23124

3 Hours / 70 Marks   Seat No.

Instructions : (1) All Questions are *compulsory*.

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. **Attempt any FIVE of the following :**   **10**

(a) Define automobile engine and engine capacity.

(b) State two advantages and disadvantages each of two stroke engine.

(c) State the functions of flywheel in engine.

(d) Define carburation and list types of carburettors.

(e) Enlist types of ignition systems used in automobile.

(f) State the functions of lubricating oil.

(g) Define mechanical efficiency and thermal efficiency.

2. **Attempt any THREE of the following :**   **12**

(a) Compare 2 stroke engine with 4 stroke engine.

(b) State any two functions of gaskets and enlist any two types of gaskets used in engine.

(c) Explain construction & working of Fuel injector.

(d) Describe with neat sketch construction & working of radiator.

3.   Attempt any THREE of the following :   12

(a)   Describe the working principle of four stroke petrol engine with PV diagram.

(b)   Explain the constructional features of piston pin with their material.

(c)   Describe with neat sketch working of battery ignition system.

(d)   State the firing order used for 4 and 6 cylinder engines with justification.

4.   Attempt any THREE of the following :   12

(a)   State the applications of I.C. engines.

(b)   Select material for following parts of a engine :

   (i)   Cylinder block

   (ii)   Piston

   (iii) Connecting rod

   (iv)   Piston rings

(c)   Select muffler for a two wheeler engine with justification.

(d)   Explain construction & working of thermostat valve with neat sketch.

(e)   A six cylinder gasoline engine works on 4 stroke cycle. The bore of each cylinder is 80 mm and stroke 100 mm. The clearance volume per cylinder is 70 cc. At a speed of 4000 rpm the fuel consumption is 20 kg/hr and torque developed is 150 N-m. Calculate :

   (i)   Brake power

   (ii)   Brake thermal efficiency if calorific value of fuel is 43000 kJ/kg.

5.   Attempt any TWO of the following :   12

(a)   Explain valve operating mechanism for front wheel drive car with neat sketch.

(b)   Explain with neat sketch construction and working of mechanical governor.

(c)   Describe the procedure for dismantling and reassembly of fuel injection pump of a diesel engine.

6. **Attempt any TWO of the following :** 12

   (a) Describe with neat sketch construction and working of hydraulic dynamometer.

   (b) Select a proper lubricant and lubrication system for a passenger car with justification.

   (c) The following details were noted in a test on a 4 cylinder, 4 stroke engine :

   bore dia. = 100 mm ; stroke = 120 mm ; speed of engine = 1600 rpm,

   Fuel consumption = 0.2 kg/min ;

   Calorific value of fuel = 44000 kJ/kg ;

   Difference in tension on either side of the brake pulley = 40 kg ;

   Brake circumference diameter is 300 cm.

   If the mechanical efficiency is 80%.

   Calculate :

   (i) Indicated thermal efficiency

   (ii) Indicated mean effective pressure

   (iii) Brake specific fuel consumption

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