

22440

24225

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.
  - (4) Use of Non-programmable Electronic Pocket Calculator is permissible.
  - (5) 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) List stages of combustion in C.I. engine.
- (b) Write conditions necessary for combustion.
- (c) State the function and location of
  - (i) Oxygen sensor
  - (ii) Throttle position sensor
- (d) State the advantages of electronic fuel injection system.
- (e) Compare LPG and CNG fuels on the basis of
  - (i) Calorific Value
  - (ii) Octane Rating
- (f) List the pollutants of diesel engine.
- (g) List the sources of pollutants from petrol engine.

2. Attempt any THREE of the following :

12

- (a) What are the effects of detonation ? Explain in brief.
- (b) Explain with neat sketch swirl combustion chamber.



- (c) State inputs and output control function of E.C.M.
- (d) What is Glow plug ? Why and where it is used ?

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

- (a) Write advantages and disadvantages of Electric car.
- (b) Draw a labelled block diagram of CNG conversion kit. Describe its working.
- (c) Compare V.G.T. with conventional turbo charger.
- (d) Explain the emission control system used to control NO<sub>x</sub> emission with neat sketch.

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

- (a) Distinguish between T.B.I. and P.F.I. system (4 points).
- (b) Explain LPG as alternative fuel for I.C. engines.
- (c) Explain leak detection procedure for gaseous fuel supply system.
- (d) List methods used to improve fuel economy.
- (e) Why and where catalytic converter is used ? Draw a neat sketch of 3-way catalytic converter.

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

- (a) Which combustion chamber is used in modern 100 cc bikes ? Justify your answer and draw the neat diagram for the same.
- (b) Draw a labelled sketch of ideal speed control system and explain its working.
- (c) Explain the working of CRDI system with neat schematic diagram.

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

- (a) Explain the working of fuel injector used in MPFI system with neat sketch.
  - (b) With the help of neat sketch, explain the working of high pressure pump used in CRDI system.
  - (c) Describe with neat sketch operation of PVC valve under any 2 different engine operating conditions to control emissions.
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