

17408

11920

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) List any two applications of two stroke petrol engine.
 - (ii) Define brake power.
 - (iii) State any two merits of vertical engine.
 - (iv) State functions of Carburettor.
 - (v) Write the name of parts used in two stroke engine.
 - (vi) State any two advantages of air cooling system.
 - (vii) State any four specifications of light motor vehicle engine.
 - (viii) Why speed of cam-shaft is half of crank shaft in four stroke engine ?
- (b) Attempt any TWO of the following : 08
- (i) Compare two stroke and four stroke engine.

- (ii) Classify I.C. engine on the basis of
 - (a) cycle of operation
 - (b) method of cooling
 - (c) fuel used
 - (d) method of charging
- (iii) Write the functions of connecting rod and flywheel.

2. Attempt any FOUR of the following :

16

- (a) Draw neat sketch of crank shaft for four cylinder engine and label it.
- (b) Compare dry liner and wet liner.
- (c) Name the manufacturing method for following :
 - (i) cylinder head
 - (ii) crank shaft
 - (iii) oil sump
 - (iv) cylinder liner
- (d) Draw valve timing dia. for four stroke S.I. engine.
- (e) Describe valve cooling with neat sketch.
- (f) Draw neat sketch of over head valve operating mechanism.

3. Attempt any FOUR of the following :

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- (a) Draw neat sketch of S.U. electrical pump.
- (b) Draw layout of common rail fuel system for diesel engine. Name the components.

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- (c) Explain working of simple carburettor.
- (d) List types of air cleaner and explain dry type air cleaner with neat sketch.
- (e) List types of muffler. Explain any one with suitable sketch.
- (f) Explain construction and working of fuel injector in C.I. engine.

4. Attempt any FOUR of the following :

16

- (a) Explain working of battery ignition system with neat sketch.
- (b) List different properties of coolant.
- (c) Explain electrically driven fan circuit with neat sketch.
- (d) State the function of water expansion tank. Explain with neat sketch the working principle of it.
- (e) Explain the working of S.I. engine.
- (f) List the requirements of ignition system used in S.I. engine.

5. Attempt any FOUR of the following :

16

- (a) List the dynamometer types. Describe working of any one.
- (b) Classify lubricating oil using viscosity (SAE) and load servicity (API) rating.
- (c) Draw neat sketch of gear type pump used in lubricating system and name the parts.
- (d) Explain any four additives used in oil.
- (e) State the need of P.C.V. system. Draw schematic dia. for the same.
- (f) Define swept volume and compression ratio.

P.T.O.

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

- (a) Write the procedure to conduct Morse test and Willian's line method to calculate F.P.
- (b) Write the procedure to calculate heat balance sheet for I.C. engine.
- (c) While performing Morse test on four stroke petrol engine, following results were obtained :

B.P. with all cylinders working = 32.2 kW

B.P. with cylinder no. 1 out off = 22.0 kW

B.P. with cylinder no. 2 out off = 21.8 kW

B.P. with cylinder no. 3 out off = 22.2 kW

B.P. with cylinder no. 4 out off = 22.8 kW

Calculate :

- (i) I.P. of the engine
- (ii) Mechanical efficiency
- (iii) Frictional power
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