



17408

21718

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.

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- i) What is the necessity of engine lubrication ?
- ii) Define stroke.
- iii) What is the function of fuel injector ? (any two)
- iv) State two cooling water additives.
- v) Define mechanical efficiency of I.C. Engine.
- vi) State the functions of gasket. (any two)
- vii) Define Brake Power.
- viii) State the material of cylinder block and its manufacturing method.

B) Attempt **any two** of the following.

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- i) Explain working of electrical fuel pump with neat sketch.
- ii) Compare magneto and battery ignition system on the basis of
 - i) Source of current
 - ii) Starting of engine
 - iii) Space
 - iv) Applications.
- iii) Draw the valve timing diagram of a four stroke SI engine and explain in brief.

2. Attempt **any four** of the following.

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- a) What do you mean by firing order ? Give firing order for four cylinder engine.
- b) State four applications of IC engines. Write engine specifications for any two wheeler (4 parameters).
- c) State two advantages and two disadvantages of air cooling system.
- d) Explain with neat sketch common rail fuel injection system for CI engine.
- e) Explain in brief valve cooling with neat sketch.
- f) Describe with neat sketch principle of rope brake dynamometer.

P.T.O.



- 3. Attempt any two of the following. 16**
- Explain with neat sketch solex carburettor.
 - List the types of lubrication systems. Explain the pressurized lubrication system with neat sketch.
 - Compare dry liner and wet liner (any four points).
 - State two functions of flywheel and piston rings each.
- 4. Attempt any four of the following. 16**
- What is scavenging? Describe any one method of scavenging.
 - Define
 - Indicated power
 - Frictional power.
 - State the materials for cylinder head and crankshaft. Also write their manufacturing process.
 - Explain the function of the following :
 - Thermostat
 - Pressure cap.
 - Explain the working of four stroke petrol engine.
 - State the function of exhaust manifold. Explain any one type of silencer.
- 5. Attempt any four of the following. 16**
- Describe four properties of lubricating oil.
 - Define
 - Compression ratio
 - Swept volume.
 - Explain the air-fuel ratio requirements for SI engine.
 - Explain with neat sketch positive crankcase ventilation .
 - Explain with neat sketch overhead valve mechanism.
 - State two merits and two demerits of vertical engine.
- 6. Attempt any two of the following. 16**
- What are the various methods for measuring frictional power? Describe morse test.
 - A four stroke cycle diesel engine gave the following data during a trial of 50 minutes duration.

Brake power = 37 kw
 Fuel used = 10 kg
 Calorific value of fuel oil = 46000 KJ/kg
 Air used per kg of fuel = 35 kg
 Temperature of exhaust gases = 380°C
 Room Temperature = 20°C
 Sp. heat of exhaust gases = 1.005 KJ/kg K
 Mass of jacket cooling water circulated = 750 kg
 Temperature of jacket cooling water at inlet and outlet 20°C and 70°C respectively. Draw neat balance sheet on minute basis.
 - Following readings were noted during a test on a single cylinder 2-stroke diesel engine. Engine is motored by an electric motor and frictional power loss recorded on wattmeter is 1.25 kw

Net brake load = 225 N
 Diameter of brake wheel = 100 cm
 Engine Speed = 500 rpm
 Fuel consumption = 2.04 kg/hr
 Calorific value of fuel = 42000 KJ/kg
 Find Mechanical efficiency and brake thermal efficiency.
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