17523

15162

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

Marks

1. A) Attempt **any three** of the following : **12**

a) Define : Spark ignition, auto ignition, pre ignition and surface ignition.

b) List the engine variables, which affect on ignition lag and flame propagation.

c) What are the effects of detonation ?

d) What is meant by ignition limit for hydrocarbons in SI engines ?

B) Attempt **any one** : **6**

a) List the stages of combustion in SI engines and draw P-Q diagram.

b) Draw neat sketch of T-head combustion chamber.

2. Attempt **any four** : **16**

a) State four input and output control functions of ECM.

b) Explain the phenomenon of diesel knocking.

c) Describe the working of throttle body injection system.

d) Compare SI and CI engine on the basis of thermodynamic cycle and compression ratio.

e) Why diesel engines are fuel economical ?

f) What are the advantages of SI engines on the basis of cost, power to weight ratio, power to size ratio and starting condition ?

3. Attempt **any four** : **16**

a) Write comparison about fuel distribution between carburetted fuel system and electronic fuel injection system of SI engine.

b) Compare throttle body injection and port fuel injection of petrol engine.

c) List the methods of fuel injection used in EFI and explain any one.

P.T.O.

Marks

d) Write the function and location of IAT sensor, MAF sensor, O_2 sensor and ECT sensor.

e) Write the function of pressure regulator, injector, fuel pump and solenoid value used in SI engines.

f) Draw layout to show the function of canister purge unit in SI engine.

4. A) Attempt **any three**: **12**

a) What are the advantages of electronically controlled CRDI system over old common rail fuel injection pump system ?

b) Draw block diagram of electronically controlled fuel injection system.

c) What is glow plug ? Describe its working in diesel engines.

d) Draw neat sketch of electronic fuel injector.

B) Attempt **any one** : **6**

a) Draw neat sketch to show EGR system and name it.

b) Draw neat sketch of low pressure pump (feed pump) of diesel engines.

5. Attempt **any four**: **16**

a) Compare properties of fuel as ignition temp and calorific value for the fuels petrol, LPG, and CHG.

b) Draw layout to show fuel supply of LPG as alternative fuel to SI engine.

c) What are the advantages of CHG fuel system ?

d) What are the limitation of LPG as alternative fuel ?

e) Draw block diagram for hybrid vehicle.

f) Write the working of an electric car.

6. Attempt **any four**: **16**

a) What are the advantages of Variable Geometric Turbocharger (VGT) over old turbocharger ?

b) Compare Over Head Value (OHV) mechanism and Variable Value Timing (VVT) mechanism.

c) Why DTSI system is used in engines ?

d) List the methods/system used to improve fuel economy of SI engines.

e) List the pollutants of gasoline engines with their source and reason.

f) What is meant by PCV and draw simple figure for it ?
