17408

16172

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

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 six** : **12**

a) Define stroke.
b) State any two demerits of horizontal I.C. engine.
c) List any two applications of two stroke petrol engine.
d) State any four specifications of two wheeler.
e) State any two advantages of water cooling system.
f) Define brake thermal efficiency and volumetric efficiency.
g) State function of piston and compression ring.
h) State function of carburetor.

B) Attempt **any two** : **8**

a) Compare two stroke and four stroke engine.
b) Classify I.C. engine on the basis of :
   1) Cooling
   2) Cylinder arrangement
   3) Camshaft layout
   4) Fuel.
c) List the different efficiencies of an engine and write down the relation between them.

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

a) Draw a labelled sketch showing engine nomenclature.
b) Draw a labelled sketch of piston and specify material used for manufacturing it.
c) Differentiate between dry and wet liners.
d) Name manufacturing method for following.
   1) Cylinder block
   2) Cylinder head
   3) Crank shaft
   4) Oil sump.
e) Draw value timing diagram for 4 stroke C.I. engine.
f) Compare Crankshaft and Camshaft any four points.

P.T.O.

Marks

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

a) List various value operating mechanism and explain any one.

b) List any four needs and requirements of fuel injection system and explain.

c) Explain construction and working of fuel injector in C.I. engine.

d) Draw layout of inline type individual pump fuel injection system.

e) List type of air cleaners and explain dry type air cleaner with suitable sketch.

f) Draw layout of common rail common rail fuel supply system.

4. Attempt **any four** : **16**

a) Explain working of Magneto ignition system with suitable sketch.

b) List types of muffler and explain any one with suitable sketch.

c) Compare battery and magneto ignition system.

d) Explain electrically driven fan circuit with suitable sketch.

e) Overcooling and undercooling of engine is not desirable, explain why ?

f) Explain construction and working of pressure cap used in cooling system.

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

a) Draw neat labelled sketch of dry sump lubrication system. For multi cylinder engine and describe its working.

b) Draw a labelled sketch of pressure feed lubrication system.

c) Classify lubricating oils using viscosity (SAE) and load severity (API) rating.

d) Draw a labelled sketch of pump feed fuel supply system and state location of each component.

e) List methods to find out frictional power and explain Williams Line Method in brief.

f) List types of dynamometers used in engine testing and explain rope brake dynamometer.

6. Attempt **any two** : **16**

a) How you will calculate the indicated power of four cylinder petrol engine by Morse test.

b) Following readings were noted during a test on a single cylinder of two stroke petrol engine. Engine is motored by a electric motor and frictional power recorded on wattmeter is 1.5 KW.

Net brake load = 2.0 N

Dia of brake wheel = 110 cm

Engine speed = 595 rpm

Fuel consumption = 2.01 Kg/hr.

Calorific value of fuel = 44,000 KJ/kg

Find mechanical efficiency and brake thermal efficiency.

c) An I.C. engine uses 6 Kg of 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 was found to rise through 25°C per min. The temperature of 4.2 Kg of exhaust gas with specific heat 1KJ/Kg K was found to rise through 220°C. Draw heat balance sheet for the engine.
