Scheme – I

Sample Question Paper

Program Name : **Diploma in Automobile Engineering**
Program Code : **AE**
Semester : **Third**
Course Title : **Automobile Engines**
Marks : **70**

22308

Time: 3 Hrs.

Instructions:

(1) All questions are compulsory.
(2) Illustrate your answers with sketches wherever necessary.
(3) Figures to the right indicate full marks.
(4) Assume suitable data if necessary.
(5) Preferably, write the answers in sequential order.

Q.1) Attempt any FIVE of the following. **10 Marks**

a) Define the terms: Swept volume and compression ratio
b) List four systems used in I.C. engine
c) Locate the position of following components in an I.C. engine: Crank shaft, Camshaft, Piston, and Circlip.
d) State four type of injector nozzles.
e) List four functions of exhaust system.
f) State any four rotating components of I.C. engine to be lubricated.
g) Define Brake power and Indicated Power.

Q.2) Attempt any THREE of the following. **12 Marks**

a) Compare S.I. and C.I. engines on the basis of: compression ratio, thermal efficiency, mechanical efficiency and application.
b) Compare overhead valve and overhead cam arrangement on the basis of: emission, number of parts, Power output and efficiency.
c) Elaborate the working of S.U. electrical fuel feed pump with help of sketch.
d) Describe the working of pressurized water cooling system with help of schematic diagram.

Q.3) Attempt any THREE of the following. **12 Marks**

a) Describe the working principle of Four-stroke petrol engine with help of sketches.
b) Describe the construction of piston of a four-stroke engine with sketch.
c) Explain the working of magneto ignition system with sketch.
d) Sketch high voltage connections between distributor and spark plugs of multi-cylinder engine with direction of rotation of distributor shaft/ rotor assembly. Label the sketch.

Q.4) Attempt any THREE of the following. **12 Marks**

a) Select I.C. engine for transport application with justification.

b) Draw valve operating mechanism of Overhead valve arrangement and explain the same.

c) Select muffler for a motorcycle engine with justification.

d) Describe the construction and working of water expansion tank with help of sketch.

e) In a test on a 2- stroke single cylinder diesel engine, following observations were made: Bore -75mm, Stroke -90mm, Engine speed =1200rpm, Mean effective pressure = 12 bar, Mean brake Diameter = 0.5 m, Net Brake load= 200 N, Fuel consumption = 2.04kg/hr, Calorific value of diesel =42000 kJ/kg.

Calculate –

i) Mechanical efficiency

ii) Brake thermal efficiency

Q.5) Attempt any TWO of the following. **12 Marks**

a) Choose valve operating system for-(i) Front Engine Front Wheel Drive arrangement of a vehicle and (ii) Front Engine rear wheel drive arrangement of a vehicle – with justification.

b) Elaborate the working of Two-wheeler carburetor with help of a sketch.

c) Statement: Racing car engines have Dry sump lubrication system. Justify the statement by giving reasons for use of dry sump lubrication system in racing car. Sketch the lubrication system.

Q.6) Attempt any TWO of the following. **12 Marks**

a) Describe the Morse test procedure for multi-cylinder I.C. engine.

b) Select lubricant with justification for – i) Four-stroke S.I. engine , ii) Four stroke C.I. engine, from given list of lubricants.

Sr. No.	Lubricant category/ Grade
1	SAE 20 W40
2	SN
3	CJ-4
4	CF-4

c) In a trial on a four cylinder engine 100 mm bore, 150 mm stroke and working on a four stroke cycle. The following observations were made:

Speed = 2500 rpm

Net Dynamometer load at 50mm radius = 200N

Power required to rotate with Ignition off= 45KW

Petrol consumption = 752 g/minute

Cooling water circulated = 200 g/minute

Temperature size of cooling water=50º C

Calorific valve of petrol =46,000 KJ/Kg

i) Calculate mechanical efficiency and indicated mean effective pressure.

ii) Draw heat balance sheet for the test in KJ/Kg.

Scheme – I

Sample Test Paper - I

Program Name : **Automobile Engineering Program**
Program Code : **AE**
Semester : **Third**
Course Title : **Automobile Engines**
Marks : **20**

22308

Time: 1 Hour

Instructions:

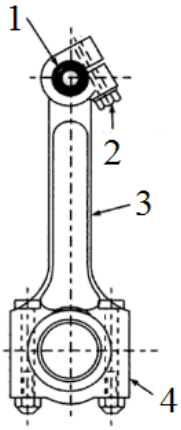
(1) All questions are compulsory.
(2) Illustrate your answers with neat sketches wherever necessary.
(3) Figures to the right indicate full marks.
(4) Assume suitable data if necessary.
(5) Preferably, write the answers in sequential order.

Q.1) Attempt any FOUR of the following. **08 Marks**

a) Classify I. C. engines on the basis of cylinder arrangement and method of charging.
b) Draw a labeled sketch of the piston of four stroke engine.
c) Explain the reason for driving camshaft at half of engine crank shaft speed.
d) Describe function of induction system of Diesel engine.
e) State the air: fuel ratio for following conditions of S.I. engine operation: Cold Start, Idling, part throttle and acceleration.
f) Define the terms: Clearance volume and Bottom dead center.

Q.2) Attempt any THREE of the following. **12 Marks**

a) Describe construction of Cylinder head with help of sketch.
b) Describe valve timing diagram for four stroke C.I. engine with sketch.
c) Elaborate the working of Starting circuit of Two-wheeler carburetor with help of a sketch.
d) Describe function of any four components of Fuel Injection pump.
e) State the specifications of I.C. engine used in a Two- wheeled vehicle.
f) Identify the given I.C. engine component, redraw and write four labels as per numbers in the figure.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Scheme – I

Sample Test Paper - II

Program Name : **Automobile Engineering Program**
Program Code : **AE**
Semester : **Third**
Course Title : **Automobile Engines**
Marks : **20**

22308

Time: 1 Hour

Instructions:

(1) All questions are compulsory.
(2) Illustrate your answers with sketches wherever necessary.
(3) Figures to the right indicate full marks.
(4) Assume suitable data if necessary.
(5) Preferably, write the answers in sequential order.

Q.1) Attempt any FOUR of the following. **08 Marks**

a) State the firing orders of 3 and 4 cylinder engine.
b) State the function of Ignition coil and condenser.
c) List four additives of Engine oil.
d) State the necessity of I.C. engine cooling system.
e) Define Indicated thermal efficiency and Brake thermal efficiency.
f) List four functions of I.C. engine exhaust system.

Q.2) Attempt any THREE of the following. **12 Marks**

a) Differentiate between battery ignition and magneto ignition system on the basis of – Intensity of spark at low speed, space occupied, application and maintenance.
b) State four types exhaust system muffler and explain one type with sketch.
c) Describe the working of air cooling system with sketch.
d) Describe the working of electrically operated fan with help of circuit diagram.
e) Describe Willian's Line method for finding Frictional power of an I.C. Engine.
f) An I.C. engine uses 6 kg fuel having calorific value 44000 KJ/kg in one hour. The brake power developed is 18kW. The temperature of 11.5 kg of cooling water found to rise through 50º C per minute.
Calculate- Heat input, heat converted to BP and heat lost in cooling system.