



22308

12223

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 stroke.
- (b) Classify I.C. engine on the basis of
 - Method of charging
 - Camshaft layout
- (c) List any four components of exhaust system.
- (d) List the functions of fuel filter (any two).
- (e) State the reason for using proper firing order.
- (f) List two drawbacks of air cooling system.
- (g) Define indicated power and brake thermal efficiency.
- (h) State any two properties of lubricant.



- 2. Attempt any THREE :** **3 × 4 = 12**
- (a) Describe the working of four stroke S.I. engine with neat sketch.
 - (b) Compare two stroke engine with four stroke engine (any four points)
 - (c) Describe the working of acceleration circuit used in carburettor.
 - (d) Describe the working of pump circulation cooling system with suitable sketch.
- 3. Attempt any THREE :** **3 × 4 = 12**
- (a) With suitable sketch, show the engine nomenclature.
 - (b) Distinguish between overhead cam and overhead valve arrangement.
 - (c) List types of Injector nozzles and explain any one with suitable sketch.
 - (d) Classify lubricating oils on the basis of viscosity and service ratings.
- 4. Attempt any THREE :** **3 × 4 = 12**
- (a)
 - (i) Define scavenging. List types of scavenging.
 - (ii) Draw a neat sketch of two stroke petrol engine.
 - (b) State function and location of following engine components :
 - (i) Piston
 - (ii) Oil sump
 - (c) Sketch and label Dry type air cleaner.
 - (d) Describe the working of Eddy current dynamometer.
 - (e) Draw neat sketch of theoretical valve timing diagram for 4-stroke diesel engine and label it.

5. Attempt any TWO :**2 × 6 = 12**

- (a) A four stroke engine with four cylinders, bore 80 mm and stroke 100 mm was tested at 3500 rpm and following data were recorded :

Fuel consumption = 300 gm/min

Indicated m.e.p. = 1 MPa

Engine torque developed = 140 N-m.

If the calorific value of the fuel used is 42000 kJ/kg

Calculate :

- (i) I.P. of the engine
 - (ii) Mechanical efficiency
 - (iii) Brake thermal efficiency
- (b) Illustrate with neat sketch the working of Battery ignition system.
- (c) (i) Illustrate the working of dry sump lubrication system.
- (ii) State functions of following components :
- (1) Oil filter
 - (2) Oil pressure gauge

6. Attempt any TWO :**2 × 6 = 12**

- (a) (i) Describe the working of S.U. electrical fuel pump with suitable sketch.
- (ii) Draw a layout of petrol engine fuel feed system.
- (b) Illustrate with neat sketch the working of baffle type muffler.

- (c) An I.C. engine develops a brake power of 26.1 kW. Following observations were made during a trial.

Power required to motor the engine = 4.5 kW

Cooling water circulated = 7.5 kg/min

Specific heat of water = 4.187 kJ/kgk

Petrol consumption = 200 gm/min

Temperature rise of cooling water = 50 °C.

If the calorific value of petrol is 46000 kJ/kg. Draw heat balance sheet for the test on percentage basis.

