

H.P.BOARD OF DEPARTMENTAL EXAMINATION  
DEPARTMENTAL EXAMINATION OF IAS/HAS OFFICERS OF  
HIMACHAL PRADESH  
April, 2016

Paper: 12

Motor Mechanism and Driving

Time: 1.30 hours

Maximum Marks = 50

Note:-

1. Candidate may answer the question in Hindi or English.
2. Attempt all questions from Part A and any five from Part-B.
3. Bare Act is allowed.

PART-A

Q.No.1 Explain the functions of any five in the motor vehicle. (1X5=5)

- a) Turbocharger
- b) Mounting pin
- c) Head gasket
- d) Clutch
- e) Axle shaft
- f) Battery
- g) Universal joints
- h) Fuel gauge

Q.No. 2 Attempt any five question (2X5=10)

- a) What is the 'Compression ratio' of an engine?
- b) Explain the function of Engine foundation.
- c) Explain briefly working of engine cooling system.
- d) Explain Blow by.
- e) Why 'Multivalve' Engines are more fuel efficient than 'Two-Valves/Cylinder' ones?
- f) State any four advantages of independent suspension system over rigid axle suspension system.
- g) What are the functions of a shackle pin?
- h) How are the wheels and tyres designated?

Q.No.3 Answer any ten questions by selecting the correct choice. (1X10=10)

1. The motion of the cam is transferred to the valves through
  - a. Pistons
  - b. Valve stems
  - c. Rocker arms
  - d. Camshaft pulley

2. The device for smoothing out the power impulses from the engine is called the
  - a. Clutch
  - b. Flywheel
  - c. Camshaft
  
3. The brake shoes are curved to conform to the inner diameter of the
  - a. Pedal
  - b. Brake drum
  - c. Wheel
  - d. Tyre
  
4. Which is not the common component between a petrol and diesel engine?
  - a. Crank shaft
  - b. Connecting rod
  - c. Ignition coil
  - d. Cam shaft
  
5. The main function of intake manifold is that it
  - a. promotes the mixture of air and fuel
  - b. distributes intake air equally to the cylinders
  - c. reduces intake noise
  - d. cools the intake air to a suitable temperature
  
6. It is necessary to maintain the valve clearance as they
  - a. reduce the resistance to sliding that occurs between the cam and the tappet
  - b. allow the lengthening of the valves owing to the heat of the combustion
  - c. make the crankshaft turn smoothly
  - d. increase the speed at which the valves move up and down
  
7. What type of bearing is used for main bearing and connecting rod bearings?
  - a. Ball bearings
  - b. Plain bearings
  - c. Needle roller bearing
  - d. Taper roller bearing
  
8. If the engine coolant leaks into the engine oil, then engine oil
  - a. turns black
  - b. appears milky
  - c. becomes foamy
  - d. none of these
  
9. The function of an alternator in an automobile is to
  - a. continually recharge the battery
  - b. supply electric power
  - c. partly convert engine power into electric power
  - d. convert mechanical energy into electrical energy

10. The torque available at the contact between driving wheels and road is known as
- brake effort
  - tractive effort
  - clutch effort
  - none of these
11. In an operating engine, the hottest part of the piston is the
- Head
  - Ring grooves
  - Skirt
  - Pin bosses
12. Aluminium alloy pistons are preferred because
- They are good absorbers of shock
  - They are having less weight
  - They have good water resistance
  - They are very strong in tension

### **PART-B**

**Q.No. 4.** As per provision of the Motor Vehicle Act, define any five of the following:-  
(1X5)

- Certificate of Registration
- Contract carriage
- Articulated vehicle.
- Gross Vehicle weight.
- Maxi cab.
- Trailer.

**Q.No.5.** What is the role of any two of the following authorities? (2.5X 2=5)

- Motor Accident Claim Tribunal.
- Registering & Licensing Authority.
- Motor Vehicle Inspector.

**Q.No. 6** What do you understand by any five of the following:- (1X5=5)

- Extension of route.
- Diversion of route.
- Curtailement of route.
- Modification of route
- Restoration of route.
- Corridor.

**Q.No.7** Whether any contract carriage bus can operate daily on fixed route, fixed timing as stage carriage? What is procedure envisaged under Motor Vehicle Act 1988 for regulating Contract carriage? (5)

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**Q.No. 8** Under what circumstances Driving License can be suspended and cancelled. (5)

**Q.No.9** Why insurance of Motor vehicle is necessary? Explain briefly extent of Liability of the insurer in case of any motor vehicle accident. (5)

**Q.No.10.** What are the essential documents/tools required to be kept always with vehicle during operation? (5)