

008/2022

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 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. 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.

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1. The unit of solid angle is :
(A) radian (B) steradian
(C) degree (D) none of the above
2. What is the temperature co-efficient value of aluminium at 20° celcius ?
(A) 40.3×10^{-4} (B) 40.3×10^{-3} (C) 40.3×10^{-2} (D) 40.3×10^{-5}
3. Melting point of copper is :
(A) 1083°C (B) 1183°C (C) 983°C (D) 1000°C
4. One ampere-hour is equal to :
(A) 36000 coulombs (B) 3600 coulombs
(C) 360 coulombs (D) 36 coulombs
5. The shape of warning sign is _____.
(A) circular (B) square (C) triangular (D) rectangular
6. Unit of M.M.F. is :
(A) Maxwell (B) Lambda (C) Joule (D) Ampere turns
7. What is the permeability of bismuth ?
(A) 0.00099988 (B) 0.99988 (C) 1.000999881 (D) 1.99988
8. The lifting power of a magnet is :
(A) $B^2A/2\mu_0$ (B) $A^2B/2\mu_0$ (C) $B^2A/4\mu_0$ (D) $A^2B/4\mu_0$
9. Which type of capacitors are used in RF coupling circuits ?
(A) tantalum (B) electrolytic
(C) monolithic (D) metalized polypropylene
10. The voltage of a simple voltaic cell is :
(A) 1.5 V (B) 1.28 V (C) 1.08 V (D) 1.4 V

A

3

{P.T.O.}

11. The speed of electricity is :
(A) 2,97,842 km/s (B) 2,97,842 km/m
(C) 2,97,842 km/hr (D) none of the above
12. What is the resistance of the inductive coil takes 5 A current across 240 V, 50 Hz supply at 0.8 P.F. ?
(A) 48 W (B) 42.5 W (C) 38.4 W (D) 26.6 W
13. In a 3 phase system, if the active power is 4 kW and the apparent power is 5 kVA, calculate the reactive power.
(A) 1 kVAR (B) 2 kVAR (C) 3 kVAR (D) 4 kVAR
14. What is the di-electric strength in k.V/m.m. of asbestos at 20°C ?
(A) 40 (B) 42 (C) 44 (D) 46
15. Two wattmeter method is used to measure the power in _____ load.
(A) resistive load (B) balanced load
(C) un-balanced load (D) balanced and un-balanced load
16. To magnetize a steel is difficult because of its :
(A) high density (B) high retentivity
(C) high permeability (D) low permeability
17. What is the effect if one cell is connected with reverse polarity in a parallel combination circuit ?
(A) voltage became zero (B) became open circuit
(C) will get short circuited (D) no effect will function normally
18. The depolarizer is used in dry cell is :
(A) MNO_2 (B) MNO_3
(C) mercury sulphate (D) NH_3
19. Two batteries each of open circuit voltage 2 V and internal resistance of 2 ohm are connected in parallel to supply a load of 2 ohm the current supplied by the battery is :
(A) 0.33 A (B) 2 A (C) 0.8 A (D) 1 A
20. A 24 ohm and 8 ohm resistors are in parallel have a combined resistance of :
(A) 32 ohm (B) 24 ohm (C) 12 ohm (D) 6 ohm

21. The control force employed in an indicating instrument, which can be kept in any position is :
- (A) gravity control (B) eddy current control
(C) fluid friction control (D) spring control
22. If the meter constant mentioned in the meter is 1500 revolution/k.W.H., in one revolution, the energy consumption is :
- (A) 40 watt-minutes (B) 60 watt-minutes
(C) 100 watt-minutes (D) 50 watt-minutes
23. Maxwell-Wein bridge is used for measuring :
- (A) capacitance (B) dielectric loss (C) inductance (D) phase angle
24. The line voltage of a delta-connected three-phase circuit is 415 V. The phase voltage is :
- (A) 220 V (B) 230 V (C) 240 V (D) 415 V
25. In a 3 phase star connected resistive load the resistance of each phase is 50 ohm if one of the resistances is removed and 200 V supply is given the absorbed power will be :
- (A) 200 W (B) 400 W (C) 800 W (D) 600 W
26. In Flemings left hand rule, forefinger indicates :
- (A) Direction of supply of voltage (B) Motion of the conductor
(C) Direction of field (D) Direction of current flow
27. A current transformer step up :
- (A) Voltage (B) Current (C) Power (D) Frequency
28. Hunting occurs in :
- (A) Transformer (B) Induction motor
(C) Synchronous motor (D) D.C. motor
29. The system earthing is done at :
- (A) Domestic wiring (B) Godown wiring
(C) Generating station (D) House wiring

30. An example of cold cathode lamp is :
(A) Neon lamp (B) Mercury vapour lamp
(C) Fluorescent tube (D) Incandescent lamp
31. Decimal equivalent of Hexadecimal number 'D' is :
(A) 14 (B) 13 (C) 12 (D) 10
32. Terminals of a IGBT are :
(A) Base, Collector, Emitter (B) Emitter, Collector, Gate
(C) Base 1, Base 2, Emitter (D) Drain, Source, Gate
33. The capacity of Transformers are rated by its :
(A) True power (B) Actual power
(C) Apparent power (D) Reactive power
34. Which circuits quick response type diazed fuses are used ?
(A) Motor circuits (B) Heating circuits
(C) Lightning circuits (D) Electronics circuits
35. How many number of brushes are used in wave wound DC shunt generator ?
(A) 1 (B) 2 (C) 3 (D) 6
36. A JFET is a _____ driven device.
(A) Voltage (B) Current (C) Frequency (D) Power
37. The radix of decimal number system is :
(A) 1 (B) 2 (C) 10 (D) 0
38. As per BIS the shunt field winding terminals of a DC machine is marked :
(A) B1 & B2 (B) E1 & E2 (C) F1 & F2 (D) D1 & D2
39. The V-curve of a synchronous motor is the relation between :
(A) Applied voltage and back emf (B) Back emf and armature current
(C) Back emf and power factor (D) Armature current & rotor field current

40. Which transformer **does not** step up or step down the voltage ?
(A) Auto transformer (B) Isolation transformer
(C) Power transformer (D) Current transformer
41. Binary value of 0101 is equivalent to decimal number :
(A) 5 (B) 7 (C) 4 (D) 3
42. An SCR has _____ semiconductor layers.
(A) 1 (B) 2 (C) 4 (D) 3
43. Ripple frequency of full wave bridge rectifier is :
(A) F input (B) 2 F input (C) 4 F input (D) $\frac{1}{2}$ F input
44. Which method of speed control is used to obtain above normal speed in DC series motor ?
(A) Field tapping method (B) Voltage control method
(C) Field diverter method (D) Armature control method
45. Which one is a Universal gate ?
(A) OR (B) NOR (C) NOT (D) AND
46. A UJT contains _____ PN junctions.
(A) 1 (B) 2 (C) 3 (D) 4
47. The insulation resistance of a DC motor is measured in :
(A) Mega volts (B) Mega watts (C) Mega ohms (D) Kilo ohms
48. Which test is used to check whether the switches are connected in live wire or not ?
(A) Continuity test (B) Open circuit test
(C) Ground test (D) Polarity test
49. Which electrical accessories is used for taking supply from a lamp holder ?
(A) Ceiling rose (B) 3 pin plug top
(C) Adaptor (D) Two pin plug top
50. An example of inverter gate is :
(A) NAND (B) OR (C) NOT (D) AND

51. What is the purpose of soldering on sheet metal joint ?
(A) To avoid bend (B) To avoid crack
(C) To avoid leak (D) To make strengthless
52. Which part in the internal gear pump act as seal ?
(A) Gears (B) Gasket
(C) Sealing ring (D) Crescent shaped spacer
53. Which rivet used in heavy structural work ?
(A) Pan head rivet (B) Snap head rivet
(C) Counter sunk rivet (D) Conical head rivet
54. Which washers are commonly used for structural fabrication work ?
(A) Flat washers (B) Punched washers
(C) Tab washer (D) Toothed lock washer
55. Which metal is very soft and heavy in sheet metal work ?
(A) Lead (B) Black iron (C) Aluminium (D) Copper sheet
56. Which hammer is suitable for riveting ?
(A) Plastic hammer (B) Ball pein hammer
(C) Cross pein hammer (D) Straight pein hammer
57. Which key is used for easy fixing and removing ?
(A) Feather key (B) Gib-head key
(C) Hollow saddle key (D) Circular taper key
58. Which type of nut required aligning the axle shaft hole and slot of the nut for locking ?
(A) Castle nut (B) Chuck nut
(C) Thumb nut (D) Self lock nut
59. Which energy is converted in hydraulic pump ?
(A) Thermal energy to hydraulic energy
(B) Electrical energy to hydraulic energy
(C) Pneumatic energy to hydraulic energy
(D) Mechanical energy to hydraulic energy

60. Which type of filter helps to protect the pump from fluid contaminations ?
(A) Suction filter (B) Magnetic filter
(C) Absorbent filter (D) Mechanical filter
61. Which of the following is an insulator ?
(A) Copper (B) Aluminium (C) Silver (D) PVC
62. Which is a good conductor ?
(A) Silver (B) Iron (C) Steel (D) Aluminium
63. Which law states that "The current is directly proportional to the voltage and inversely proportional to the resistance" ?
(A) Ohm's law (B) Hook's law (C) Boyle's law (D) Newton's law
64. What is the material of negative plate in the lead acid battery ?
(A) Antimony (B) Tin (C) Spongy lead (D) Lead peroxide
65. Which instrument is prohibited to connect with live wire ?
(A) Ammeter (B) Voltmeter (C) Ohm meter (D) Watt meter
66. Which measuring instrument used to measure the ampere, volt and resistance ?
(A) Watt meter (B) Energy meter (C) Galvano meter (D) Multi meter
67. What is the unit of potential difference ?
(A) Watt (B) Ampere (C) Ohm (D) Volts
68. What is the advantage of free maintenance sealed battery ?
(A) No need for check and top up distilled water
(B) No need for recharging the battery
(C) No chance of sulphation of battery terminals
(D) No need of disconnect the terminals to remove battery
69. Which is a temperature sensitive resistor ?
(A) Diode (B) Thyristor (C) Thermistor (D) Transistor

70. Which circuit the ballast resistor is used ?
(A) Horn circuit (B) Wiper circuit
(C) Flasher circuit (D) Headlamp circuit
71. Which of the following is **true** about the thermodynamic cycle of a diesel engine ?
(A) Constant volume cycle (B) Constant pressure cycle
(C) Atkinson cycle (D) None of these
72. What is the range of compression pressure of a typical petrol engine ?
(A) 90 to 150 PSI (B) 400 to 550 PSI (C) 500 to 700 PSI (D) None of these
73. Which of the following is false about engine cooling system ?
(A) Radiator pressure cap consists of a pressure valve which opens up when the pressure exceeds a pre-set value.
(B) Vacuum valve on radiator pressure cap opens up to let the coolant in while the engine cools down.
(C) ECM calculates coolant temperature value from the ECT sensor output.
(D) Engine overheats if the thermostat valve is stuck open.
74. In which of the following types of oil pumps does not use eccentric shafts or cams ?
(A) External gear type pump (B) Rotor type pump
(C) Vane type pump (D) Plunger type pump
75. Which of the following statements is **false** about lubrication system ?
(A) Oil cooler heats the oil when coolant temperature is greater than oil temperature.
(B) All the oil reaching main oil gallery is filtered in Bypass oil filter system.
(C) Dry sump lubrication system uses a separate tank to store oil.
(D) Lubricant also helps in preventing blow by gases entering crankcase.
76. Which of the following is **false** about fuel system ?
(A) Air locking in the diesel fuel system will cause erratic running of engine.
(B) Water in fuel system might damage fuel injectors.
(C) An engine can be started without the signal from Crank position sensor (CKP) input.
(D) Injection pressure in CRDi engines vary from 200 to 2000 bars.

77. Which of the following type of pump needs more frequent overhaul frequency than others under similar operating conditions ?
- (A) Submersible pump
 - (B) Vertical turbine pump
 - (C) Centrifugal pumps
 - (D) All of these pumps have broadly the same maintenance frequency
78. Which of the following is **true** about the Submersible pumps ?
- (A) Single stage pumps are preferred over Multistage pumps in water wells and oil wells
 - (B) They are centrifugal pumps operating in a vertical position
 - (C) The energy conversion taking place at the pump diffuser is kinetic energy into pressure energy
 - (D) All are true
79. Which of the following is **false** about Jet pumps ?
- (A) It has no reciprocating parts
 - (B) The motor and pump cannot be offset from the well
 - (C) Suction pipe is connected to the nozzle chamber
 - (D) All are false
80. Which of the following is **wrong** ?
- (A) A locked pump shaft will result in blown pump fuse
 - (B) Clogged strainer will result in reduced pump capacity
 - (C) A leaking valve will cause rapid wear and tear on parts
 - (D) Faulty pressure switch will result in pump not starting up
81. Crowning of pulleys are done for :
- (A) Better belt life
 - (B) Lesser chance of belt running off
 - (C) Less belt slips
 - (D) None of these
82. Which of the following is **not true** about induction motors ?
- (A) Rotor of the induction motor cannot run at synchronous speed
 - (B) Motor r.p.m. increases with frequency of input supply
 - (C) Low rotor resistance means high starting torque
 - (D) Direction of rotation of an induction motor can be changed by any two swapping phase leads

83. Which type of valve is used for very fine control of fluid flow ?
(A) Butterfly valve (B) Angle valve (C) Ball valve (D) Needle valve
84. Which of the following starters are used for starting a squirrel cage motor ?
(A) Star-delta starter (B) Auto-transformer starter
(C) Step-down transformer (D) All of these
85. Which of the following is **false** about D.O.L starters ?
(A) No-volt coil disconnects supply to the motor when the supply voltage is lower
(B) A thermal overload relay is provided to protect the motor
(C) Can be used without backup fuses
(D) Due to heavy starting current, their usage is limited beyond a certain motor capacity
86. Which of the following are the features of an ELCB, MCB Circuit breaker ?
(A) Over current (B) Short circuit (C) Earth leakage (D) All of these
87. What is cut-off factor of a fuse ?
(A) The current at which the fuse element melts
(B) Ratio between minimum fusing current and current rating
(C) The voltage at which fuse element melts
(D) Time taken by a fuse to interrupt the circuit in the event of a fault
88. To what limit of current beyond which Re-wirable fuses are not usually preferred ?
(A) 200 A (B) 350 A (C) 500 A (D) 1250 A
89. Which of the following relays designed to operate when current falls below a predetermined value ?
(A) Electromagnetic relay (B) Current sensing relay
(C) Under-current relay (D) Latching relays
90. Which of the following is **not** a reason of motor running hot ?
(A) Open circuit winding (B) Short circuited capacitor
(C) Defective capacitor (D) Blown fuse

91. Inside which of the following hydraulic pumps a crescent shaped spacing can be found ?
- (A) External gear pump (B) Internal gear pump
(C) Vane type pump (D) Lobe pump
92. Which of the following is **true** about temperature sensors ?
- (A) Its electrical resistance increases with increase in temperature
(B) Its electrical resistance decreases with increase in temperature
(C) It could be fitted with a balancing coil gauge
(D) Its electrical resistance remains unchanged irrespective of temperature changes
93. Which of the following components serves the purpose of retaining the piston down against the seat in balanced condition in a pressure relief valve ?
- (A) Heavy spring (B) Poppet
(C) Adjusting screw (D) Light spring
94. Which of the following is a dependant factor on fluid flow rate of a variable flow control valve ?
- (A) Pressure difference (B) The size of throttle gap
(C) Viscosity of oil (D) All of these
95. Which of the following is **not true** about pneumatic systems ?
- (A) FRL assembly also add small quantities of oil into the compressed air systems
(B) The expansion of PRV is Pressure Return Valve
(C) Pressure switch can restart the compressor motor when the pressure drops below a pre-set value
(D) Spool valve is a type of slide valve
96. Which of the following is **false** about Orifices ?
- (A) An orifice is the simplest method for controlling fluid flow
(B) The orifice is always connected in parallel with the pump
(C) Variable orifice is a calibrated needle valve
(D) Orifices create a pressure drop

97. Which of the following is **not** associated with hydraulic actuator speed control ?

- (A) Meter in speed control
- (B) Meter out speed control
- (C) Bleed off speed control
- (D) Bleed out speed control

98. Which one of the following terms is associated with positive displacement pumps ?

- (A) Volute casing
- (B) Semi open impeller
- (C) Turbine pump
- (D) Screw rotors

99. Which of the following is **not** related with pipe joints ?

- (A) Eccentric reducer
- (B) Concentric reducer
- (C) Short nipple
- (D) Flanged bush

100. Which of the following is **not true** about pumps ?

- (A) Rotary pumps don't need to be primed
- (B) Increase in fluid temperature causes cavitation
- (C) Foot valves are non-return valves
- (D) Self priming devices are connected between discharge pipe and pump

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