

45/2023

Question Booklet
Alpha Code

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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 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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DO NOT WRITE HERE

1. The viscosity of liquids decreases with increase in temperature due to
 - (A) Decreased cohesive forces
 - (B) Increased cohesive forces
 - (C) Decreased molecular momentum transfer
 - (D) Increased molecular momentum transfer

2. In Newtonian fluids, the shear stress is
 - (A) directly proportional to the viscosity
 - (B) inversely proportional to the viscosity
 - (C) directly proportional to the deformation rate
 - (D) directly proportional to the shear strain

3. The correct statement is
 - (A) Fire point is higher than the flash point
 - (B) Fire point is lower than the flash point
 - (C) There is no relation between Fire point and the flash point
 - (D) Sometimes Fire point is higher and some time is Flash point

4. In a centrifugal pump the liquid enters the pump
 - (A) at the centre
 - (B) at the top
 - (C) at the bottom
 - (D) from sides

5. The type of flow in which the velocity at any given time does not change with respect to space is called
 - (A) Uniform flow
 - (B) Compressible flow
 - (C) Steady flow
 - (D) Rotational flow

6. A venturimeter is preferred to an orifice plate because
 - (A) It is cheaper
 - (B) It is easy to install
 - (C) Energy loss is less
 - (D) It has very high life

7. Hydraulic radius of a Notch is equal to
 - (A) Area divided by the square of wetted perimeter
 - (B) Area divided by the wetted perimeter
 - (C) Wetted perimeter divided by area
 - (D) Square root of area

8. The unit of Chezy's constant 'C' in the Chezy's formula is
 - (A) m/s
 - (B) m/s²
 - (C) m²/s
 - (D) m^{1/2}/s

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9. Which of the following head loss is significant in a pipe flow?
(A) Loss of head due to gradual contraction
(B) Loss of head due to friction
(C) Loss of head due to sudden enlargement
(D) Loss of head due to sudden contraction
10. Which relation is incorrect?
(A) Pelton Turbine - Impulse Turbine (B) Francis Turbine - Impulse Turbine
(C) Kaplan Turbine - Reaction Turbine (D) Francis Turbine - Reaction Turbine
11. The energy of the isolated system is always a constant, which is given by:
(A) Zeroth law of thermodynamics (B) First law of thermodynamics
(C) Second law of thermodynamics (D) Third law of thermodynamics
12. A series of operations, which takes place in a certain order and restore the initial conditions at the end, is known as
(A) Reversible cycle (B) Irreversible cycle
(C) Thermodynamic cycle (D) None of these
13. The most efficient method of compressing air is to compress it
(A) Adiabatically (B) Isentropically
(C) Isothermally (D) Isochorically
14. 1°C is equal to
(A) 273.15 K (B) 274.15 K
(C) 283.15 K (D) 263.15 K
15. Which of the following devices complies with the Clausius statement of the second law of thermodynamics?
(A) Closed-cycle gas turbine (B) Internal combustion engine
(C) Steam power plant (D) Domestic refrigerator
16. Carnot cycle consists of
(A) Two constant volume & two isentropic processes
(B) Two isothermal and two isentropic processes
(C) Two constant pressure and two isentropic processes
(D) One constant volume, one constant pressure and two isentropic processes
17. The ratio of brake power to indicated power of an I.C. engine is called
(A) Mechanical efficiency (B) Thermal efficiency
(C) Volumetric efficiency (D) Relative efficiency

18. Morse test in Multi-cylinder engines is used to determine
(A) Volumetric efficiency (B) Brake thermal efficiency
(C) Indicated power (D) Brake power
19. Thermal conductivity of copper with rise in temperature
(A) Decreases (B) Increases
(C) Remains constant (D) None of these
20. By which of the following modes of heat transfer, Heat is mainly transferred from an insulated pipe to the surrounding still air?
(A) Conduction (B) Radiation
(C) Forced convection (D) Natural convection
21. A sliding bearing which can support steady loads without any relative motion between the journal and the bearing is called
(A) Zero film bearing (B) Boundary lubricated bearing
(C) Hydro dynamic lubricated bearing (D) Hydrostatic lubricated bearing
22. The piston pin bearings in heavy duty diesel engines are
(A) Needle roller bearing (B) Tapered roller bearing
(C) Collar bearing (D) Cylindrical roller bearing
23. The diameter of the hub of the fly wheel is usually taken as
(A) Equal to the diameter of the shaft
(B) Twice the diameter of the shaft
(C) Three times the diameter of the shaft
(D) Four times the diameter of the shaft
24. A spur gear with pitch circle diameter D has number of teeth T . The module m is
(A) D/T (B) T/D
(C) $\pi D/T$ (D) $D.T$
25. Lewis equation in a spur gear is used to find the
(A) Tensile stress in bending (B) Shear stress
(C) Compressive stress in bending (D) Fatigue stress
26. If Z' is the absolute viscosity of the lubricant in Kg/m-s , N' is the speed of the journal in rpm and p' is bearing pressure in N/mm^2 then the bearing characteristic number is
(A) ZN/p (B) Zp/N
(C) Z/pN (D) pN/Z

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27. The difference between the tooth space and the thickness, as measured along the pitch circle is
(A) Tooth depth (B) Clearance
(C) Backlash (D) Total depth
28. In which property of steel has the ability to resist breaking rather than the ability to absorb energy during deformation?
(A) Machinability (B) Hardness
(C) Toughness (D) Malleability
29. If N' is the speed of the arm and ball about the spindle axle then height of a watt's governor is equal to
(A) $8.95/N^2\text{mts}$ (B) $89.5/N^2\text{mts}$
(C) $895/N^2\text{mts}$ (D) $8950/N^2\text{mts}$
30. A device used to put off fire in the furnace of the boiler when the level of the water in the boiler falls to an unsafe limit is called
(A) Blow off cock (B) Super heater
(C) Fusible plug (D) Economiser
31. Modulus of elasticity is the ratio of
(A) Stress to strain (B) Deformation to original length
(C) Stress to original length (D) Strain to original length
32. The ratio of lateral strain to the linear strain is
(A) Modulus of elasticity (B) Modulus of rigidity
(C) Bulk modulus (D) Poisson's ratio
33. The maximum thermal stress in a circular tapering section is
(A) Directly proportional to the bigger diameter
(B) Directly proportional to the smaller diameter
(C) Inversely proportional to the bigger diameter
(D) Inversely proportional to the smaller diameter
34. The radius of a circle for a shaft of radius (r) rotating a bearing is
(A) $r \cdot \sin \theta$ (B) $r \cdot \cos \theta$
(C) $r \cdot \tan \theta$ (D) $r \cdot \cot \theta$

35. The centre of gravity of an equilateral triangle with each side (a) is _____ from any of the sides.
- (A) $\frac{a \cdot \sqrt{3}}{2}$ (B) $\frac{a \cdot \sqrt{2}}{3}$
 (C) $a/2 \cdot \sqrt{3}$ (D) $a/3 \cdot \sqrt{3}$
36. The moment of inertia of a triangular section base (b) height (h) about an axis passing through its centre of gravity and parallel to the base is given by the relation
- (A) $bh^3/12$ (B) $bh^3/24$
 (C) $bh^3/36$ (D) $bh^3/48$
37. The bending moment of the centre of a simply supported beam carrying a uniformly distributed load is
- (A) wl (B) $wl/2$
 (C) $wl^2/4$ (D) $wl^2/8$
38. If diameter of rivet is (d) safe permissible shear stress for rivet material (T) then shearing value P_s equal to
- (A) $\pi/8 \cdot d^2 \cdot T$ (B) $\pi/4 \cdot d^2 \cdot T$
 (C) $\pi/36 \cdot d^2 \cdot T$ (D) $\pi/16 \cdot d^2 \cdot T$
39. If area of the weld (A) permissible stress in the fillet (σ) then strength of a fillet weld (P) is
- (A) $A \cdot \sigma$ (B) A / σ
 (C) $2A \cdot \sigma$ (D) σ/A
40. The load required to produce a unit deformation in a spring is called
- (A) Torsion of spring (B) Stiffness of spring
 (C) Bending of spring (D) Deflection of spring
41. The two-stroke cycle engine
- (A) One suction valve and one exhaust valve operated by two cams
 (B) Only ports covered and uncovered by piston to effect charging and exhausting
 (C) One suction valve and one exhaust valve operated by one cam
 (D) None of the above
42. In SI. engine, to obtain required firing order
- (A) Battery is installed (B) Ignition Coil is installed
 (C) Distributor is installed (D) Carburettor is installed

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43. In 4-stroke cycle engine power is produced in
(A) Every revolution of the crankshaft
(B) Each stroke
(C) Every alternate revolution of the crankshaft
(D) None of the above
44. Which cross-section do compression rings have?
(A) Triangular cross-section (B) Rectangular cross-section
(C) Circular cross-section (D) Square cross-section
45. The distance between the centres of the front wheel is called
(A) Wheel base (B) Axle width
(C) Turning circle (D) Track
46. The venturi in the carburettor causes the
(A) Increase of air velocity (B) Increase of manifold vacuum
(C) Decrease of air velocity (D) Decrease of fuel flow
47. The turbocharger uses _____ energy
(A) Energy of exhaust gases (B) Engine energy
(C) Energy from a radiator (D) Energy from a flywheel
48. Thermostat valve in the cooling system controls
(A) The flow of water (B) The temperature of water
(C) Both (A) & (B) (D) None of the above
49. In the following system, lubricating oil is carried in separate tanks from where it is fed to the engine.
(A) Wet sump system (B) Mist lubrication system
(C) Splash system (D) Dry sump system
50. Which technology changes the timing of intake/exhaust valves when the engine is running?
(A) DOHC (B) CRDI
(C) VVT (D) TDI
51. The longitudinal members of the chassis is connected by traverse members is known as
(A) Bumpers (B) Cross member
(C) X-Member (D) None of the above

52. Weight of the vehicle produces in the side members of the frame
(A) Vertical Bending (B) Horizontal Bending
(C) Torsion (D) All of these
53. The following type of spring is most commonly used for suspension in heavy vehicle
(A) Coil Spring (B) Quarter elliptic leaf spring
(C) Semi-elliptic leaf spring (D) Torsion spring
54. In circulating ball type steering gear, the balls travel between the ball nut and _____
(A) Worm Wheel (B) Worm Shaft
(C) Gear Rack (D) Steering wheel shaft
55. _____ is the tilting in or out of the front wheels from the vertical when viewed from the front of the vehicle.
(A) Caster (B) Toe-in
(C) King-pin inclination (D) Camber
56. During braking the push rod directly operates
(A) Residual pressure valve (B) Secondary piston
(C) Primary piston (D) Compensating port
57. If a tyre is designated as 175/65 R14 82 S, then the aspect ratio for the tyre is
(A) 82 (B) 175
(C) 65 (D) 14
58. The main function of a master cylinder is to
(A) Ensure that all the wheel brakes are supplied with the same amount of fluid pressure
(B) Convert brake pedal force into hydraulic pressure
(C) Adjust the extent of brake pedal free play
(D) Boost the force applied to brake pedal
59. The parking brake generally acts on
(A) Rear wheels (B) Front wheels
(C) Front and rear wheels (D) Differential
60. The _____ allows for changes in the length of the leaf spring as it bends.
(A) Spring hanger (B) Clamp bolt
(C) Spring centre bolt (D) Shackle

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61. Where is the clutch located?
(A) Between transmission and engine
(B) Between transmission and rear axle
(C) Between transmission and propeller shaft
(D) Between transmission and differential
62. Which of the following is the disadvantage of the cone clutch?
(A) It is silent in operation
(B) It becomes difficult to disengage the clutch when the cone angle is less than 20°
(C) The normal force on the contact surface is larger than the axial force
(D) Same torque can be transmitted for the same size as the plate clutch
63. In which of the gearbox all gears are always in contact?
(A) Constant-mesh gearbox
(B) Sliding mesh gearbox
(C) Synchromesh gearbox
(D) Epicyclical gearbox
64. Which types of joints are used when the shafts are inclined?
(A) Pivot joint
(B) Hinge joint
(C) Ball and socket joint
(D) Universal joint
65. What is the angle between the steering axis and the vertical in the plane of the wheel?
(A) Castor
(B) Camber
(C) Steering axis inclination
(D) Kingpin inclination
66. Which of the following is the disadvantage of the magneto ignition system?
(A) Magneto ignition system has more maintenance problems
(B) Magneto ignition system occupies more space
(C) Magneto ignition system has a poor quality of spark during starting
(D) Magneto ignition system is used largely in four wheels
67. The ignition timing is affected by _____
(A) Combustion chamber design
(B) Throttle opening
(C) Engine temperature
(D) All of the mentioned
68. What does the 'ply rating' refer to?
(A) Aspect ratio
(B) Rated Strength
(C) Recommended inflation pressure
(D) The actual number of plies
69. Which type of wheels cannot be used with a tubeless tyre?
(A) Disc wheel
(B) Light alloy wheel
(C) Wire wheel
(D) Composite wheel

70. What are the essential components of a battery ignition system?
(A) Battery (B) Ignition switch
(C) Ballast resistor (D) All of the mentioned
71. The licensing authority may refuse to issue a conductor's licence _____
(A) If the applicant does not possess the minimum educational qualification;
(B) If the medical certificate produced by the applicant discloses that he is physically unfit to act as a conductor
(C) If any previous conductor's licence held by the applicant was revoked
(D) All of the above
72. Which of the following is one of the major exhaust emissions from CI engines compared to SI engines?
(A) Oxides of nitrogen (B) Particulates
(C) CO and CO₂ (D) Unburnt hydrocarbon
73. For what purpose is the Rhodium used?
(A) To reduce CO and HC (B) To reduce NO_x
(C) To reduce CO (D) To reduce HC
74. What are the types of Multi-point Fuel Injection System?
(A) Port Injection (B) Throttle body injection
(C) Port & throttle body injection (D) None of the mentioned
75. By means of EFI systems one can achieve the precise control of _____
(A) Fuel injection quality
(B) Injection rate during various stages of injection
(C) Injection pressure during injection
(D) All of the mentioned
76. Electric Vehicles are generally powered by _____
(A) Aluminum batteries (B) Lead-acid batteries
(C) Sodium batteries (D) Magnesium batteries
77. When was the first electric car invented?
(A) 1830 (B) 1985
(C) 1832 (D) 1945
78. In common rail fuel injection system, very high injection pressures of order of _____ bar.
(A) 1000 (B) 1500
(C) 2000 (D) None of the mentioned

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79. In MPFI-Electronic control system, the _____ sensor sends information about the engine speed.
- (A) Speed (B) Ignition
(C) Air-Flow (D) Air-Mass
80. Which of the following causes the photochemical smog?
- (A) Excess O₂ (B) CO and CO₂
(C) Soot and particulate matter (D) NO_x and HC
81. In case of vehicle breakdown on highways and major roads, reflective warning triangles shall be placed at a distance of _____ behind the broken-down vehicle.
- (A) Ten meters (B) Twenty meters
(C) Thirty meters (D) Fifty meters
82. The priority within the category of emergency vehicles shall be as follows:
- (A) Ambulance, Fire service vehicle, Police service vehicle
(B) Fire service vehicle, Police service vehicle, Ambulance
(C) Fire service vehicle, Ambulance, Police service vehicle
(D) Ambulance, Police service vehicle, Fire service vehicle
83. The meaning of the word "traffic" is
- (A) Vehicles of every description (B) Pedestrians
(C) Herded animals (D) Includes all of the above
84. A vehicle may be overtaken from the left if
- (A) The vehicle which is to overtake and the vehicle which is to be overtaken are both driving on a multi-lane road and the vehicle ahead can be safely overtaken in a marked lane to the left of the vehicle being overtaken
(B) The vehicle to be overtaken is either turning right or making a 'U' turn from the centre of the road and is giving a signal to turn and it would be safe to overtake it from the left
(C) The vehicle to be overtaken is stationary and it is safe to pass it from the left
(D) In all the above circumstances
85. The driver shall switch on the fog light headlamps only when the visibility is considerably affected due to fog, dust, rain or snow and to be used along with _____
- (A) Dipped headlamps (B) High beam
(C) Extra light (D) Spot light

86. No person shall be granted a learner's licence to drive a transport vehicle unless he has held a driving licence to drive a light motor vehicle for at least _____
- (A) Two years (B) One year
(C) Three years (D) Six months
87. A person obtaining a driving licence to drive a Light Motor Vehicle at the age of completing 18 years and one month, be effective for a period _____
- (A) Twenty years
(B) Until the date on which such person attains the age of 50 years
(C) Until the date on which such person attains the age of 40 years
(D) Ten years
88. As per the Motor Vehicles Act, 1988 a licence to drive a transport vehicle carrying hazardous goods is issued for a period of _____
- (A) One year (B) Two years
(C) Three years (D) Five years
89. If the application for renewal is made more than _____ after the driving licence has ceased to be effective, the applicant has to pass the test of competence to get the driving licence renewed.
- (A) One month (B) One year
(C) Three years (D) Five years
90. Which of the following is not included in the class of vehicles for the purpose of driving licence as per Section 10(2) of the Motor Vehicles Act, 1988?
- (A) Motorcycle with gear (B) Adapted vehicle
(C) Transport vehicle (D) Medium Goods vehicle
91. Which one of the following is not a Transport Vehicle?
- (A) Public Service Vehicle (B) Private Service Vehicle
(C) Educational Institution Bus (D) None of the above
92. A motor vehicle constructed or adapted to carry more than six passengers, but not more than twelve passengers, excluding the driver, for hire or reward is
- (A) Omni Bus (B) Private Service Vehicle
(C) Maxi Cab (D) Motor Cab

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93. If a motor cycle is found driven by a juvenile with the knowledge of the guardian / owner, _____
- (A) The guardian / owner shall be punishable with imprisonment for a term which may be extended to three years
 - (B) The guardian / owner shall be liable to remit the fine of Rs. 25000/-
 - (C) The registration certificate of the vehicle shall be suspended temporarily
 - (D) All of the above
94. A Goods Carriage having Gross Vehicle Weight 11500 Kg is categorized as a
- (A) Light Motor Vehicle
 - (B) Medium Motor Vehicle
 - (C) Heavy Motor Vehicle
 - (D) N1 Category Vehicle
95. Which one of the following is excluded from the calculation of purchase value of realising life time tax of a motor car?
- (A) Discount given by the dealer
 - (B) Goods and Services Tax (GST)
 - (C) Tax Collection at Source (TCS)
 - (D) Custom / Excise duty of an imported motor car
96. Who among the following is exempted from wearing protective head gear (Helmet) while driving / riding a motor cycle?
- (A) All Sikh persons, if he wears Turban or not
 - (B) Children below the age of 6
 - (C) Pillion riders
 - (D) None of the above
97. Who among the following officer is empowered to seize and detain a motor vehicle for non-payment of vehicle tax and also to sell the vehicle in public auction for realising tax arrears?
- (A) Joint Regional Transport Officer
 - (B) Motor Vehicle Inspector
 - (C) Assistant Motor Vehicle Inspector
 - (D) All of the above
98. Which of the following type of vehicles is liable to pay green tax at the time of new registration?
- (A) All category of Diesel vehicle
 - (B) Diesel Motor cars
 - (C) All four wheeled vehicles using fuel other than LPG / CNG / Electric
 - (D) Petrol Motor vehicle having four wheels or more

99. Cancellation of registration of a motor vehicle is not applicable to
- (A) Removal of vehicle to another state
 - (B) Removal of vehicle to another country
 - (C) A motor vehicle is destroyed permanently
 - (D) None of the above
100. Who among the following is eligible for applying driving licence to drive a Transport Vehicle?
- (A) Person attains the age of 18 and minimum one year experience in driving Light Motor Vehicle
 - (B) Person attains the age of 18 and minimum educational qualification of passed in 8th standard
 - (C) Person attains the age of 20 and minimum one year experience in driving Light Motor Vehicle
 - (D) Person attains the age of 20 and minimum educational qualification of passed in 8th standard
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SPACE FOR ROUGH WORK