

113/23

Question Booklet Alpha Code

A

A

Question Booklet Sl. No.

Total Number of Questions : 100

Time : 90 Minutes

Maximum Marks : 100

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/her 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. A blank sheet of paper is attached to the Question Booklet. This 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.

A

1. Match the items in List – 1 to List – 2 :

List – 1

1. Current
2. Potential difference
3. Resistance

List – 2

- I. Volt
- II. Ohm
- III. Ampere
- IV. Coulomb

A) 1 – I, 2 – IV, 3 – III

B) 1 – II, 2 – I, 3 – III

C) 1 – III, 2 – I, 3 – II

D) 1 – IV, 2 – I, 3 – II

2. One coulomb charge equal to the charge of

A) 1.6×10^{19} protons

B) 10^3 protons

C) 16×10^{18} protons

D) 6.24×10^{18} protons

3. A conductor carries 7 coulomb charge for a duration of 10 seconds then the current through the conductor is equal to

A) 0.7 A

B) 1.4 A

C) 70 A

D) 17 A

4. From the following options which one is correct regarding conductor, insulator and semiconductors ?

A) Energy gap between valance and conduction band is low in insulators

B) Large number of free electrons are available in the conduction band of semiconductors than conductors

C) The valance band and conduction band overlaps in conductors

D) Valance band electrons can easily moved into conduction band in insulators

5. From the given options select the list of insulators.

A) Gold, Silver, Copper

B) Glass, Paper, Aluminium

C) Silicon, Glass, Iron

D) Mica, Wood, Paper

6. If a material having forbidden energy of 6 electron volt. Identify the type of material.

A) Conductor

B) Insulator

C) Semiconductor

D) Resistor

7. Identify the requirements of a good insulating material in a cable.

I. High dielectric strength.

II. Low mechanical strength.

III. Able to withstand temperature from –30 degree celcius to over 100 degree celcius.

IV. High insulation resistance.

A) I and II only

B) I, II and IV only

C) I, III and IV only

D) I, II, III and IV

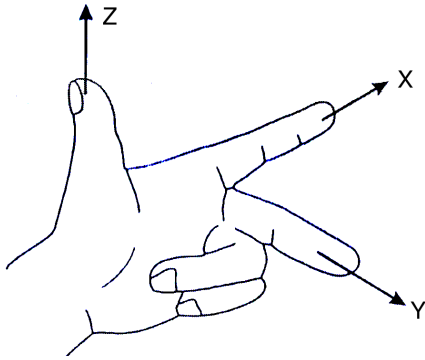
8. Read the statements and choose the correct option.
 1. Wire wound resistors are used for high current applications.
 2. Carbon composition resistors are used for small power applications.

A) 1 and 2 are correct B) 1 correct and 2 is wrong
 C) 1 wrong and 2 is correct D) 1 and 2 are wrong
9. The function of flux in soldering is
 - A) Reduce temperature of soldering process
 - B) To keep the metal surface clean and oxide free
 - C) Reduce melting point of solder
 - D) To reduce the time of soldering process
10. Identify the effect of aluminium impurity in tin-lead solder from the following.
 - A) Reduces the flow of solder
 - B) Wetting decreases significantly
 - C) Final melting point of solder increases
 - D) Surface deterioration of molten solder
11. From the given statements which are related to para magnetic materials ?
 - I. The substance are weakly magnetized when placed in an external magnetic field.
 - II. The substances move from weak field region to strong field region in a non-uniform magnetic field.
 - III. Magnetic susceptibility is negative.
 - IV. Relative permeability is less than one.

A) I and II only B) I only C) I, II and III only D) I, II, III and IV
12. From the following properties identify the type of magnetic material.
 - I. A magnetic material with susceptibility is low and negative.
 - II. They tend to move from high field region to low field region under the influence of non-uniform magnetic field.

A) Para magnetic material B) Ferro magnetic material
 C) Ferri magnetic material D) Diamagnetic material
13. When a conductor is moved to south direction in a magnetic field which is directed upwards. Then the direction of current in the conductor will be
 - A) Towards east B) Towards west
 - C) Towards downward D) Towards north

14. Identify the correct sequence related to Fleming left hand rule.



- A) X- force, Y-current, Z-magnetic field B) X-magnetic field, Y-current, Z-force
 C) X-current, Y-magnetic field, Z-force D) X-magnetic field, Y-force, Z-current
15. From the following options which is correct related to reluctance of a magnetic material ?
- A) Reluctance is directly proportional to length and inversely proportional to the area of the material
 B) Reluctance is directly proportional to length and permeability of the material
 C) Reluctance is directly proportional to area and permeability of the material
 D) Reluctance is directly proportional to area and inversely proportional to length of the material
16. If an electromagnet contains 100 turns and carries a current of 5 A. Find the reluctance if the flux produced by the electromagnet is 0.2 webber.
- A) 2500 AT/web B) 100 AT/web C) 0.004 AT/web D) 500 AT/web
17. Tesla is the unit of
- A) Magneto motive force B) Magnetic field strength
 C) Magnetic flux density D) Magnetic flux
18. Find the number of turns in the coil if an emf of 40 volt developed across it with a flux change in the rate of 0.8 web/second.
- A) 50 B) 100 C) 32 D) 2
19. If the capacitance of a parallel plate capacitor is 'C'. The area of conductor is doubled and distance of separation between conductors is halved then the change in capacitance equal to
- A) C B) C/2 C) 2C D) 4C

20. If two capacitors C_1 and C_2 are connected in series. Then the value of effective capacitance should be
- A) Greater than C_1 and C_2 B) Less than C_1 and C_2
C) Greater than C_1 but less than C_2 D) In between C_1 and C_2
21. From the given statements choose the correct one which are related to law of resistance ?
- I. Resistance is directly proportional to length of material.
II. Resistance is inversely proportional to area of cross section.
III. Resistance depends on the nature of material.
- A) I only B) I and II only C) I, II and III D) II only
22. If the length and area of a material is doubled then change in resistance of material is
- A) Resistance is doubled B) Resistance halved
C) Resistance remains the same D) Resistance become 4 times of initial value
23. Choose the material with positive temperature coefficient of resistance.
- A) Silicon B) Carbon C) Copper D) Germanium
24. Two lamps each of rating 100 Watt and 200 Volt which are connected in series. Find effective resistance of the circuit.
- A) 50 ohm B) 100 ohm C) 400 ohm D) 800 ohm
25. If 20 ohm and 30 ohm resistor are connected in series across 200 volt supply. Find voltage drop across 30 ohm resistor.
- A) 200 volt B) 120 volt C) 80 volt D) 100 volt
26. From the following find out the reason for buckling effect in cells.
- I. Over charging.
II. Continuous operation of battery in discharge.
III. Non-uniform distribution of current in plates.
- A) I and II B) I only C) II only D) I, II and III
27. Electroplating is based on
- A) Heating effect of electricity B) Chemical effect of electricity
C) Physical effect of electricity D) Magnetic effect of electricity

36. What will happen to the value of earth resistance if length of the earth pipe is increased ?
 A) Remain same B) Increases C) Decreases D) Infinity
37. Which method of cable laying is suitable for congested areas ?
 A) Racks in air B) Duct pipes C) Along buildings D) Direct in ground
38. Where system earthing is done ?
 A) Generating station B) Electroplating installation
 C) Small industrial installation D) Domestic wiring installation
39. What is the term for the time taken by a fuse to interrupt the circuit in fault ?
 A) Time factor B) Fusing factor C) Cut-off factor D) Fusing current
40. Which electrical equipment is provided with L series MCB ?
 A) General lighting B) Motors
 C) Air conditioner D) Halogen lamp
41. Which rule is used to find the direction of induced emf in D.C. generator ?
 A) Cork screw rule B) Right hand palm rule
 C) Fleming's left-hand rule D) Fleming's right hand rule
42. What is the formula for dynamically induced emf ?
 A) BLV volts B) BL sin θ volts C) BLV sin θ volts D) BLV cos θ volts
43. What is the name of generator, if its field is connected in parallel with armature ?
 A) Shunt generator B) Series generator
 C) Compound generator D) Self excited generator
44. What is the property of wave winding in D.C. generator ?
 A) Low current low voltage B) High current low voltage
 C) Low current high voltage D) High current high voltage
45. What is the effect if the shunt field resistance is above critical resistance value in a D.C. generator ?
 A) Output voltage is pulsating B) Output voltage is above normal
 C) Generator fails to build up voltage D) Generator builds up voltage normally

46. What is the purpose of series resistor connected with holding coil in a D.C. four point starter ?
- A) Limit the current in holding coil
 - B) Increase the current in holding coil
 - C) Increase the voltage in holding coil
 - D) Decrease the voltage in holding coil
47. Why the direction of rotation is changed only by changing the armature current direction in a D.C. compound motor ?
- A) Maintain rated speed
 - B) Maintain motor characteristics
 - C) Avoid armature reaction effect
 - D) Prevent motor from over loading
48. Which speed control methods offers below normal speed in DC shunt motor ?
- A) Field control method
 - B) Voltage control method
 - C) Armature control method
 - D) Ward Leonard system of speed control
49. Why the D.C. series motor field winding is wound with thick wire ?
- A) To regulate field voltage
 - B) To carry the load current
 - C) To keep maximum inductance
 - D) To reduce the armature reaction
50. Which type of instrument is used to test the armature winding ?
- A) Megger
 - B) Growler
 - C) Multimeter
 - D) Ohmmeter
51. To convert galvanometer into ammeter
- A) A very high resistance is connected in series or in parallel
 - B) A high resistance is connected in series
 - C) A low resistance is connected in parallel
 - D) A low resistance is connected in series
52. Which material is used for transformer bushings ?
- A) Porcelain
 - B) Plastic
 - C) Bakelite
 - D) PVC
53. The starting torque of a three phase induction motor is _____ supply voltage.
- A) Inversely proportional to
 - B) Directly proportional to
 - C) Directly proportional to square of
 - D) Independent of
54. In all induction instruments, deflection torque is produced due to the reaction between
- A) Voltage and current
 - B) Flux and eddy currents
 - C) Two eddy currents
 - D) Two alternating fluxes

55. In a shaded pole motor the revolving field is produced by
 - A) winding
 - B) capacitor
 - C) regulator
 - D) shading ring
56. How the voltage is reduced in auto transformer starter at the time of starting ?
 - A) by adding resistance with rotor
 - B) by reducing supply current
 - C) by using step down transformer
 - D) by adjusting the tappings by handle
57. Maximum efficiency for a transformer can expect when
 - A) Hysterisis loss becomes equal to eddy current loss
 - B) Copper loss becomes equal to constant loss
 - C) Variable loss becomes equal to stray loss
 - D) Eddy current loss becomes equal to copper loss
58. Which one is the application of Current Transformer (CT) ?
 - A) Tong tester
 - B) Earth leakage circuit breaker
 - C) Auto transformer
 - D) Variac
59. Synchronous motor when used for power factor improvement should be
 - A) loaded
 - B) under excited
 - C) over excited
 - D) running at no load
60. The following _____ type is not a wattmeter.
 - A) electrostatic
 - B) induction
 - C) electro mechanical
 - D) dynamometer
61. Phase sequence of supply given to AC motor means the order of phase attaining
 - A) R. M. S value
 - B) Maximum value
 - C) Average value
 - D) Average inverse value
62. If the ceiling fan when switched on runs at slow speed in the reverse direction, it can be concluded that
 - A) Winding has burnt out
 - B) Bearing has worn out
 - C) Capacitors is not effective
 - D) Shorted winding
63. In a wound three phase induction motor, brushes should be connected to
 - A) Equalizing coils
 - B) External DC excitation
 - C) External connected resistors
 - D) Stator power supply

64. _____ of transformers are used for high power.
 A) Shell type B) Berry type C) CT type D) Core type
65. Moving coil instrument works on the effect of
 A) Electromagnetic effect B) Heating effect
 C) Chemical effect D) Electrostatic effect
66. In an induction motor, if the flux density of rotor is reduced to half of its normal value, the torque will
 A) Reduce to half B) Reduce to one fourth
 C) Increase three folds D) Remain unchanged
67. In a transformer minimum voltage regulation occurs when the power factor of the load is
 A) lagging B) leading C) 0.8 D) unity
68. A dynamometer type wattmeter has
 A) Non-linear scale B) Logarithmic scale
 C) Square law scale D) Uniform scale
69. Vacuum cleaners generally use _____ motor.
 A) universal B) shaded pole C) hysteresis D) reluctance
70. Which is the cause for deterioration of transformer oil ?
 A) Insufficient cooling
 B) Long time and continuous use
 C) Due to atmosphere air come into contact with oil
 D) Due to over load
71. The laws of illumination are applicable
 A) To a point source of light in the absence of reflecting surfaces
 B) To a point source of light in the presence of reflecting surfaces
 C) Irrespective of whether the source of light is a point source or extended source
 D) Both A) and B)
72. A total of 20 fluorescent lamps are required to illuminate a surface of 100m^2 with an illumination of 200 lux, taking coefficient of utilisation as 0.5 and depreciation factor as 1.25. Find out the lumen output of the lamp.
 A) 2000 lumens B) 2500 lumens C) 625 lumens D) 1600 lumens

73. An incandescent lamp, hung at a height 'h' from a point 'P', directly below it, produces an illumination 'E' at 'P'. If the height was reduced by $\frac{h}{4}$, what will be the new illumination at 'P' ?
 A) $\frac{E}{4}$ B) $\frac{E}{16}$ C) 16E D) None of these
74. Which one of the following lamps operates at the best power factor ?
 A) Fluorescent lamp B) Sodium vapour lamp
 C) LED lamp D) Incandescent lamp
75. Which one among the following lighting schemes produces minimum glare ?
 A) Direct lighting B) Semi direct lighting
 C) Indirect lighting D) Semi indirect lighting
76. The voltage drop across an ideal diode when forward biased is
 A) 0.7 V B) 0.3 V C) 1.1 V D) None of these
77. In a DC power supply, a voltage regulator is used to
 A) Keep the output DC voltage constant irrespective of variations in input voltage
 B) Keep the output DC voltage constant irrespective of variations in load current
 C) Both A) and B)
 D) None of these
78. What happens when a zener diode is forward biased ?
 A) Avalanche breakdown occurs B) Zener breakdown occurs
 C) It blocks the flow of current D) None of these
79. In an L-section filter
 A) Both inductor and capacitor are connected in series with respect to the load
 B) Both inductor and capacitor are connected in parallel with respect to the load
 C) Inductor is connected in series and capacitor is connected in parallel with respect to the load
 D) Inductor is connected in parallel and capacitor is connected in series with respect to the load
80. Choose the incorrect statement regarding a pure semiconductor.
 A) It behaves as a perfect insulator at absolute zero temperature
 B) Its resistivity decreases with increase in temperature
 C) It obeys Ohm's law
 D) It is also called intrinsic semiconductor

81. The type of generators used in hydroelectric power plants is usually
 A) Salient pole type alternator B) Cylindrical rotor type alternator
 C) Pelton wheel D) None of the above
82. Which among the following pairs are not matched ?
 A) Hydro electric Power Plant – Alternator B) Wind Power Plant – Induction motor
 C) Solar Power Plant – PV Cell D) Thermal Power Plant – Alternator
83. MPPT is not used in
 A) Solar Power Plant B) Wind Power Plant
 C) Hydroelectric Power Plant D) Both A) and B)
84. Which one among the following conditions is most desirable for a power station ?
 A) High load factor and high diversity factor
 B) High load factor and low diversity factor
 C) Low load factor and high diversity factor
 D) Low load factor and low diversity factor
85. Which one among the following statements is not true regarding generating stations ?
 A) Nuclear power stations are more suitable for meeting base load
 B) The load on a power station does not remain constant throughout the day
 C) A high value of load factor indicates a highly variable load on the power station
 D) Value of diversity factor is always greater than 1
86. Which one among the following statements is not true for an interconnected Grid System ?
 A) It helps in reducing the plant reserve capacity
 B) It increases the reliability of supply
 C) Interconnected grid system avoids the use of old and less efficient plants
 D) It helps in increasing the diversity factor of the system
87. Pick the odd one out.
 A) Surge tank B) Economiser C) Penstock D) Dam
88. Which one among the following statements is not true regarding a Nuclear Power Station ?
 A) Heat energy is produced through the process of nuclear fission.
 B) Nuclear power plants are suitable for supplying power to frequently varying loads.
 C) In a nuclear reactor, controlled chain reaction is used.
 D) The capital cost on a nuclear power plant is comparatively very high.

89. Choose the correct order of components with respect to solar photovoltaic systems.
- A) PV Cell → PV Module → PV Array → PV Panel
 - B) PV Cell → PV Module → PV Panel → PV Array
 - C) PV Module → PV Cell → PV Panel → PV Array
 - D) PV Array → PV Module → PV Cell → PV Panel
90. Mention the main component of Biogas.
- A) Ethane
 - B) Methane
 - C) Butane
 - D) Carbon dioxide
91. Choose the incorrect statement from the given options.
- A) Power factor improvement reduces voltage drop across the transmission lines.
 - B) The phenomenon in which receiving end voltage is less than sending end voltage is known as Ferranti effect.
 - C) A conductor offers more resistance to ac as compared to dc.
 - D) 3 phase power is constant whereas single phase power is pulsating.
92. Which of the following is not true with respect to HVDC transmission ?
- A) Charging current is totally absent
 - B) Series and shunt compensations are not required
 - C) Corona loss is less as compared to HVAC transmission
 - D) The distance of transmission should be below a minimum value for HVDC transmission to become economical
93. In HVDC transmission, increase in transmission voltage,
- A) Allows to reduce the size of conductors used
 - B) Improves the power factor
 - C) Increases the copper loss in the transmission lines
 - D) Reduces skin effect
94. Which one among the following phenomena does not take place in high voltage AC transmission ?
- A) Ferranti effect
 - B) Skin effect
 - C) Corona
 - D) None of these

95. Effect of series inductance and shunt capacitance of transmission lines are faced in
- A) EHVAC Transmission
 - B) HVDC Transmission
 - C) Both EHVAC and HVDC transmissions
 - D) None of these
96. In a 3 phase 4 wire $\frac{415}{240}$ V system, a 40 W lamp is connected across R-phase and neutral and a 100 W lamp is connected across Y-phase and neutral. What happens when the neutral is disconnected ?
- A) Short circuit occurs
 - B) 40 W lamp glows brighter than 100 W lamp
 - C) 100 W lamp glows brighter than 40 W lamp
 - D) None of these
97. Pick the odd one out.
- A) Lighting arrester B) Ground wires C) Earthing screen D) Guard wires
98. Which one among the following factors does not determine the selection of size of conductor for overhead transmission ?
- A) KVA rating of transformer used B) Length of transmission line
 - C) Power factor D) Power to be carried by the line
99. In India, the frequency of the secondary distribution voltage can vary from
- A) 49.5 Hz to 50.5 Hz B) 49 Hz to 51 Hz
 - C) 48.5 Hz to 51.5 Hz D) 49.5 Hz to 51.5 Hz
100. Reactors connected in series with the feeders (feeder reactors) are used to
- A) Improve the power factor
 - B) Increase the power transmission capability of transmission lines
 - C) Increase the voltage regulation
 - D) Limit the current in case of short circuit
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Space for Rough Work

