

17408

15116

3 Hours / 100 Marks

Seat No.

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- 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) Use of Non-programmable Electronic Pocket Calculator is permissible.
- (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. a) Attempt any SIX of the following : 12
- (i) Define scavenging.
- (ii) State any two merits of vertical I.C. Engine.
- (iii) State any two applications of I.C. Engine.
- (iv) List four moving parts of an I.C. Engine.
- (v) State the types of cooling system.
- (vi) Define the term, mechanical efficiency.
- (vii) State the function of cylinder liner.
- (viii) State the function of fuel injector.

P.T.O.

b) Attempt any TWO of the following :

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- (i) Compare two stroke and four stroke engine.
(minimum four points)
- (ii) Classify I.C. engine on the basis of :
 - (1) Cycle of operation
 - (2) Fuel
 - (3) Cooling methods
 - (4) Ignition
- (iii) Explain working of four stroke petrol engine with neat sketch

2. Attempt any FOUR of the following :

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- a) Explain the working of two stroke engine with neat sketch.
- b) Enlist the engine components.
- c) Draw the neat sketch of over-head valve mechanism, and its applications.
- d) State the material by which following engine components manufactured.
 - (i) Piston
 - (ii) Connecting rod
 - (iii) Camshaft
 - (iv) Piston pin
- e) Compare theoretical and actual valve timing diagram for four stroke petrol engine.
- f) List the types of camshaft drives. Draw the neat sketch of any one.

- 3. Attempt any FOUR of the following :** **16**
- a) Draw the neat sketch of piston and label all parts.
 - b) Explain with neat sketch, the working of electric fuel pump.
 - c) Explain the construction working of simple carburetor.
 - d) Explain the working principle of mechanical governor of FIP.
 - e) Explain the diesel fuel injector with neat sketch.
 - f) State different types of air-cleaners and explain any one of them.
- 4. Attempt any FOUR of the following :** **16**
- a) Explain the working of battery ignition system with neat sketch.
 - b) State the importance of firing order in multicylinder engine and write the firing order of 4 and 6 cylinder engine.
 - c) State the types of silencers and explain any one with neat sketch.
 - d) State the limitation of cooling system.
 - e) State the need of cooling system and compare various cooling systems.
 - f) Describe construction of radiator and the types of radiator cores.
- 5. Attempt any FOUR of the following :** **16**
- a) State the need, and describe the working of crank case ventilation (P.V.C.).
 - b) Draw the neat sketch of wet sump (pressure) lubrication system.
 - c) State the properties of lubricating oil.
 - d) List various components of lubricating system and state their function.
 - e) Describe construction and working of rope brake dynamometer.
 - f) Define the terms :
 - (i) Indicated power
 - (ii) Brake power
 - (iii) Mechanical efficiency
 - (iv) Indicated thermal efficiency

6. Attempt any TWO of the following :**16**

- a) Explain Morse test and William's line method for frictional power.
- b) During a test on a two stroke petrol engine, following readings were noted.
- (i) The engine is motored by an electric motor and frictional power loss recorded - on wattmeter is 1.5 kW.
 - (ii) Net brake load = 210 N
 - (iii) Dia. of brake wheel = 210 cm
 - (iv) Engine speed = 595 rpm
 - (v) Fuel consumption = 2.01 kg/hr.
 - (vi) Calorific value of fuel = 44000 KJ/kg
- Find mechanical efficiency and brake thermal efficiency.
- c) An I.C. engine uses 6 kg of fuel having calorific value 44000 kJ/Kg, in one hour. The brake power developed is 18 kW. The temperature of 11.5 kg of cooling water found to rise through 25°C per minute. The temperature of 4.2 kg of exhaust gas with specific heat 1 kJ/kg K was found to rise through 220°C. Draw heat balance sheet for the engine.
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