

65/2026

Question Booklet
Alpha Code

A

Question Booklet
Serial Number:

Total Number of Questions : 100

Time : 1 Hour 30 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/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 1/3rd 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

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6. The pressure distribution in a plane source flow can be obtained with the help of
- (A) Continuity Equation
 - (B) Euler's Equation
 - (C) Bernoulli's Equation
 - (D) Darcy-Weisbach Equation
7. Which of the following devices is not used for measuring rate of flow in pipeline?
- (A) Venturimeter
 - (B) Orifice meter
 - (C) Rotameter
 - (D) Pitot tube
8. The cross-sectional area of the jet at the vena contracta is
- (A) More than that at the orifice
 - (B) Less than that of the orifice
 - (C) Equal to that of the orifice
 - (D) None of the above
9. For a suppressed weir,
- (A) The crest length is equal to the width of channel
 - (B) The crest length is more than the width of channel
 - (C) The crest length is less than the width of channel
 - (D) None of the above
10. In the phenomenon of cavitation, the characteristic fluid property involved is
- (A) Surface tension
 - (B) Viscosity
 - (C) Bulk modulus of elasticity
 - (D) Vapour pressure

11. When a flat plate moving with velocity ' u ' held normal to the fluid jet of velocity ' V ', the component of the leaving jet normal to the plane will be
- (A) $V - u$ (B) V
(C) 0 (D) u
12. In a hydraulic power plant for a reaction turbine, the net head is the difference between
- (A) (i) Sum of the pressure head, velocity head and the elevation of the centre of the penstock above the assumed datum at the entrance of the turbine and (ii) Velocity head in the draft tube at its exit
- (B) (i) Sum of the pressure head, velocity head and the elevation of the centre of the penstock above the assumed datum at the entrance of the turbine and (ii) The elevation of the tail water plus the velocity head in the draft tube at its exit
- (C) (i) Sum of the pressure head and the elevation of the centre of the penstock above the assumed datum at the entrance of the turbine and (ii) Velocity head in the draft tube at its exit
- (D) (i) Sum of the pressure head and the elevation of the centre of the penstock above the assumed datum at the entrance of the turbine and (ii) The elevation of the tail water plus the velocity head in the draft tube at its exit
13. In a hydraulic turbine, the ratio of power developed by the runner to the net power supplied by the water at the entrance to the turbine is
- (A) Hydraulic efficiency
(B) Mechanical efficiency
(C) Volumetric efficiency
(D) Overall efficiency
14. Specific speed between 260 to 860 that indicates the hydraulic turbine is
- (A) Pelton wheel
(B) Francis turbine
(C) Kaplan turbine
(D) Turbo wheel

15. In a Francis turbine, the value of speed ratio varies between
- (A) 0.10 to 0.15
 - (B) 0.15 to 0.30
 - (C) 0.6 to 0.9
 - (D) None of these
16. Run away speed for a Kaplan turbine normally ranges from
- (A) 1.8 to 1.9 times normal speed
 - (B) 2 to 2.2 times normal speed
 - (C) 2.5 to 3 times normal speed
 - (D) 3.5 to 5 times normal speed
17. Constant head characteristics of Kaplan turbine for different gate openings shows
- (A) Unit discharge decrease with unit speed
 - (B) Unit discharge increase with unit speed
 - (C) Unit discharge does not vary with unit speed
 - (D) Unit discharge first increase and then decrease with unit speed
18. A hydraulic turbine has an output of 6500 kW when it works under a head of 25 m and runs at 100 rpm. Specific speed of the turbine is
- (A) 86.25
 - (B) 144.22
 - (C) 250.36
 - (D) 365.28
19. Favourable conditions for negative slip in a reciprocating pump are
- (A) High speed, short suction pipe, low delivery head
 - (B) Low speed, short suction pipe, low delivery head
 - (C) High speed, long suction pipe, low delivery head
 - (D) High speed, long suction pipe, high delivery head

20. In a centrifugal pump, the ratio of output of the pump to the power imparted by the impeller is called
- (A) Manometric efficiency
 - (B) Volumetric efficiency
 - (C) Mechanical efficiency
 - (D) Overall efficiency
21. The heating and expanding of a gas is called
- (A) Thermodynamic system
 - (B) Thermodynamic cycle
 - (C) Thermodynamic process
 - (D) Thermodynamic law
22. In a Carnot cycle, the process carried at extremely high speed is
- (A) Isothermal expansion
 - (B) Adiabatic expansion
 - (C) Isothermal compression
 - (D) All of the above
23. Which one of the following pairs best expresses a relationship similar to that expressed in the pair 'pressure-volume' for a thermodynamic system undergoing a process?
- (A) Enthalpy-entropy
 - (B) Pressure-entropy
 - (C) Pressure-temperature
 - (D) Temperature-entropy
24. The law which indicates the limit of converting heat into work is
- (A) First law of thermodynamics
 - (B) Second law of thermodynamics
 - (C) Third law of thermodynamics
 - (D) Zeroth law of thermodynamics

25. The maximum possible number of specific heats that a perfect gas could have is
- (A) 2 (B) 3
(C) 4 (D) Infinity
26. In an extensive property of a thermodynamic system,
- (A) Extensive heat is transferred
(B) Extensive work is done
(C) Extensive energy is utilized
(D) None of the above
27. In an irreversible process, there is a
- (A) Loss of heat
(B) No loss of heat
(C) Gain of heat
(D) No gain of heat
28. The work output of theoretical Otto cycle
- (A) Increases with increase in compression ratio
(B) Increases with increase in pressure ratio
(C) Increases with increase in adiabatic index
(D) All of the above
29. The property of a working substance, which increases or decreases according to the heat supplied or removed in a reversible manner is called
- (A) Enthalpy
(B) Entropy
(C) Internal energy
(D) None of these

30. The efficiency of diesel cycle approaches Otto cycle efficiency with
- (A) Increase in cut-off
 - (B) Decrease in cut-off
 - (C) Zero cut-off
 - (D) Constant cut-off
31. Calorific value of solid fuel is expressed in terms of
- (A) KJ/Kg
 - (B) J/Kg
 - (C) Kg/°C
 - (D) KN/Kg
32. Which instrument is used for finding higher calorific value of solid and liquid fuels?
- (A) Boy's gas calorimeter
 - (B) Bomb calorimeter
 - (C) Junker's calorimeter
 - (D) Separating calorimeter
33. A fuel consists of 85% carbon, 12.5% hydrogen, 2.5% residual matter by mass. What is the higher calorific value of fuel?
- (A) 4673 KJ/Kg
 - (B) 46730 KJ/Kg
 - (C) 4673 KJ/Kg
 - (D) 4673000 J/Grm
34. The dryness fraction of dry steam is
- (A) Less than one
 - (B) Greater than one
 - (C) One
 - (D) None of the above

35. Which steam cycle comprises two isobaric and two isentropic?
- (A) Carnot cycle
 - (B) Regenerative cycle
 - (C) Rankine cycle
 - (D) Otto cycle
36. In which steam turbine, the steam is expanded in nozzles only and there is a pressure drop and heat drop?
- (A) De-laval turbine
 - (B) Parson's turbine
 - (C) Impulse turbine
 - (D) Kaplan turbine
37. A closed-cycle gas turbine works on
- (A) Joule cycle
 - (B) Ericsson cycle
 - (C) Carnot cycle
 - (D) Rankin cycle
38. In a tandem type compound steam engine, the high pressure and low pressure cylinder
- (A) Is set at 90°
 - (B) Have a separate piston rod
 - (C) Have a common piston rod
 - (D) Is set in V arrangement
39. If the nozzle coefficient is 'K' and enthalpy drop during expansion is ' h_d ', then velocity of steam leaving the nozzle 'V' is
- (A) $44.72 h_d \sqrt{K}$
 - (B) $44.72 K h_d$
 - (C) $44.72 K \sqrt{h_d}$
 - (D) $44.72 \sqrt{K} h_d$

40. The compounding of turbine is done in order to
- (A) Improve efficiency
 - (B) Reduce exit loss
 - (C) Reduce speed of rotor
 - (D) All of the above
41. The centre of gravity of a uniform semicircular lamina lies at a distance of _____ from its base when measured along its vertical radius.
- (A) r
 - (B) $\frac{4r}{3\pi}$
 - (C) $\frac{r}{3}$
 - (D) $\frac{r}{2}$
42. In the stress-strain curve of a ductile material, the Hooke's law is valid at
- (A) Necking region
 - (B) Elastic region
 - (C) Rupture point
 - (D) None of the above
43. The deformation of a bar of uniform cross-sectional area A and length L when subjected to an axial tensile load P is
- (A) $\frac{P}{LAE}$
 - (B) $\frac{PE}{AL}$
 - (C) $\frac{PL}{AE}$
 - (D) $\frac{AL}{PE}$
44. In a composite section subjected to tensile load,
- (A) The load carried by the individual sections is same as external load
 - (B) Extension of individual sections are different
 - (C) Deformations of individual sections are equal
 - (D) None of the above

45. If a simply supported beam carries a point load at the centre of the beam, then the bending moment diagram will be a
- (A) Parabola with maximum ordinate at the centre of the beam
 - (B) Parabola with maximum ordinate at one end of the beam
 - (C) Triangle with maximum ordinate at the centre of the beam
 - (D) None of the above
46. The ratio of the moment of inertia about the neutral axis to the distance to the extreme point of the section from the neutral axis is called
- (A) Polar moment of inertia
 - (B) Section modulus
 - (C) Modulus of rigidity
 - (D) Centroid
47. Torsional rigidity of a shaft is defined as the torque required to produce
- (A) Maximum twist in the shaft
 - (B) Maximum shear stress in the shaft
 - (C) Minimum twist in the shaft
 - (D) A twist of one radian per unit length of the shaft
48. The circumferential stress in a thin cylindrical shell of diameter d , length L and thickness t when subjected to an internal pressure p is equal to
- (A) $\frac{pd}{4t}$
 - (B) $\frac{pd}{2t}$
 - (C) $\frac{pd}{t}$
 - (D) $\frac{pd}{lt}$
49. The crippling load according to Euler's theory for long columns when both ends of the column hinged is equal to
- (A) $\frac{4\pi^2 EI}{l^2}$
 - (B) $\frac{\pi^2 EI}{l^2}$
 - (C) $\frac{\pi^2 EI}{2l^2}$
 - (D) $\frac{\pi^2 EI}{4l^2}$

50. The ratio of lateral strain to longitudinal strain is termed as
- (A) Poisson's ratio
 - (B) Bulk modulus
 - (C) Modulus of rigidity
 - (D) Modulus of elasticity
51. All iron and steel products are derived originally from
- (A) Pig iron
 - (B) Cast iron
 - (C) Wrought iron
 - (D) White cast iron
52. Rimmed steel is represented by the symbol
- (A) K
 - (B) Q
 - (C) R
 - (D) S
53. Normalizing produces a homogeneous structure consisting of only pearlite for
- (A) Hypoeutectoid steel
 - (B) Eutectoid steel
 - (C) Hypereutectoid steel
 - (D) Alloy steel
54. Interrupted quenching operation produces
- (A) Austenite
 - (B) Bainite
 - (C) Martensite
 - (D) All of the above

55. NIMONICS is an alloy of
- (A) Zinc (B) Copper
(C) Copper, Tin and Antimony (D) Nickel
56. Identify surface hardening process from the following.
- (A) Process annealing
(B) Isothermal quenching
(C) Normalizing
(D) Nitriding
57. Identify Chromium, Tungsten and Vanadium content in 18-4-1 HSS.
- (A) 1%, 18%, 4% (B) 1%, 4%, 18%
(C) 18%, 4%, 1% (D) 4%, 18%, 1%
58. The melting point of pure iron is
- (A) 1535 °C (B) 1400 °C
(C) 910 °C (D) 768 °C
59. Steel is an alloy of iron and carbon with carbon content varying up to
- (A) 0.5% (B) 1%
(C) 1.5% (D) 2%
60. Alloying element suitable to improve corrosion resistance is
- (A) Chromium (B) Boron
(C) Molybdenum (D) Silicon
61. What is Tenoning?
- (A) Tenoning is a production of blind holes
(B) Tenoning is the recess along a workpiece
(C) Tenoning is a wood finishing operation
(D) Tenoning is the projection on a wood piece to fit inside a mortise

62. What is the use of riddle?
- (A) It is used for mixing the moulding sand
 - (B) It is used for holding the cope and drag
 - (C) It is used to remove small metals and foreign materials
 - (D) It is used for separating cope and drag
63. In sheet metal section, sheet means
- (A) Less than 6 mm
 - (B) Less than 10 mm
 - (C) Less than 2 mm
 - (D) Less than 20 mm
64. The function of rectifier in Welding is
- (A) Reducing voltage
 - (B) Converting AC to DC
 - (C) Reducing ampere
 - (D) Converting DC to AC
65. The material of the double cut file is
- (A) High carbon steel
 - (B) High speed steel
 - (C) Low carbon steel
 - (D) Cast iron
66. Taylor's tool life equation is
- (A) $VT^n = C$
 - (B) $V * T = Cn$
 - (C) $V/T = Cn$
 - (D) $T/V = C$
67. Cutting speed equation of a milling cutter is
- (A) $V = \pi DN/1000$ m/sec
 - (B) $V = \pi DN/1000$ mm/min
 - (C) $V = \pi D/N \times 1000$ m/min
 - (D) $V = \pi DN/1000$ m/min

68. In lathe, the pitch of a leadscrew is 4 mm and the pitch of the thread to be cut 2 mm. Find change gear ratio.
- (A) $1/3$ (B) $1/2$
(C) $1/4$ (D) $1/6$
69. Which of the following correctly defines the function of planer?
- (A) The tool moving across the work
(B) The tool moving on the work in horizontal direction
(C) The work is supported on the table and tool is stationary
(D) The tool moving in rotational direction clockwise and anticlockwise
70. What is the twist drill cutting angle for general work?
- (A) 116 degree (B) 118 degree
(C) 110 degree (D) 90 degree
71. Which of the following statements is/are correct about a point that is situated in the third quadrant?
- (i) The top view is always above reference line
(ii) Front view is always above the reference line
(iii) Distance of front view from reference line is equal to the distance of the point from the horizontal plane
- (A) Only (i and ii) (B) Only (ii and iii)
(C) Only (i and iii) (D) All of the above (i, ii and iii)
72. A hyperbola has
- (A) One focus and one directrix
(B) Two foci and two directrices
(C) Two foci and one directrix
(D) None of the above

73. Which of the following statements is/are correct about isometric projection?
- (i) In isometric projection, the three mutually perpendicular axes (isometric axes) of the cube containing the object are equally inclined to vertical plane
 - (ii) All vertical lines of the object are represented by vertical lines in the isometric projection
 - (iii) In isometric projection, a square is represented by a rhombus
- (A) Only (i and ii) (B) Only (ii and iii)
(C) Only (i and iii) (D) All of the above (i, ii and iii)
74. The method of development of surfaces are used for pyramids and cones.
- (A) Parallel-line development
 - (B) Triangulation development
 - (C) Radial-line development
 - (D) Approximate method
75. Which of the following statements is/are correct about oblique projection?
- (i) Projectors from an object are parallel to each other and inclined to the plane of projection.
 - (ii) All the faces of the object are distorted in the shape and size
 - (iii) The faces of the object which are perpendicular to the plane of projection will be distorted in the shape and size
- (A) Only (i and iii) (B) Only (ii and iii)
(C) Only (i and ii) (D) All of the above (i, ii and iii)
76. In general, which of the following assumptions is/are correct about the analysis of a riveted joint?
- (i) There are no bending or direct stresses in rivets.
 - (ii) Rivet holes in the plate do not weaken the plate in compression.
 - (iii) Rivets after assembly completely fill the holes.
- (A) Only (ii and iii)
(B) Only (i and ii)
(C) All of the above (i, ii and iii)
(D) Only (i and iii)

77. In longitudinal fillet-welded joint, the mode of failure is due to
- (A) Shear (B) Tensile force
(C) Compressive force (D) Eccentric load
78. In a belt drive, the ratio of the tangential force to twice the initial tension is called the
- (A) Slip factor
(B) Transmission efficiency
(C) Pull factor
(D) Service factor
79. Which of the following basic requirements is/are must be considered while designing a gear drive?
- (i) The dynamic load at normal running conditions due to profile error on the tooth
(ii) The highest static load acting on the gear tooth due to high starting torque
(iii) Wear characteristics of the gear tooth for a long satisfactory life
- (A) Only (i and ii)
(B) Only (ii and iii)
(C) All of the above (i, ii and iii)
(D) Only (i and iii)
80. The Woodruff key is used to transmit
- (A) High values of torque
(B) Heavy duty load
(C) Tangential force
(D) Small values of torque
81. Ignition lag in SI engines is reduced, if
- (A) Initial temperature is decreased
(B) Initial pressure is decreased
(C) Initial temperature is increased
(D) Initial temperature and pressure are decreased

82. Detonation can be controlled by
- (A) Decreasing engine r.p.m
 - (B) Retarding spark
 - (C) Advancing spark
 - (D) Use of low octane fuel
83. Too high pressure in diesel injectors is due to
- (A) Spring rate too low
 - (B) Scoring or pitting on needle seat
 - (C) Needle valve seized in almost closed position
 - (D) Spring broken
84. Lower delay period is obtained by
- (A) Use of higher cetane number fuel
 - (B) Using lower cetane fuel
 - (C) Higher self-ignition temperature fuel
 - (D) Decrease in injection pressure
85. The best economy fuel-air ratio is
- (A) Increase with engine speed
 - (B) Decrease with engine speed
 - (C) Proportional to engine speed
 - (D) Independent of engine speed
86. Which of the following is not an accessory in steam boilers?
- (A) Economizer
 - (B) Superheater
 - (C) Feed pump
 - (D) Heating surface

- 87. Identify the high pressure water tube steam boiler working on forced circulation.**
- (A) LaMont Boilers**
 - (B) Cochran Boilers**
 - (C) Babcock and Wilcox Boiler**
 - (D) Scotch Marine Boilers**
- 88. The device used to control the flow of steam from the boiler to the main stream pipe is**
- (A) Blow off cock**
 - (B) Steam stop valve**
 - (C) Feed check valve**
 - (D) Spring loaded safety valve**
- 89. Name the device used for preheating the feed water by utilizing the heat of waste flue gases.**
- (A) Economizer**
 - (B) Superheater**
 - (C) Feed pipe**
 - (D) Anti-priming pipe**
- 90. Which of the following statements is not true in Water-tube boilers?**
- (A) The working pressure is high**
 - (B) The rate of steam generation and quality of steam is better**
 - (C) Direction of water circulation is well defined**
 - (D) The hot flue gases pass through tubes and water surrounds them**
- 91. In lithium bromide vapor absorption system, the refrigerant and absorbent respectively are**
- (A) Water, lithium bromide**
 - (B) Lithium bromide, water**
 - (C) Ammonia, lithium bromide**
 - (D) Lithium bromide, ammonia**

92. Wet bulb temperature at 100% relative humidity is
- (A) More than dew point temperature
 - (B) Same as dew point temperature
 - (C) Less than ambient temperature
 - (D) More than ambient temperature
93. In SI unit, one tonne of refrigeration is equal to
- (A) 210 kW
 - (B) 3.5 kW
 - (C) 112 kW
 - (D) 335 kW
94. Newton's law of cooling is related with
- (A) Conductive heat transfer
 - (B) Convective heat transfer
 - (C) Radiation heat transfer
 - (D) All of the above
95. When the temperature of water in spray washing system is much higher than the temperature of the dry bulb temperature of the air entering the system, the process that takes place is
- (A) Heating and humidification
 - (B) Sensible heating
 - (C) Humidification
 - (D) Heating and dehumidification
96. Thermal conductivity of a conducting material depends on its
- (A) Length
 - (B) Thickness
 - (C) Diameter
 - (D) Composition

97. For a perfect black body,
- (A) absorptivity = 1, reflectivity = 0, transmissivity = 1
 - (B) absorptivity = 0, reflectivity = 1, transmissivity = 0
 - (C) absorptivity = 1, reflectivity = 0, transmissivity = 0
 - (D) absorptivity = 1, reflectivity = 1, transmissivity = 1
98. Factors affecting comfort air conditioning are
- (A) Temperature of air
 - (B) Humidity of air
 - (C) Motion of air
 - (D) All of the above
99. What will be the ratio of the highest temperature to the lowest temperature of a reversed Carnot cycle, if COP is 2?
- (A) 1
 - (B) 1.5
 - (C) 2
 - (D) 4
100. Calculate the COP of the heat pump, if it operates between the temperature limits of 400 K and 200 K.
- (A) 2
 - (B) 3
 - (C) 4
 - (D) 5
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SPACE FOR ROUGH WORK



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