



17523

21415

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**.

MARKS

1. A) Attempt **any three** of the following : 12
- a) What is ignition lag ? State the factors affecting the same (four points).
 - b) List four drawbacks of carbureted S.I. engine.
 - c) State four features of CRDI system.
 - d) Describe four properties of diesel fuel.
- B) Attempt **any one** of the following : 6
- a) With the help of neat sketch explain the working of fuel injector used in MPFI system.
 - b) Explain the operation of glow plug with the help of circuit diagram.
2. Attempt **any four** of the following : 16
- a) Define pre-ignition and surface ignition.
 - b) State function and location of
 - i) Oxygen sensor
 - ii) Engine temperature sensor
 - iii) Air flow sensor
 - iv) Throttle position sensor.
 - c) Compare S.I. and C.I. engine on the basis of
 - i) Operating pressure
 - ii) Power output per unit weight
 - iii) Thermodynamic cycle
 - iv) Compression ratio.
 - d) With the help of P- θ diagram explain the stages of combustion in S.I. engine.
 - e) State the types of S.I. engine combustion chambers and give advantage of each.
 - f) State the effect of A/F ratio on power output of a C.I. engine with the help of graph.

P.T.O.



3. Attempt **any four** of the following : 16
- a) Explain idle speed control system as output function of ECM.
 - b) Describe construction and working of TBI system with suitable sketch.
 - c) MPFI system is beneficial fuel supply system over carbureted engine. Justify your answer.
 - d) What is glow plug ? Why and where it is used ?
 - e) Describe the working of high pressure fuel pump with neat sketch used in CRDI system.
 - f) Draw a labeled block diagram of EDC unit.
4. A) Attempt **any three** of the following : 12
- a) Draw a labeled block diagram of electric car and state two limitations.
 - b) List advantage and disadvantage of LPG (Two each).
 - c) CNG is used as a fuel for petrol vehicle. Justify your answer.
 - d) What is meant by VTEC ? State its two advantages.
- B) Attempt **any one** of the following : 6
- a) Describe the operation of CRDI system.
 - b) Explain the working of CNG conversion kit with a labeled block diagram.
5. Attempt **any two** of the following : 16
- a) Compare detonation and knocking with the help of P- θ diagram and give the methods to control both.
 - b) Illustrate the method to control NO_x with the help of neat sketch.
 - c) Illustrate the system to control evaporative emissions with a neat sketch.
6. Attempt **any four** of the following : 16
- a) How DTSI is beneficial over conventional ignition ?
 - b) What is meant by diesel smoke ? State two method to control the same.
 - c) Explain the working of PCV system with neat sketch.
 - d) Why and where catalytic convertor is used ? Give chemical reactions for the same.
 - e) List the methods to improve fuel economy.
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