

02/23

Question Booklet Alpha Code

A

	Question Booklet Sl. No.
--	--------------------------

A

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

02/23

A

-2-

- _____ is used to check warpage of an engine cylinder head.
 - Straight edge ruler
 - Dial gauge
 - Plastic gauge
 - V blocks
- An odometer is an instrument used to measure _____ in automobiles.
 - speed
 - odour
 - direction
 - distance
- Which type of fire extinguisher is used for fire due to liquids ?
 - class A
 - class B
 - class C
 - class D
- Which among the following devices can be used to spot short circuits in the armature ?
 - voltmeter
 - ammeter
 - growler
 - multimeter
- The measuring device used to find the thickness of sheet metals is
 - Steel rule
 - Wire gauge
 - Vernier caliper
 - Feeler gauge
- A bolt of M24 × 2 means that
 - the pitch of the thread is 24 mm and depth is 2 mm
 - the nominal diameter of the bolt is 24 mm and the pitch is 2 mm
 - the cross sectional area of the thread is 24 mm
 - the effective diameter of the bolt is 24 mm and there are 2 threads per cm
- The difference between the upper limit and lower limit of a dimension is called
 - Basic size
 - Nominal size
 - Tolerance
 - Actual size
- Which type of personal protective item can be used to protect eyes ?
 - Cap
 - Goggles
 - Gloves
 - Mask
- Which type of Energy Conservation Opportunity (ECOs) involves stopping of water leakage points ?
 - Major energy conservation opportunities
 - Medium energy conservation opportunities
 - Extra major energy conservation opportunities
 - Minor energy conservation opportunities

02/23

10. The process for enlarging or finishing a previously drilled hole is known as
A) Drilling
B) Reaming
C) Tapping
D) Lapping
11. Read the statements given below and choose the correct option.
Statement A : The ignition spark occurs as the piston nears TDC at the end of the compression stroke.
Statement B : The spark occurs while the intake and exhaust valves are closed.
A) Statement A is correct
B) Statement B is correct
C) Both statements are correct
D) Both statements are wrong
12. A two stroke engine is normally equipped with a
A) train valve
B) poppet valve
C) reed valve
D) all of the above
13. Connecting rod connects crankshaft and the
A) Cylinder head
B) Cylinder block
C) Camshaft
D) Piston
14. Vibration damper is mounted on
A) the front end of the crankshaft
B) the back end of the crankshaft
C) the front end of the camshaft
D) none of these
15. Choose the correct statement.
A) inlet and exhaust valves are of the same size
B) the size of the inlet valve is more
C) the size of the exhaust valve is more
D) the size of the valves depends upon the capacity of an engine
16. The purpose of the thermostat is to keep the engine
A) hot
B) cool
C) at desired temperature
D) none of the above
17. Antiknock quality of gasoline is measured by
A) oxidation number
B) vaporization number
C) octane number
D) detonation number

A

18. Read the statements given below and choose the correct option.

Statement A : A plastic scraper can be used any gasket material from the head.

Statement B : A reamer can be used to clean the valve guides.

- A) Statement A is correct B) Statement B is correct
C) Both statements are correct D) Both statements are wrong

19. The swept volume of a cylinder in an engine is

- A) cross sectional area \times stroke
B) cross sectional area / stroke
C) total volume + clearance volume
D) none of the above

20. The distance between the centres of the front wheel is called

- A) Axle width B) Wheel base
C) Track D) Turning circle

21. In cars having rack and pinion steering, the gear rack is attached to

- A) relay rod B) pitman axis
C) cross shaft D) tie rod

22. The function of master cylinder is

- A) to increase pressure equally in all cylinders
B) to increase pressure unequally in all cylinders
C) to decrease pressure unequally in all cylinders
D) to decrease power equally in all cylinders

23. The camber of leaf spring is

- A) The amount of bend that is given to the spring from the central line, passing through the eyes
B) Distance between both eyes
C) The vertical distance between middle of the main leaf to imaginary line connecting the two eyes of the spring
D) Options A and B are correct

24. Slack adjuster is used in air brake system to adjust

- A) Scam B) Wheel cylinder
C) Back plate eccentric D) Brake valve

A

02/23

25. Identify which is not a type of frame ?
A) conventional frame
B) half-integral frame
C) integral frame
D) semi-integral frame
26. Which transmission system member among the following helps to vary the leverage between engine and road wheels ?
A) Clutch
B) Gear box
C) Propeller shaft
D) Differential
27. Normal force acting on the friction surface is greater than the axial force in the case of
A) Cone clutch
B) Single plate clutch
C) Multi-plate clutches
D) Wet clutch
28. Which among the following is not supposed to be operated by the user ?
A) Single plate clutch
B) Multi-plate clutch
C) Centrifugal clutch
D) Semi centrifugal clutch
29. Gears in sliding mesh gear box are
A) Cycloidal gears
B) Worm gears
C) Helical gears
D) Spur gears
30. The driving / driver shaft of the gear box is also known as
A) Clutch shaft
B) Lay shaft
C) Counter shaft
D) Main shaft
31. The member which multiplies the torque in a torque converter is
A) Impeller
B) Turbine
C) Planetary gear
D) Stator
32. In order to accommodate the variation in length, a propeller shaft must have
A) Hooks joint
B) Slip joint
C) Leaf spring
D) Torsional spring
33. Which of the following member is used to hold the rear axle in position against side thrust ?
A) Radius rod
B) Thrust member
C) Panhard rod
D) Thrust spring

A

34. Type of wheel desirable in racing cars is
A) Magnesium alloy wheel B) Disc wheel
C) Aluminium alloy wheel D) Wire wheel
35. When loading a vehicle, the load distribution should be
A) More at front wheels
B) More at right wheels
C) More at rear wheels
D) Equal at all wheels
36. In modern diesel engines pilot injection is aimed at
A) Reducing noise B) Reducing NO_x emissions
C) Both A and B D) None of the above
37. In CRDI system, the maximum pressure developed by the high pressure pumps is usually
A) 200 bar B) 1600 bar
C) 1200 bar D) 800 bar
38. Switching speed of piezo injector is how many times than that of a solenoid valve
A) two B) three
C) four D) five
39. In petrol electronic fuel injection system, the amount of fuel drawn by the fuel pump is
A) same as the required B) half the required
C) less than the required D) more than the required
40. Which sensor is used to correct the air density variation with atmospheric temperature ?
A) MAP sensor B) BARO sensor
C) MAT sensor D) TPS sensor
41. Which electronic unit gives signal to control IAC valve ?
A) EDU B) ECM
C) Solenoid D) SCV
42. How many petrol injection systems are there, according to the duration and timing of fuel injection ?
A) Four B) Two
C) Three D) Five

02/23

43. Compared to First Generation Air Bags, Second Generation Air Bags inflates with
A) More energy
B) Less time
C) More force
D) Less force
44. Which type of seat belt operates automatically with no action required by the vehicle's occupant ?
A) Passive restraint
B) Retractor
C) Active restraint
D) Anchorage
45. A high-speed CAN BUS communicates with a scan tool through which terminal(s) ?
A) 4 and 16
B) 6 and 14
C) 7 and 15
D) 2
46. In an Air conditioning system, the subcooled liquid refrigerant flows from the receiver drier to
A) Compressor
B) Condenser
C) Expansion Valve
D) Blower
47. Relative humidity for comfort levels is generally about
A) 25%
B) 70%
C) 50%
D) 60%
48. The desiccant used inside the receiver for R-134a is
A) Silica gel
B) Zeolite
C) Both A and B
D) None of the above
49. Ambient temperature sensor is fitted near the
A) A/C controls panel
B) Compressor
C) Condenser
D) Evaporator
50. The greatest source of refrigerant leakage is
A) Flexible hoses
B) Schrader valves
C) Connector seals
D) Compressor seal
51. Stoichiometric air fuel ratio of petrol by mass is nearly
A) 15 : 1
B) 20 : 1
C) 7 : 1
D) 30 : 1
52. Compared to petrol, hydrocarbon emissions for Ethanol as a SI engine fuel is
A) More
B) Less
C) Same
D) Zero

A

53. In the case of CI engines, the delay period decreases with
 A) Decrease in intake temperature B) Increase in injection advance angle
 C) Increase in compression ratio D) None of the above
54. Combustion in the third stage is rapid in the case of
 A) Turbulent chamber B) M Combustion chamber
 C) Energy cell D) Pre Combustion chamber
55. What is the basic fuel for a fuel cell ?
 A) Hydrogen B) Methanol
 C) Electricity D) Gasoline
56. A $30 \mu\text{F}$ capacitor is connected across a 400 V supply. If the reactance of the capacitor is 100 Ohms, the value of the current is
 A) 500 A B) 4000 A C) 4 mA D) 4A
57. With given details of junction transistor, match the followings :
 1. joining P type germanium to N-P junction a. electrons
 2. joining N type germanium to P-N junction b. holes
 3. charge carriers in PNP junction c. PNP type
 4. charge carriers in NPN junction d. NPN type
 A) 1-d, 2-c, 3-b, 4-a
 B) 1-c, 2-d, 3-a, 4-b
 C) 1-b, 2-a, 3-d, 4-c
 D) 1-c, 2-d, 3-b, 4-a
58. Which of the following statement is/are correct about Field Effect Transistor (FET) ?
 1. FET is unipolar.
 2. FET is not a majority carrier device.
 3. FET is having high impedance and better thermal stability.
 4. FET is having low impedance and poor thermal stability.
 A) only 1 and 3 B) only 1 and 2
 C) only 2 and 3 D) only 1 and 4
59. Three capacitors have capacitance of $2\mu\text{F}$, $4\mu\text{F}$ and $4\mu\text{F}$. The total capacitance when they are connected i) in parallel and ii) in series respectively is
 A) $1\mu\text{F}$ and $10\mu\text{F}$ B) $10\mu\text{F}$ and $1\mu\text{F}$
 C) $1\mu\text{F}$ and $1\mu\text{F}$ D) $10\mu\text{F}$ and $10\mu\text{F}$

02/23

60. Zener diodes are available for voltage output control purpose with Zener voltages range from
A) 1 to 10 V B) 3 to 100 V C) 1 to 50 V D) 1 to 300 V
61. The applications of phototransistors includes
1. photo-electric counting and speed indication
2. automotive pollution control
3. automotive parking and head light control
4. automotive electronic ignition
A) 1 and 2 B) 2 and 3 C) 3 and 4 D) 1 and 3
62. According to Fleming's right hand rule, the direction of e.m.f. is represented by
A) first finger of the right hand
B) thumb of the right hand
C) second finger held at right-angle to both the thumb and first finger
D) second finger held inclined at an angle to both thumb and first finger
63. A conductor carries a current of 1000 A at right-angles to a magnetic field having a density of 2 T. The force on the conductor with 2 m length is
A) 1000 N B) 500 N C) 0.004 N D) 4000 N
64. The number of ignition coils required for the eight cylinder V-8 engine with distributorless ignition is
A) 1 B) 4 C) 8 D) 16
65. The specific gravity of sulphuric acid of a lead-acid battery at 100% charge, 50% charge and 0% charge are
A) 1.28, 0.64 and 0 B) 1.68, 1.40 and 1.2
C) 1.28, 0.80 and 0.5 D) 1.28, 1.20 and 1.12
66. Which of the following statement is/are correct about fully charged lead-acid battery ?
1. The active material in positive plate is lead peroxide.
2. The active material in positive plate is sponge lead.
3. The active material in negative plate is sponge lead.
4. The active material in negative plate is lead peroxide.
A) only 1 and 3 B) only 1 and 4
C) only 2 and 3 D) only 2 and 4

A

67. The capacity increase of a lead-acid battery with 20-hour rate of discharge than 10-hour rate of discharge is approximately
 A) 100% B) 50% C) 5% D) 20%
68. The electrolyte for lead-acid battery is prepared by mixing commercial concentrated sulphuric acid with distilled water approximately in the proportion of
 A) 8 parts of acid to 3 parts of water
 B) 3 parts of acid to 8 parts of water
 C) 5 parts of acid to 8 parts of water
 D) 8 parts of acid to 5 parts of water
69. For trickle charging of lead-acid battery, the amount of charging rate used should be
 A) 10 to 25% of normal charging current
 B) 20 to 50% of normal charging current
 C) 2 to 5% of normal charging current
 D) 20 to 30% of normal charging current
70. Match the followings for the ignition coil of automobile ignition system.
- | | |
|---|---------------------|
| a. number of turns in primary winding | 1. about 20 S.W.G. |
| b. number of turns in secondary winding | 2. 15,000 to 20,000 |
| c. wire thickness of primary winding | 3. about 40 S.W.G. |
| d. wire thickness of secondary winding | 4. 200 to 300 |
- A) a-2, b-3, c-1, d-4
 B) a-4, b-2, c-1, d-3
 C) a-1, b-2, c-3, d-4
 D) a-4, b-3, c-2, d-1
71. In the battery coil ignition system, expression for the instantaneous value of primary current is
 A) $i = \frac{V}{R} \left(1 - e^{-\frac{L}{Rt}} \right)$ B) $i = \frac{V}{R} \left(1 - e^{-\frac{Rt}{L}} \right)$
 C) $i = \frac{R}{V} \left(1 - e^{-\frac{Rt}{L}} \right)$ D) $i = \frac{V}{R} \left(e^{-\frac{Rt}{L}} - 1 \right)$

02/23

72. For automotive ignition system, match the followings :

- | | |
|--------------------------------------|----------------------|
| 1. spark plug gap | a. 0.35 mm to 0.4 mm |
| 2. contact breaker gap | b. 0.60 mm to 1 mm |
| 3. dwell angle for 4-cylinder engine | c. 36° to 42° |
| 4. dwell angle for 6-cylinder engine | d. 48° to 52° |
- A) 1-a, 2-b, 3-d, 4-c
B) 1-b, 2-a, 3-d, 4-c
C) 1-b, 2-a, 3-c, 4-d
D) 1-c, 2-b, 3-d, 4-a

73. With details regarding the spark plug, match the followings :

- | | |
|--|---------------------|
| 1. Combustion chamber temperature | a. above 750°C |
| 2. Electrode temperature at which pre-ignition occurs | b. 2400°C to 2600°C |
| 3. Electrode temperature at which carbon or oil deposits | c. 500°C to 600°C |
| 4. Optimum electrode temperature | d. below 300°C |
- A) 1-b, 2-a, 3-d, 4-c
B) 1-a, 2-b, 3-d, 4-c
C) 1-a, 2-b, 3-c, 4-d
D) 1-a, 2-c, 3-b, 4-d

74. Which of the following statement is/are correct ?

1. Flywheel magneto runs at the speed of camshaft.
 2. Dwell meter is used to measure spark plug gap.
 3. Feeler gauge or dwell meter is used to measure contact breaker gap.
 4. The maximum ignition advance by vacuum advance mechanism is 15 to 30 crankshaft degrees.
- A) only 1 and 2
B) only 2 and 3
C) only 3 and 4
D) only 2 and 4

75. The types of coil winding used in the armature of generator are

- | | |
|---------------------------|---------------------------|
| A) star and lap winding | B) wave and delta winding |
| C) star and delta winding | D) lap and wave winding |

A

76. The output voltage of an alternator not depends on
- A) rotor speed
 - B) number of turns in starter winding
 - C) field current
 - D) current regulator
77. In an electromagnet starter motor, the armature windings are made of
- A) many loops of heavy wire
 - B) few loops of heavy wire
 - C) few loops of thin wire
 - D) many loops of thin wire
78. The flywheel ring gear has about 15 times as many teeth as the pinion. When starter motor operates, if the armature spins at 3000 rpm, then the speed of the crankshaft is
- A) 450 rpm
 - B) 200 rpm
 - C) 2000 rpm
 - D) 4500 rpm
79. The primary function of an over running clutch in the starter motor is
- A) to transmit torque in both direction
 - B) to increase cranking speed
 - C) to prevent damage to armature from spinning at high speed
 - D) to engage the starter pinion with ring gear
80. The two types of fuses used in automobiles are
- A) cartridge and blade
 - B) breaker and cartridge
 - C) blade and breaker
 - D) link and printed
81. The mostly used firing order of six cylinder engine is
- A) 1-5-3-4-2-6
 - B) 1-3-5-2-4-6
 - C) 1-5-6-3-2-4
 - D) 1-5-3-6-2-4
82. Electronic ignition system consists of
- A) make and break mechanism
 - B) solenoid switch
 - C) contact breaker mechanism
 - D) pulse generator or Hall-effect switch
83. In third brush generator, the third brush is placed somewhere where the flux becomes
- A) stronger at the higher speeds due to armature reactions
 - B) weaker at the higher speeds due to armature reactions
 - C) weaker at the lower speeds due to armature reactions
 - D) stronger at the lower speeds due to armature reactions

02/23

84. Which of the following statement is correct about current voltage regulator ?
- A) Both current and voltage regulator operates simultaneously
 - B) When battery charge is low, voltage regulator will operate
 - C) When battery charge is low, current regulator will operate
 - D) When battery charge is full, current regulator will operate
85. Keyless entry systems can be operated by a small hand-held transmitter upto distance of
- A) 100 m
 - B) 200 m
 - C) 50 m
 - D) 10 m
86. The vehicle location on the road can be shown by
- A) theft control system
 - B) night vision system
 - C) electronic navigation system
 - D) lane detection system
87. In the floor-type head light aiming system, the distance between the car and screen should be
- A) 15.2 m
 - B) 7.6 m
 - C) 25 m
 - D) 7.6 feet
88. The pitch of the electrically-operated horn sound is determined by
- A) horn button
 - B) horn relay
 - C) time period of pressing horn
 - D) number of vibrations per second
89. In a capacitor-discharge ignition, the spark occurs when
- A) the capacitor charges with battery voltage
 - B) the capacitor charges with 50,000 V
 - C) a transistor or switch closes the primary circuit
 - D) a transistor or switch opens the primary circuit
90. The stationary magnetic field in the magnetic starter motor is produced by the
- A) brushes and commutator
 - B) field windings in electromagnet or permanent-magnet
 - C) armature windings
 - D) relay or solenoid
91. The unit of Density in SI unit is
- A) kg/m^3
 - B) m^3/kg
 - C) kg/m^2
 - D) N/m^3

A

02/23

Space for Rough Work



A