

22308

11819

3 Hours / 70 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Illustrate your answers with neat sketches wherever necessary.
 - (3) Figures to the right indicate full marks.

Marks

1. Attempt any FIVE :

5 × 2 = 10

- (a) Define internal combustion Engine.
- (b) Classify I.C. Engine on the basis of
 - Cycle of operation
 - Method of cooling
- (c) State the function of Exhaust Manifold.
- (d) List the functions of Air filter.
- (e) State the common firing orders used in 4 Cylinder engine.
- (f) List any two advantages of water cooling over Air Cooling.
- (g) Define Brake power and frictional power.

2. Attempt any THREE :

3 × 4 = 12

- (a) Describe the working of four stroke C.I. engine with neat sketch.
- (b) Compare Dry Liner and Wet Liner.
- (c) Describe the working of Idling circuit used in Carburettor.
- (d) Describe the working of water/liquid cooling system with neat sketch.

3. Attempt any THREE :**3 × 4 = 12**

- (a) Show the following components in an engine with neat sketch :
Piston, Connecting Rod, Valves, Spark Plug
- (b) Distinguish between overhead cam and overhead valve arrangement.
- (c) Illustrate with neat sketch the construction of fuel injector.
- (d) State the use of oil additives used in lubricating oil.

4. Attempt any THREE :**3 × 4 = 12**

- (a) (i) State any two applications of I.C. Engine.
(ii) Draw a neat sketch of Two Stroke Petrol Engine.
- (b) State any four requirements of gasket.
- (c) Sketch and label simple carburettor.
- (d) Describe the working of Electrical dynamometer.
- (e) Draw neat sketch of valve timing diagram for 4-stroke petrol engine & label it.

5. Attempt any TWO :**2 × 6 = 12**

- (a) While performing Morse test on a four cylinder petrol engine, the following result were obtained at a particular throttle setting and speed.
B.P. with all Cylinders working = 32.2 kW
B.P. with Cylinder no.1 Cutout = 22 kW
B.P. with Cylinder no. 2 Cutout = 21.8 kW
B.P. with Cylinder no. 3 Cutout = 22.2 kW
B.P. with Cylinder no. 4 Cutout = 22.8 kW
Determine I.P. of the engine and its mechanical efficiency.
- (b) Illustrate with neat sketch the working of battery ignition system.
- (c) (i) Illustrate the working of splash lubrication system.
(ii) State any two functions of lubrication system.

6. Attempt any TWO :**2 × 6 = 12**

- (a) (i) Describe the principle of mechanical governor in fuel injection pump.
(ii) State four types of injector nozzles.
- (b) (i) Illustrate with neat sketch the working of Absorber type of muffler.
(ii) Sketch bellow type of thermostat.
- (c) In a trial on a four cylinder engine 150 mm bore, 200 mm stroke and working on a four stroke cycle. The following observations were made :

Speed = 2500 rpm

Net dynamometer load at 500 mm radius = 200 N.

Power required to rotor with ignition off = 4.5 kW.

Petrol Consumption = 200 g/m minute

Cooling water circulated = 7.5 kg/minute

Temp. rise of Cooling water = 50° C

If the Calorific Value of Petrol = 46,000 kJ/kg

- (i) Calculate mechanical efficiency and indicated mean effective pressure.
(ii) Draw heat balance sheet for the test in kJ/kg.
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