

131/2021

Question Booklet
Alpha Code

A

Question Booklet
Serial Number

Total Number of questions : 100

Time : 75 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 unnumbered, 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. 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

DO NOT WRITE HERE

1. Which law states that in closed electric circuit the applied voltage is equal to the sum of the voltage drops?
(A) Ohm's law (B) Law of resistance
(C) Kirchhoff's first law (D) Kirchhoff's second law
2. What is the formula for Quantity of electricity (Q) ?
(A) Current x Time (B) Voltage x Current
(C) Current x Resistance (D) Voltage x Resistance
3. Which one defines the change in resistance in Ohm (Ω) per degree centigrade ($^{\circ}\text{C}$)?
(A) Temperature effect (B) Laws of temperature
(C) Temperature constant (D) Temperature coefficient
4. Resistance of 250V, 100W lamp will be _____
(A) 0.4Ω (B) 25Ω
(C) 625Ω (D) 2.5Ω
5. The resistivity of conductor _____
(A) Decreases with increase of temperature
(B) Increases very slowly by increasing the temperature
(C) Increases sharply by increasing the temperature slightly
(D) Increases very sharply in proportion to the temperature
6. The reciprocal of resistance is _____
(A) Conductance (B) Susceptance
(C) Impedance (D) Reactance
7. What are the three factors essential to make a simple electric circuit?
(A) Switch, Voltage, Fuse
(B) Current, Fuse, Conductor
(C) Electromotive force, Current, Resistance
(D) Potential difference, Quantity of electricity, Resistance
8. If short circuit is occurred in an electric circuit, then the value of resistance will be _____
(A) Low (B) High
(C) Zero (D) Infinity

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9. The current in a series circuit is _____
(A) Same throughout the circuit
(B) Sum of individual resistor's current
(C) Depends Individual resistance value
(D) Calculated by product of resistance and voltage
10. The low value resistance can be measured by _____
(A) Series ohm meter (B) Substitution method
(C) Kelvin bridge method (D) Wheatstone bridge method
11. As per Ohm's law the current is _____
(A) Directly proportional to the voltage
(B) Inversely proportional to the voltage
(C) Directly proportional to the resistance
(D) Inversely proportional to the temperature
12. Ohm's law states the relation between _____
(A) Current, E.M.F. and Voltage
(B) E.M.F. Current and Resistance
(C) Temperature, E.M.F. and Resistance
(D) Voltage, Specific resistance and Resistance
13. The formula to find the current (I) as per Ohm's law is _____
(A) $I = R/V$ (B) $I = V R^2$
(C) $I = V / R$ (D) $I = V R$
14. What is the change of resistance value of the conductor as its diameter is doubled?
(A) Increases to two times
(B) Decreases to four times
(C) Decreases to half of the value
(D) No change in value of the resistance
15. What is the value of resistance in an open circuit ?
(A) Zero (B) Low
(C) High (D) Infinity

16. The parallel circuit is used for _____
(A) House wiring (B) Continuity test
(C) Decorative lighting (D) Ammeter connection
17. Which is the application of series circuit?
(A) Fuse in circuit (B) Voltmeter connection
(C) Electrical lamp in houses (D) Shunt resistor in ammeter
18. In Ohm's law the condition is that
(A) The temperature should vary
(B) The temperature should remain constant
(C) Current should be proportional to voltage
(D) Ratio of V/I should be constant
19. The resistance of a conductor on increasing the temperature
(A) Decreases (B) Remains constant
(C) Increases (D) Varies
20. In a parallel circuit across each resistance
(A) Current divides and voltage remains the same
(B) Voltage divides and Current remains the same
(C) Both divide
(D) Both remains the same
21. The property of a material which opposes the creation of magnetic flux in it is known as
(A) Magnetomotive force (B) Reluctance
(C) Permeance (D) Reluctivity
22. Reciprocal of reluctance is
(A) Susceptibility (B) Permeability
(C) Permeance (D) Reluctivity
23. Direction of forces on a conductor in a magnetic field is determined by _____
(A) Fleming's right hand rule (B) Fleming's left hand rule
(C) Right hand thumb rule (D) None of the above

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24. A property of material which opposes the creation of magnetic flux in it is known as _____
(A) Magnetomotive force (B) Reluctance
(C) Permeance (D) Reluctivity
25. In electrical machines laminated cores are used with a view to reducing _____
(A) Hysteresis loss (B) Eddy current loss
(C) Copper loss (D) All of the above
26. The magnitude of induced e.m.f. is directly proportional to the _____
(A) Rate of change of current
(B) Rate of change of flux linkage
(C) Constant value of current
(D) Constant value of flux linkage
27. Static electromagnetic induction is adopted in _____
(A) Generators (B) Alternators
(C) Transformers (D) All of the above
28. Eddy currents produced in a core _____
(A) Increase useful energy (B) Create loss of useful energy
(C) Strengthen the magnetic field (D) None of the above
29. For an inductance current is proportional to _____
(A) Magnetic field
(B) Voltage across the inductance
(C) Both magnetic field and voltage across the inductance
(D) Neither magnetic field nor voltage across the inductance
30. The electrical current is analogous to the magnetic circuit _____
(A) Flux (B) Reluctance
(C) Flux density (D) Permeability
31. Electric current is defined as _____
(A) Flow of electrons in a conductor
(B) Resistance offered in a circuit
(C) Potential difference in a circuit
(D) Electrons in atomic structure

32. What is the polarity of an AC source?
(A) Positive to ground (B) Negative to positive
(C) Positive to negative (D) Change at regular intervals
33. What is the standard domestic supply voltage in India as per Indian standard?
(A) 240 V (B) 230 V
(C) 220 V (D) 250 V
34. Why AC transmission is preferred to long distance than DC?
(A) Less line losses (B) It is easily available
(C) Easy to carry high current (D) Current carrying capacity is more
35. How much time is required by 50Hz AC supply to complete one cycle?
(A) 0.1 second (B) 0.02 second
(C) 0.15 second (D) 0.45 second
36. What is the equation used to calculate the effective value (V_{rms}) of voltage in a wave?
(A) $V_{rms} = 0.707 V_{max}$ (B) $V_{rms} = 0.637 V_{max}$
(C) $V_{rms} = 1.114 V_{max}$ (D) $V_{rms} = 1.414 V_{max}$
37. In an A.C. circuit, a low value of kVAR compared with kW indicates _____
(A) Unity p.f. (B) High p.f.
(C) Low efficiency (D) None of these
38. In an A.C. circuit, the ratio of kW/kVA represents _____
(A) Form factor (B) Power factor
(C) Load factor (D) None of these
39. In A.C. circuits, laminated iron is used to _____
(A) Reduce eddy current loss (B) Reduce circuit permeability
(C) Make assembly cheap (D) Increase heat radiation
40. An alternating current or voltage is that which
(A) Changes in direction only
(B) Changes in magnitude only
(C) Changes in both magnitude and direction
(D) Has a random movement of electrons

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41. Compound generator is a
(A) Separately excited generator (B) Self excited generator
(C) Series generator (D) Shunt generator
42. In DC lap winding number of parallel path A =
(A) P (B) Z
(C) 60 (D) N
43. What is the emf in a 6 pole lap wound armature having 18 slots, 2 conductor per slot shaft rotating at 100 RPM, flux per pole is 0.1 Wb?
(A) 6V (B) 36V
(C) 18V (D) 60V
44. As per Fleming's right hand rule, middle finger points the direction of
(A) Induced emf (B) Motion of conductor
(C) Flux (D) None of the above
45. Load current of a DC series generator is
(A) equal to shunt field current
(B) equal to series field current
(C) sum of series and shunt field currents
(D) sum of series field and armature currents
46. In a long shunt compound DC generator the shunt field winding is connected in parallel with
(A) Series field
(B) Armature
(C) Parallel connected armature and series field combination
(D) Series connected armature and series field combination
47. The direction of rotation of DC motor can't change by
(A) Changing direction of Armature current
(B) Changing direction of field current
(C) Changing the direction of both armature and field currents
(D) Changing the direction of supply voltage

48. Speed of a DC motor
- (A) Directly proportional to flux
 - (B) Directly proportional of back emf
 - (C) Inversely proportional to supply voltage
 - (D) Can't change by increasing supply voltage
49. Shaft torque in DC motor is
- (A) less than armature torque
 - (B) greater than armature torque
 - (C) equal to armature torque
 - (D) square of armature torque
50. A DC shunt motor is connected with 200V DC supply. It takes a line current of 18A. What will be the Armature current if shunt field resistance is 100Ω ?
- (A) 36A
 - (B) 2A
 - (C) 20A
 - (D) 16A
51. The motor used in mixer grinder
- (A) Stepper motor
 - (B) Universal motor
 - (C) Capacitor start motor
 - (D) Compound motor
52. An Induction motor with 6 poles rotating at a speed of 950 rpm using 50 Hz supply. The percentage of slip is
- (A) 5%
 - (B) 3%
 - (C) 15%
 - (D) 0.5%
53. D.O.L. starter is used to start the motor up to
- (A) 25 HP
 - (B) 5 HP
 - (C) 7.5 HP
 - (D) 100 HP
54. In slip ring induction motor starter 3 external variable resistances are
- (A) Connected in Series with stator circuit
 - (B) Connected in Parallel with stator circuit
 - (C) Connected in Star with rotor circuit
 - (D) Connected in Delta with rotor circuit

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55. Which of the following is suitable for starting squirrel cage induction motor?
(A) Rotor resistance starter (B) 4 point starter
(C) 3 point starter (D) Auto transformer starter
56. DIN rail is used to mount
(A) Push button switches (B) Circuit breakers
(C) Indicating lamps (D) Kit Kat fuses
57. Which of the following is not a method of synchronisation?
(A) Dark lamp method (B) Bright lamp method
(C) Dark and bright lamp method (D) MMF method
58. Centrifugal switch in a centrifugal pump motor is used to control
(A) Supply through the starting winding
(B) Supply through the running winding
(C) Speed of the pump motor
(D) Overload current
59. Speed of a SCIM can be changed by
(A) Varying number of poles
(B) Varying supply phase sequence
(C) Interchanging any two motor terminals
(D) None of the above
60. Growler is a
(A) Armature testing machine (B) Earth testing machine
(C) Coil winding machine (D) Polarity testing machine
61. Moderator is a part of
(A) Tidal power plant (B) Solar power plant
(C) Windmill (D) Nuclear power plant
62. The part which reduces the water hammering effect in hydroelectric power plant system
(A) Reservoir (B) Tail race
(C) Surge tank (D) Pen stock

63. Demand factor X connected load =
(A) Average load (B) Power plant capacity
(C) Maximum demand (D) Average demand
64. Solar P.V. module efficiency will always be
(A) greater than cell efficiency (B) less than cell efficiency
(C) equal to cell efficiency (D) above 1
65. Service lines are the part of
(A) Primary transmission (B) Secondary transmission
(C) Primary distribution (D) Secondary distribution
66. Solar panel output does not depend on
(A) Geographical location (B) Season of the year
(C) Time of the day (D) AH capacity of connected battery
67. Example for non-conventional energy source
(A) Coal (B) Natural gas
(C) Sun (D) Petroleum
68. Conducting media in MHD Tunnel is
(A) Hydrogen (B) Plasma
(C) Solid conductor (D) Super conductor
69. An 8 pole alternator produces 50 Hz supply. What will be the speed in rpm?
(A) 750 (B) 190
(C) 1500 (D) 1200
70. Unit of solar irradiance is
(A) m^2/W (B) W^2/m
(C) W/m^2 (D) m/W^2
71. Advantage of D.C. Transmission system
(A) No inductance (B) No phase displacement
(C) Better voltage regulation (D) All of the above

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72. Skin effect of a conductor
(A) Increases with increase in diameter
(B) Inversely proportional to frequency
(C) More in stranded condition
(D) Less in solid condition
73. Which is provided to prevent the entry of moisture in UG cables?
(A) Bedding (B) Armouring
(C) Metallic sheath (D) Serving
74. Value of fusing factor is always
(A) less than fusing current (B) less than one
(C) more than fusing current (D) greater than one
75. Which effect is accompanied by the production of ozone in OH line?
(A) Skin effect (B) Corona effect
(C) Proximity effect (D) Ferranti effect
76. Sag in overheadline $S = \frac{wl^2}{8T}$, Here 'l' stands for
(A) Length of Pole (B) Length of conductor
(C) Length of span (D) Length of cross arm
77. Buchholz relay is located
(A) In the main tank
(B) In between conservator tank and main tank
(C) In the breather
(D) In between conservator and breather
78. It gives support to the pole against falling
(A) Lightning arrestor (B) Stay set
(C) Cross arm (D) Earth wire
79. Most of the substations are used to
(A) Increase the power (B) Change the frequency
(C) Change the voltage (D) Decrease the power

80. Horn gap type surge diverter is a
(A) Lightning arrester (B) Voltage regulator
(C) Overload tripping contact (D) Air break circuit breaker
81. The transistor configuration used for impedance matching is
(A) CE (B) CB
(C) CC (D) All of the above
82. In PN junction diode the depletion region contains
(A) Electrons (B) Holes
(C) Immobile ions (D) None of the above
83. Peak inverse voltage of centre tapped full wave rectifier is
(A) V_m (B) $2V_m$
(C) $V_m/2$ (D) $V_m/\sqrt{2}$
84. When transistor is used as a switch its region of operation is
(A) Active region (B) Cut-off region
(C) Saturation region (D) Both B and C
85. The forbidden energy gap for silicon semiconductor is
(A) 1.21 eV (B) 0.72 eV
(C) 0.3 eV (D) 5 eV
86. The rectification efficiency of a half wave rectifier is
(A) 81.2% (B) 40.6%
(C) 0.48% (D) 1.21%
87. Unit of luminous flux is
(A) lux (B) lumen
(C) lumen-hours (D) lumen/m²
88. The material which can be used for filaments of incandescent lamps must possess
(A) high melting point (B) low vapour pressure
(C) high resistivity (D) All of the above

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89. According to inverse square law, the illumination of a surface is
(A) directly proportional to distance between surface and the source
(B) directly proportional to square of distance between surface and the source
(C) inversely proportional to square of distance between surface and the source
(D) inversely proportional to distance between surface and the source
90. Electric motor used in mixer grinder is
(A) universal motor (B) capacitor start induction motor
(C) shaded pole motor (D) shunt motor
91. Which one of the following is an indicating type Instrument?
(A) Voltmeter (B) Ammeter
(C) Energy meter (D) Both (A) and (B)
92. The instrument that totalizes events over a specific period of time is called
(A) Recording instrument (B) Indicating instrument
(C) Integrating instrument (D) None of the above
93. Induction type measuring instruments are used for
(A) AC measurements only (B) DC measurements only
(C) Both AC and DC measurements (D) None of the above
94. Calculate the deflection (θ in degrees) for a moving coil instrument with deflection torque (T_d) is given by $30 \mu\text{Nm}$ and control spring constant is $2 \mu\text{Nm/degree}$.
(A) 100 (B) 150
(C) 200 (D) 600
95. Which one of the following is a disadvantage of PMMC (permanent magnet moving coil instrument)?
(A) PMMC can be modified into Ammeter and voltmeter.
(B) PMMC exhibits no hysteresis.
(C) Operation of PMMC is not significantly affected by stray magnetic field.
(D) Errors due to ageing of control spring and the permanent magnet.
96. Which of the following parameters remains unchanged between primary and secondary windings of a step up transformer?
(A) Voltage (B) Current
(C) Resistance (D) Frequency

97. Which one the following is NOT a criterion for the parallel operation of transformer?
- (A) The transformers are to be connected properly so that the net voltage around the local loop is not zero.
 - (B) Three phase transformers must have zero relative phase displacement on the secondary sides.
 - (C) The transformers must have same voltage ratio to avoid no load circulating current.
 - (D) There should exist only a limited disparity in the per unit impedances of the transformers.
98. A 20 kVA, 50 Hz, 2000/200V distribution transformer has primary turns of 200. The maximum flux in the core is given by _____ webers.
- (A) 0.09
 - (B) 0.045
 - (C) 0.0225
 - (D) 0.2
99. Which of the following cooling methods is used for very large size transformers?
- (A) Natural cooling
 - (B) Oil to air heat exchanger unit
 - (C) Oil to water heat exchanger unit
 - (D) None of the above
100. The fusing characteristic is a curve between
- (A) Fusing time and voltage.
 - (B) Fusing time and percentage of fuse current.
 - (C) Fusing time and Temperature.
 - (D) Fusing time and material type.
- _____

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SPACE FOR ROUGH WORK