314341

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

Marks

1.   **Attempt any <u>FIVE</u> of the following :**   **10**

a) Define ignition limit. State limits for hydrocarbon fuels.

b) Draw a neat sketch of following types of combustion chambers.

   i)   L - head type

   ii)   T - head type

c) State function of following sensors.

   i)   Oxygen sensor

   ii)   Mass Air flow sensor

d) State advantages of variable Geometric Turbocharger over conventional turbocharger in respect to

   i)   Power output

   ii)   Turbo lag

Marks

e) Define.

    i)   Brake power

    ii)   Indicated power

f) List any four methods of improving fuel economy.

g) State function of glow plug, Give two applications of glow plug.

2.   **Attempt any <u>THREE</u> of the following :**   **12**

a) CNG is used as a fuel for petrol vehicle, justify your answer.

b) Illustrate idle speed control as output control function of ECU.

c) Compare TBI and PFI system on the basis of

    i)   Types of injectors used

    ii)   Cost of system

    iii) Exhaust emission

    iv) Power output

d) Describe the concept of GDI.

3.   **Attempt any <u>THREE</u> of the following :**   **12**

a) Describe the procedure to locate leakage in CNG fuel supply system.

b) State location and function of two sensors and two actuators used in MPFI engine.

c) Describe operation of CRDI system.

d) Enlist various pollutants from the gasoline engine. State their effect on environment.

Marks

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

a) Describe the working of eddy current dynamometer with suitable sketch.

b) Explain VVT mechanism and state any two advantages of VVT mechanism.

c) Describe Willan's line method to measure friction power.

d) What is meant by diesel smoke? State two methods to control the smoke.

e) State Euro norms and Bharat stage norms for cars.

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

a) With the help of P - Ө diagram explain the stages of combustion in S.I. engine.

b) List and explain any three methods of petrol injection with suitable sketch.

c) Describe Exhaust gas recirculation (EGR) as output control function of ECU.

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

a) Compare variable Geometric Turbocharger with conventional turbocharger (Any six parameters.)

b) While performing Morse test on four cylinder petrol engine, the following result were obtained at particular throttle setting and speed

B.P. with all cylinders working = 32.2 kW

B.P. with cylinder no. 01 cut out = 22.0 kW

B.P. with cylinder no. 02 cut out = 21.8 kW

B.P. with cylinder no. 03 cut out = 22.2 kW

B.P. with cylinder no. 04 cut out = 22.8 kW

Determine I.P. of the engine and it's mechanical efficiency.

c) Describe any three engine modifications to be done to reduce S.I. engine emission.

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