17523

**21718**

**3 Hours / 100 Marks** Seat No. | | | | | | | | |

***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) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

**1. (A) Attempt any THREE :** **3 × 4 = 12**

(a) Define : (i) Detonation, (ii) Pre-ignition.

(b) List two drawbacks of carburetted SI engine during fuel distribution and drivability.

(c) Differentiate Air fuel ratio between carburetted engine and electronic fuel injection engines control system.

(d) Write the values of boiling temp. for cetane (diesel), Iso-octane (petrol), Butane, Propane and Methane fuel and write effect of it on its systems.

**(B) Attempt any ONE :** **1 × 6 = 6**

(a) Draw neat sketch to show TBI system of SI engine and name the parts.

(b) Draw block diagram for CRDI engines and name the parts.

**2. Attempt any FOUR :** **4 × 4 = 16**

(a) List down the effects of detonation on SI engine.

(b) Why pressure regulator is required in fuel supply system of EFI system engines ?

(c) What is meant by surface ignition in SI engines ?

(d) Name the sensors which are placed at intake manifold, throttle valve, water jacket and exhaust manifold.

(e) Draw neat sketch of pre-combustion chamber and name the parts.

(f) Describe air fuel ratio requirements for diesel engines at no load to full load.

**3. Attempt any FOUR :** **4 × 4 = 16**

(a) Compare SI and CI engine on the basis of compression ratio and supercharging.

(b) Write the function of canister purge and EGR.

(c) Why fuel do not explode, even though fuel pump is fitted in the fuel tank itself ?

(d) Write the function of high pressure accumulator.

(e) Draw block diagram for EDC type fuel pump in diesel engine.

(f) Draw circuit diagram for diesel engine glow plug.

**4. (A) Attempt any THREE :** **4 × 3 = 12**

(a) Write the difference between LPG & CNG with respect to its calorific value, compression ratio, air fuel ratio and octane rating.

(b) Draw block diagram for LPG fuel supply system.

(c) Explain biodiesel fuel. Give any four applications.

(d) State the difference between turbo-charger and VGT used in diesel engine.

**(B) Attempt any ONE :** **1 × 6 = 6**

(a) List any four advantages of CRDI system and write its operation.

(b) Write about need and advantages of limitation in Hybrid vehicles.

**5. Attempt any TWO :** **2 × 8 = 16**

(a) Draw P – Q diagram for stages of combustion in SI engine and write stages of combustion with its explanation.

(b) Compare sequential, continuous, grouped and simultaneous methods of fuel injection.

(c) How the gasoline engine emission is controlled by engine design modification, and treatment of exhaust gas ?

**6. Attempt any FOUR :** **4 × 4 = 16**

(a) Explain VVT mechanism and state any two advantages of it.

(b) List any four parameters of improving fuel economy.

(c) List down the pollutants from gasoline engine and diesel engine.

(d) List out the methods for evaporation control and explain any one.

(e) Write the Bharat Stage Norms for cars which is manufacture in 2016.

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