given in the form of a Question Booklet. There will be four versions of question booklets with question booklet alpha code viz. A, B, C & D.
2. The Question Booklet Alpha Code will be printed on the top left margin of the facing sheet of the question booklet.
3. The Question Booklet Alpha Code allotted to you will be noted in your seating position in the Examination Hall.
4. If you get a question booklet where the alpha code does not match to the allotted alpha code in the seating position, please draw the attention of the Invigilator IMMEDIATELY.
5. The Question Booklet Serial Number is printed on the top right margin of the facing sheet. If your question booklet is un-numbered, please get it replaced by new question booklet with same alpha code.
6. The question booklet will be sealed at the middle of the right margin. Candidate should not open the question booklet, until the indication is given to start answering.
7. Immediately after the commencement of the examination, the candidate should check that the question booklet supplied to him contains all the 100 questions in serial order. The question booklet does not have unprinted or torn or missing pages and if so he/she should bring it to the notice of the Invigilator and get it replaced by a complete booklet with same alpha code. This is most important.
8. Blank sheets of paper is attached to the question booklet. These may be used for rough work.
9. **Please read carefully all the instructions on the reverse of the Answer Sheet before marking your answers.**
10. Each question is provided with four choices (A), (B), (C) and (D) having one correct answer. Choose the correct answer and darken the bubble corresponding to the question number using Blue or Black Ball-Point Pen in the OMR Answer Sheet.
11. **Each correct answer carries 1 mark and for each wrong answer 1/3 mark will be deducted. No negative mark for unattended questions.**
12. No candidate will be allowed to leave the examination hall till the end of the session and without handing over his/her Answer Sheet to the Invigilator. Candidates should ensure that the Invigilator has verified all the entries in the Register Number Coding Sheet and that the Invigilator has affixed his/her signature in the space provided.
13. Strict compliance of instructions is essential. Any malpractice or attempt to commit any kind of malpractice in the Examination will result in the disqualification of the candidate.

015/2021-A



1. How many electrons are in a Aluminum atom ?
(A) 13 (B) 18
(C) 29 (D) 43
2. What is unit of the quantity of electricity ?
(A) Coulomb (B) Mho
(C) Ohm (D) Ampere
3. What is the working temperature of electrician solder ?
(A) 185 °C (B) 212 °C
(C) 215 °C (D) 315 °C
4. Out of the following which composition of tin and lead used in fine solder ?
(A) 50%, 50% (B) 60%, 40%
(C) 63%, 37% (D) 90%, 10%
5. Which one is equal to one mega ohm ?
(A) 1000000 Ω (B) 10000 Ω
(C) 0.10000000 Ω (D) 100000000 Ω
6. Which effect of electric current is used for soldering iron ?
(A) Chemical effect (B) X-ray effect
(C) Light effect (D) Heating effect
7. How many electrons are in the outer most orbit of intrinsic semi conductor atom ?
(A) Two (B) Three
(C) Four (D) Five
8. The normal current carrying capacity of 1.5 sq: mm copper cable is 16A. What is the current carrying capacity of a cable when protected by coarse excess current protection ?
(A) 13A (B) 14A
(C) 11A (D) 9A

9. What is the conductivity of aluminum conductor when compared to copper conductor of the same size ?
- (A) 45% (B) 55%
(C) 60.6% (D) 40%
10. What is the expansion form of XLPE cable ?
- (A) Zero loss polyethylene (B) Zero lead polyethylene
(C) Cross linked polyethylene (D) Cross line polyethylene
11. Find the value of resistance in a circuit having current 2.5A and voltage applied 230V ?
- (A) 100 Ω (B) 50 Ω
(C) 92 Ω (D) 98 Ω
12. Which law states that in each closed circuit the sum of all voltage drops is equal to zero ?
- (A) Ohm's law (B) Kirchhoff's First law
(C) Current law (D) Kirchhoff's Second law
13. What is the temperature co-efficient of resistance of a semi conductor ?
- (A) Negative (B) Positive
(C) One (D) Zero
14. In electrolysis the positive electrode is called
- (A) Terminal (B) Cathode
(C) Anode (D) Glass jar
15. What is the value of resistivity of copper ?
- (A) 2.4 micro ohm meter (B) 0.017 micro ohm meter
(C) 1.64 micro ohm meter (D) 7.8 micro ohm meter
16. What is the average e.m.f of Leclanche cell ?
- (A) 2V (B) 1.12V
(C) 1.5V (D) 1.3V
17. What is the total output voltage if five cells of 1.5V are connected in parallel ?
- (A) 7.5V (B) 1.5V
(C) 5V (D) 8V

18. Which one of the harmful gas evolves at the time of charging a lead acid battery ?
- (A) Neon (B) Oxygen
(C) Nitrogen (D) Hydrogen
19. What is the method of charging the battery is called when the battery is charged at very low rate ?
- (A) Constant voltage method
(B) Trickle charge method
(C) Constant current method
(D) Diode method
20. The bending of electrodes of lead acid cell due to overcharging and discharging, improper electrolyte and temperature known as
- (A) Sulphation (B) Sedimentation
(C) Buckling (D) Local action
21. What kind of magnetic substance is Water ?
- (A) Ferro magnetic (B) Non magnetic
(C) Para magnetic (D) Dia magnetic
22. In what direction internally the magnetic lines of force travel in bar magnet ?
- (A) North to south (B) South to north
(C) South to south (D) North to north
23. What will happen if a bar magnet is broken in to two pieces ?
- (A) Magnetic property will be destroyed
(B) Each piece will become a separate magnet
(C) One pieces will have only North Pole
(D) None of these
24. What is the directional indication of middle finger according to Flemings Right Hand Rule ?
- (A) direction of Induced emf (B) direction of flux
(C) direction of motion (D) direction of force

25. Which law states that the magnitude of the induced emf is directly proportional to the rate of change of flux linkage ?
 (A) Faraday's First Law of Electromagnetic Induction
 (B) Lenz's law
 (C) Faraday's Second Law of Electromagnetic Induction
 (D) End rule
26. What is the expansion form MMF as regarding of electromagnetism ?
 (A) magneto moto force (B) magnetic moto force
 (C) magneto motive force (D) magnetic motor force
27. The property of magnet which opposes magnetic flux through is called
 (A) Permeability (B) Residual magnetism
 (C) Reactance (D) Reluctance
28. What is the unit of magnetic flux density ?
 (A) Ampere-turns (B) Weber
 (C) Ampere/cm² (D) Web/m²
29. Three capacitors 25 mfd, 125 mfd and 150 mfd are connected in parallel, find the value of total capacitance.
 (A) 25 mfd (B) 150 mfd
 (C) 125 mfd (D) 300 mfd
30. What is the correct relationship between capacitance (C), voltage (V) and electric charge (Q) ?
 (A) $C = Q/V$ (B) $C = V \times Q$
 (C) $Q = V/C$ (D) $V = C \times Q$
31. Which of the following average value of AC sine wave ?
 (A) $0.637 I_{max}$ (B) $6.37 I_{max}$
 (C) $0.707 I_{max}$ (D) $7.07 I_{max}$
32. The ratio of effective value to average value of half cycle is called as
 (A) Q factor (B) Form factor
 (C) Power factor (D) Rating factor
33. What is the unit of susceptance ?
 (A) Henry (B) Ohm
 (C) Mho (D) Volt

34. In which of the following load power factor is unity ?
(A) Capacitive load
(B) Pure Resistive load
(C) Inductive reactance with resistance
(D) Non capacitive with inductive load
35. What is the minimum dimension of copper earth plate as per Indian standards ?
(A) 60 cm × 60 cm × 3.15 mm
(B) 60 cm × 30 cm × 6.38 mm
(C) 60 cm × 60 cm × 6.38 mm
(D) 40 cm × 40 cm × 6.18 mm
36. What is the minimum internal diameter of G.I pipe for pipe earthing as per Indian standards ?
(A) 32 mm
(B) 38 mm
(C) 28 mm
(D) 25 mm
37. What is the expansion form of RCCB ?
(A) Residual current control breaker
(B) Residual control circuit breaker
(C) Residual current circuit breaker
(D) Residual circuit current breaker
38. As per IE Rule 48, the maximum permissible voltage drop in a power industrial circuit should not more than
(A) 10% of the declared supply voltage
(B) 9% of the declared supply voltage
(C) 15% of the declared supply voltage
(D) 5% of the declared supply voltage
39. What is the maximum load in a sub-circuit as per IE Rule regarding internal wiring ?
(A) 800 W
(B) 900 W
(C) 1000 W
(D) 700 W
40. According to Indian standards, the insulation resistance of any wiring installation should not be less than _____.
(A) 10 MΩ
(B) 18 MΩ
(C) 20 MΩ
(D) 1 MΩ

41. Working principle of DC generator based on
 (A) Fleming's Left Hand Rule
 (B) Fleming's Right Hand Rule
 (C) Faraday's laws of electromagnetic induction
 (D) Lenz's law
42. In DC machine of number of commutator segments is equal to
 (A) no. of poles
 (B) no. of conductors
 (C) no. of armature coils
 (D) two times of no. of poles
43. In DC generators lap winding is used for
 (A) low voltage, low current
 (B) high voltage, low current
 (C) high voltage, high current
 (D) low voltage, high current
44. Which type generator used for ARC welding ?
 (A) Over compound
 (B) Under compound
 (C) Differential compound
 (D) Level compound
45. As per BIS of the minimum value of insulation resistance required for low and medium voltage rated machines
 (A) 0.1 mega ohm
 (B) 10 mega ohm
 (C) 1 mega ohm
 (D) 0.5 mega ohm
46. What happened if the field flux of a DC motor reduced to half ?
 (A) Speed remains same
 (B) Speed decreased
 (C) Speed decreased two times
 (D) Speed increased to two times
47. The direction of rotation of DC series motor can be changed by
 (A) Interchanging supply terminals
 (B) Interchanging field terminals
 (C) Either (A) or (B) of above
 (D) None of the above
48. Which starter used for control the speed of DC motor above rated speed
 (A) Four point starter
 (B) Three point starter
 (C) Either (A) or (B)
 (D) Two point starter
49. The yoke of a DC generator is usually made of
 (A) Cast Iron
 (B) Stainless Steel
 (C) Copper
 (D) Silicon steel
50. In over compound generator full load terminal voltage is
 (A) equal to no load terminal voltage.
 (B) more than no load terminal voltage.
 (C) less than.
 (D) almost Zero.

51. Why the double cage rotor of a 3-phase squirrel cage induction motor is short circuited ?
 (A) To reduce the slip (B) For quick starting
 (C) For pulling more load (D) To maintain good torque
52. Why the rotor bars of a 3 phase squirrel cage induction motor are mounted in a slightly skewed position ?
 (A) To avoid magnetic locking (B) To maintain constant speed
 (C) To run with more load than rated (D) To increase the efficiency of motor
53. Why starter is necessary for the operation of 3 phase induction motors ?
 (A) To protect the motor from leakage
 (B) To protect the motor from over load
 (C) To protect the motor from over voltage
 (D) To protect the motor from under voltage
54. What is the rating of backup fuse to be provided for a 10HP AC 3 phase squirrel cage induction motor ?
 (A) 16 Amps (B) 20 Amps
 (C) 25 Amps (D) 63 Amps
55. What is the amount of torque reduced while the motor is running in star connection compared to delta connection ?
 (A) 1/6 Times (B) 1/3 Times
 (C) $\sqrt{3}$ Times (D) 3 Times
56. Which type of the starters are suitable for three phase squirrel cage induction motor from 20 to 150 HP ?
 (A) Rotor - resistance starter (B) Auto Star - delta starter
 (C) Auto transformer starter (D) Manual star delta starter
57. Which type of single phase motor is having a commutator ?
 (A) Stepper motor (B) Repulsion motor
 (C) Shaded pole motor (D) Permanent capacitor motor
58. Which places capacitor start, capacitor run induction motor are used ?
 (A) Wet grinders (B) Compressors
 (C) Water pump motor (D) Washing machines
59. Which motor is used in ceiling fan ?
 (A) Universal Motor (B) Shaded Pole motor
 (C) Permanent capacitor motor (D) Capacitor start, capacitor run motor

60. Which type of motors develops more horse power per Kilogram weight ?
 (A) Universal motor (B) Repulsion motor
 (C) Reluctance motor (D) Shaded pole motor
61. Which method of power generation has low production and maintenance cost ?
 (A) Tidal (B) Hydro Electric
 (C) Nuclear (D) Wind
62. Which method of power generation is most complex ?
 (A) Nuclear (B) Water
 (C) Fuels (D) Solar
63. An example for conventional type power generation
 (A) Hydro (B) Wind
 (C) Tide (D) Sun
64. Economiser used to heats
 (A) Air (B) Steam
 (C) Fuel (D) Feed Water
65. In nuclear reactor which material used as a moderator ?
 (A) Uranium (B) Graphite
 (C) Cadmium (D) Sodium
66. Which is not a major considerable point in site selection of Hydro electro power stations ?
 (A) Availability of Water (B) Transportation Facilities
 (C) Cost and type of land (D) Load Centre
67. Which turbine is used in high head ?
 (A) Reaction turbine (B) Kaplan turbine
 (C) Impulse turbine (D) Francis turbine
68. A Low head Hydroelectric plants has an operating head
 (A) 50 mtr (B) Below 30 mtr
 (C) Above 30 mtr (D) Above 300 mtr
69. Which condition is not cause for power loss in solar panels ?
 (A) Loading (B) Tilt angle
 (C) Temperature (D) Light intensity
70. The major disadvantage of wind power generation is
 (A) Long time to construct
 (B) Require high technology
 (C) Polluting
 (D) Wind power is not constant and steady

71. Which system is universally adopted for power transmission ?
(A) DC system (B) AC Single Phase System
(C) AC Two Phase System (D) Three Phase Three Wire System
72. Primary distribution Voltage is
(A) 33 kV (B) 415 V
(C) 3.3 kV (D) 11 kV
73. Disadvantage of DC transmission system
(A) Requires two wire
(B) Problem of Inductance and capacitance in transmission lines
(C) Generation of high DC Voltage is difficult
(D) High corona loss
74. In terminating on corner poles which insulator is used ?
(A) Stay insulator (B) Suspension Insulator
(C) Shackle insulator (D) Pin type insulator
75. Minimum height required usage of strain insulator
(A) 2 m (B) 4 m
(C) 3 m (D) 5 m
76. Minimum vertical clearance required between two live conductors in LT lines on the same support is
(A) 30 cm (B) 20 cm
(C) 8 cm (D) 45 cm
77. Galvanized steel wires used in ACSR conductors to increase
(A) Conductivity (B) Durability
(C) Tensile strength (D) Strength
78. As per IE rules medium line voltage is
(A) below 250V (B) below 440V
(C) below 11000V (D) below 650V
79. Which factor is not affect the corona ?
(A) Line voltage (B) Line current
(C) Conductor size (D) Atmosphere
80. Permissible span length of wooden poles is
(A) 50-80 mtr (B) 60-100 mtr
(C) 30-50 mtr (D) 40-50 mtr

81. Which of the following is not an indicating instrument ?
- (A) Voltmeter (B) Ammeter
(C) Ampere hour meter (D) Wattmeter
82. EMF equation of transformer
- (A) $2.22 fN\phi_m$ (B) $4.44f^2N\phi_m$
(C) $4.44fN^2\phi_m$ (D) None of these
83. Transformation ratio of a transformer is
- (A) $\frac{E_2}{E_1} = \frac{N_2}{N_1}$ (B) $\frac{E_1}{E_2} = \frac{N_2}{N_1}$
(C) $\frac{E_2}{E_1} = \frac{I_2}{I_1}$ (D) $\frac{E_1}{E_2} = \frac{I_1}{I_2}$
84. Primary Ampere turns I_1N_1 of a transformer is equal to
- (A) I_1N_2 (B) I_2N_2
(C) I_2N_1 (D) None of these
85. Which instrument is used to measure only DC values ?
- (A) M1 Voltmeter (B) PMMC instrument
(C) MI ammeter (D) Dynamometer type instrument
86. Tangent galvanometer is a/an _____ instrument.
- (A) recording (B) indicating
(C) integrating (D) absolute
87. _____ causes the moving system of the instrument to move from its 'zero' position, when the instrument is connected to the supply.
- (A) Deflecting torque (B) Gravity control
(C) Spring control (D) Damping torque

88. All day efficiency of transformer is

- (A) $\frac{\text{Output kWh in 24 hrs}}{\text{Output kWh in 24 hrs} + \text{Loss in 24 hrs}}$
- (B) $\frac{\text{Input kWh in 24 hrs}}{\text{Input kWh in 24 hrs} + \text{Loss in 24 hrs}}$
- (C) $\frac{\text{Input kWh in 24 hrs}}{\text{Input kWh in 24 hrs} - \text{Losses in 24 hrs}}$
- (D) $\frac{\text{Output kWh in 24 hrs}}{\text{Input kWh in 24 hrs} - \text{Losses in 24 hrs}}$

89. Efficiency of a transformer is usually

- (A) 70 – 80% (B) 60 – 70%
- (C) Above 90% (D) 50 – 80%

90. In a/an _____ instrument the pointer will oscillate before coming to final deflected position.

- (A) Over-damped (B) Under-damped
- (C) Critical damped (D) Dead beat

91. To obtain more holes, a pure silicon crystal is doped with _____.

- (A) Arsenic (B) Antimony
- (C) Phosphorous (D) Boron

92. _____ gas is filled in incandescent lamp.

- (A) Argon (B) Sodium
- (C) Mercury vapour (D) Neon

93. Unit of luminous flux

- (A) candela (B) flux
- (C) candle power (D) lumens

94. Illumination of a surface is inversely proportional to _____.
- (A) square of the distance from source
 - (B) distance from source
 - (C) square root of the distance from source
 - (D) cube of the distance from the source
95. Barrier potential of silicon diode is approximately
- (A) 0.3V
 - (B) 0.4V
 - (C) 0.7V
 - (D) 0.9V
96. Atomic number of Germanium
- (A) 38
 - (B) 30
 - (C) 32
 - (D) 34
97. Luminous efficiency is measured in
- (A) Lumens/Wh
 - (B) Candle Power/Watt
 - (C) Candela/Watt
 - (D) Lumens/Watt
98. Which is an active component ?
- (A) Resistors
 - (B) Diodes
 - (C) Capacitors
 - (D) Inductors
99. The emitter of a transistor is _____.
- (A) moderately doped
 - (B) heavily doped
 - (C) lightly doped
 - (D) not doped
100. Visible light is the radiation in that part of the spectrum between approximately _____.
- (A) 250 nm to 375 nm
 - (B) 340 nm to 630 nm
 - (C) 380 nm to 740 nm
 - (D) 480 nm to 940 nm

SPACE FOR ROUGH WORK

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