22308

21819

3 Hours / 70 Marks Seat No. | | | | | | | | |

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

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

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

(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 the terms : Swept volume

(b) Classify I.C. engine on the basis of cycle of operation and cylinder arrangement.

(c) List any four components of C.I. engine.

(d) List all the components of petrol fuel supply system.

(e) State four functions of exhaust system.

(f) State the need of cooling system of I.C. engine.

(g) Define 'Indicated power'.

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

(a) Write the specifications of I.C. engine used in a two wheeler four stroke vehicle.

(b) Explain working of overhead valve mechanism with neat sketch.

(c) State the functions of nozzles. Classify nozzles used in diesel engine.

(d) Distinguish between air cooling system and water cooling system.

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

(a) Describe working principle of four stroke diesel engine with the help of sketches.

(b) State the functions and materials of following engine components :

(i) Piston

(ii) Connecting rod

(iii) Crank shaft

(iv) Exhaust manifold

(c) State the function of following ignition system components :

(i) Ignition coil

(ii) Distributor

(iii) Condenser

(iv) Spark plug

(d) Draw a simple diagram of distributor rotor, its direction, spark plug high voltage contact for a 6 cylinder engine. Also label numbers as per firing order.

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

(a) List different applications of I.C. engines.

(b) Differentiate between dry liner and wet liner.

(c) Select type of a muffler for a motorcycle engine with justification.

(d) Describe the construction and working of thermostat valve used in cooling system.

(e) In a test on a 2-stroke single cylinder diesel engine, following observations were made :

Bore = 75 mm,

Stroke = 90 mm,

Engine Speed = 1200 rpm,

Mean effective pressure = 7.5 bar,

Mean brake diameter = 1m,

Net brake load = 500 N.

Calculate mechanical efficiency of engine

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

(a) Draw the neat sketch of overhead valve operating mechanism and explain its working.

(b) List any two major requirements of fuel injection system. Draw a layout of fuel injection system used in diesel engine.

(c) Draw a labelled sketch of pump feed fuel supply system for petrol engine and state location and function of each component.

P.T.O.

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

(a) Explain the procedure of 'Morse Test' to be conducted for four cylinder petrol engine.

(b) Classify lubricating oil using viscosity (SAE) and load severity (API) rating.

(c) In a trial on a four cylinder engine 100 mm bore, 150 mm stroke and working on a four stroke cycle. The following observations were made :

Speed = 2500 rpm

Net Dynamometer load of 50 mm radius = 200 N

Mechanical efficiency = 80%

Petrol consumption = 752 g/minute

Cooling water circulated = 200 g/minute

Temperature difference of cooling water = 50 °C

Calorific value of petrol = 46,000 kJ/kg

(i) Calculate Indicated power and indicated mean effective pressure.

(ii) Draw heat balance sheet for the test in kJ/kg
