314341

12526

3 Hours / 70 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. Attempt any FIVE of the following : **10**

a) State the general conditions necessary for combustion.

b) State ignition limits for S.I. engine and C.I. Engine.

c) State functions of –

i) Pressure regulator

ii) Electronic fuel injector in MPFI system.

d) State two limitations of conventional turbo charger.

e) Define :

i) Mechanical efficiency

ii) Brake power of I.C. engine.

f) List basic methods of controlling petrol engine emission.

g) List two features of CRDI engine.

P.T.O.

Marks

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

a) LPG is used as a fuel for petrol engine, justify your answer.

b) Illustrate with example of fuel injection as an output control function of ECM.

c) With neat sketch, describe multi port fuel injection system.

d) Describe features of Variable Valve Timing Mechanism (VVT).

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

a) Draw a neat sketch of CNG conversion kit and explain it's working.

b) State function and locations of –

i) Oxygen sensor

ii) Engine temperature sensor

iii) Mass Air Flow sensor

iv) Throttle position sensor

c) Describe the working of – high pressure fuel pump with neat sketch, used in CRDI system.

d) Explain with neat sketch working of EGR valve.

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

a) Describe the working of Hydraulic dynamometer with suitable sketch.

b) Compare conventional turbocharger with variable geometric turbocharger on the basis of –

i) Turbo lag

ii) Fuel efficiency

iii) Power output

iv) Engine responce

c) Explain Morse test for finding out frictional power.

d) State the pollutants from gasoline engine. Explain why it is formed.

Marks

e) Compare diesel and gasoline engine emission on the basis of –

i) Unburnt hydrocarbons

ii) Oxides of nitrogen

iii) Smoke

iv) Dilution of products of combustion

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

a) With the help of P–θ diagram explain stages of combustion in C.I. engine.

b) Draw block diagram of Electronic Diesel Control Unit (EDC). State the function of EDC.

c) Draw the circuit diagram of glow plug and explain it's operation.

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

a) Explain the concept of following with suitable sketch.

i) Startified charge injection

ii) Supercharger

b) An I.C. engine uses 6 Kg fuel having calorific value 44,000 KJ/Kg in one hour. The brake power developed is 18 KW. The temperature of 11.5 Kg of cooling water found to rise through 25°C per minute. The temperature of 4.2 Kg of exhaust gas with specific heat 1 KJ/KgK was found to rise through 220°C. Draw heat balance sheet for the engine.

c) Explain the working of Positive Crank Case Ventilation (PCV) valve with suitable sketch of any two positions.
