

17523

11819

3 Hours / 100 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. (A) Attempt any THREE : **12**

- (a) Draw neat sketches of any two types of SI engine combustion chambers.
- (b) State four advantages of MPFI engines.
- (c) Enlist any four major features of CRDI system.
- (d) Write the properties of diesel as a fuel in CI engines.

(B) Attempt any ONE : **6**

- (a) Discuss the drawbacks of carbureted SI engines on the basis of; Air-fuel ratio, fuel consumption, power output, emission.
- (b) Draw a layout of fuel injection system in CRDI diesel engines. State its fundamental requirements.

2. Attempt any FOUR :**16**

- (a) Explain the various stages of combustion in SI engines.
- (b) Explain the construction and working of Throttle Body Injection (TBI) system with neat sketch.
- (c) Enlist the measures of control detonation in SI engines.
- (d) Define delay period in CI engines. Explain factors affecting delay period.
- (e) Compare SI and CI engines on the basis of air-fuel ratio, power output, emission and knocking.
- (f) Explain the effect of spark advance and retardation on knocking.

3. Attempt any FOUR :**16**

- (a) Enlist any three methods of fuel injection. Discuss any one in detail.
- (b) Compare the carbureted engine fuel supply system with MPFI system.
- (c) What is ECM ? Explain how fuel injection is controlled using ECM.
- (d) Discuss causes and remedies for following faults in CI engines :
 - (i) Engine does not start or stalls just after starting.
 - (ii) Excessive fuel consumption.
- (e) Explain the working of diesel engine glow plugs with neat sketch.
- (f) Enlist advantages of CRDI system.

4. (A) Attempt any THREE : 12

- (a) Enlist the advantages and disadvantages of bio-diesel with respect to emission and performance.
- (b) Compare the following fuels on the basis of calorific value and knocking.
LPG, CNG and bio-diesel.
- (c) Discuss the advantages and limitations of electric vehicles.
- (d) What is GDI ? State its advantages.

(B) Attempt any ONE : 6

- (a) Explain the working of electronically controlled diesel injection pump.
- (b) Draw a neat sketch of LPG conversion kit and explain its working.

5. Attempt any TWO : 16

- (a) Explain the effect of following engine variables on ignition lag and flame propagation :
 - (i) Cylinder size
 - (ii) Cylinder wall temperature
 - (iii) Compression ratio and
 - (iv) Inlet air temperature
- (b) List the actuators used in MPFI system and explain working of any one.
- (c) Illustrate with neat sketch the process to control production of NO_x in combustion chamber.

6. Attempt any FOUR :**16**

- (a) Explain how VTEC is beneficial over VVT.
 - (b) Enlist various pollutants from gasoline engines. State their effect on environment.
 - (c) Explain any two engine modifications and two fuel modifications to control emission from gasoline engines.
 - (d) What is EGR ? Explain with the help of block diagram.
 - (e) Explain the effect of Positive Crankcase Ventilation (PCV) system on engine emission.
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