

17523

16117

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) Assume suitable data, if necessary.

Marks

1. (A) Attempt any **THREE** of the following :

12

(a) Define 'Combustion'. State the three general conditions necessary for combustion.

(b) List the drawback of carburettor.

(c) List any four components used in CRDI system.

(d) State the need of hybrid vehicles. Write two advantages of the same.

(B) Attempt any **ONE** of the following :

06

(a) State three methods of fuel injection used in MPFI system. Describe any one.

(b) Draw a pressure-time diagram illustrating delay period. Describe Physical and Chemical delay.

2. Attempt any **FOUR** of the following :

16

(a) Describe any two variables affecting detonation.

(b) Compare carburetted engine fuel supply system with MPFI system (Give 4 pts).

- (c) Draw a neat labelled block diagram of CRDI system.
- (d) Compare S.I. and C.I. engine on the basis of
 - (i) Power output per unit weight
 - (ii) Acceleration
 - (iii) Fuel Economy
 - (iv) Reliability
- (e) Describe toroidal combustion chamber with neat sketch.
- (f) Draw a neat graph to indicate effect of speed on ignition delay in a C.I. engine.

3. Attempt any FOUR of the following :

16

- (a) With a neat sketch describe the construction of PFI system.
- (b) Draw a neat labelled diagram of fuel injector used in MPFI system.
- (c) Draw a neat block diagram indicating the inputs and outputs of ECM.
- (d) State any four advantages of CRDI system over conventional fuel injection system.
- (e) What is a Glow Plug ? Why and where it is used ?
- (f) State the function of high pressure pump and high pressure accumulator used in CRDI system.

4. (A) Attempt any THREE of the following :

12

- (a) State the need of Electric car. List two advantages and limitations of the same.
- (b) Draw a labelled block diagram of parallel type hybrid vehicle.
- (c) State with reasons whether alcohol can be used as an alternative fuel for C.I. engine.
- (d) Describe the concept of GDI with neat sketch.

(B) Attempt any ONE of the following : **06**

- (a) With the help of a neat sketch describe construction and working of High pressure pump used in CRDI system.
- (b) Draw a labelled block diagram of LPG conversion kit. Describe its working.

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

- (a) State four advantages of 'I'-head combustion chamber. Draw bath-tub type and wedge type combustion chambers.
- (b) Describe with sketch operation of PCV valve under different engine operating conditions to control emissions.
- (c) State four possible sources of atmospheric pollution from I.C. engine. Describe any two sources in detail.

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

- (a) How VGT is beneficial over conventional turbocharger ? (2 pts)
 - (b) Describe any two methods used for improving the exhaust emission under the engine design modification approach.
 - (c) Describe the working of EGR with neat sketch.
 - (d) Define Smoke. State two methods to control diesel smoke.
 - (e) State Bharat Stage IV norms for cars in India.
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