

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER- VI(NEW) – EXAMINATION – SUMMER 2019****Subject Code: 2161902****Date:14/05/2019****Subject Name: Internal Combustion Engines****Time: 10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

MARKS

- Q.1** (a) Describe Valve timing Diagram for Actual working of low speed CI engine. **03**
- (b) Describe the working of four stroke SI engine with illustrative line diagrams. **04**
- (c) Draw a neat sketch of a typical C.I. Engine and mention the functions of each principle components of engine. **07**

- Q.2** (a) Define Volumetric Efficiency. What is the importance of determining Volumetric Efficiency? **03**
- (b) Discuss the difference between actual Otto cycle Engine and diesel cycle engine. **04**
- (c) What are the effects of variable specific heats on Otto cycle and Diesel Cycle? **07**

OR

- (c) Write a short note on effect of time loss, heat loss and exhaust loss in Petrol and Diesel engines **07**
- Q.3** (a) What is the function of Calorimeters? List the calorimeters used in practice. **03**
- (b) Draw and explain the working of simple carburetor and mention its fundamental fault. **04**
- (c) Discuss various mixture requirement for different loads and speeds **07**

OR

- Q.3** (a) Write the definitions/meaning of Octane numbers and cetane numbers referred to IC Engine fuels. **03**
- (b) Write a short note on MPFI. **04**
- (c) Discuss the fuel supply systems in Diesel Engine and mention the merits and demerits of each. **07**

- Q.4 (a) Classify typical Governing Systems. 03
 (b) What are possible firing order in four cylinder and six cylinder engine? 04
 Why the firing order is determined in a multicylinder engine?
 (c) Discuss the typical differences of liquid cooling system and air cooling 07
 system. State the suitable situation in which they can be used.

OR

- Q.4 (a) What is the need for supercharging? 03
 (b) Write a short note on Euro I to VI norms. 04
 (c) Write a short note on Battery and magneto ignition system. 07
- Q.5 (a) List the desired properties of a coolant. 03
 (b) Discuss heat release pattern in a CI engine with p-θ diagram. 04
 (c) A Gas engine working on the constant volume cycle gave the following 07
 results during one hour test.
 Cylinder Diameter 24 cm, stroke 48 cm, effective diameter of break wheel
 1.25 cm. Net load on break 1236 N; average speed 226.7 r.p.m.; average
 expansions per minute 77; m.e.p is 7.5 bar, gas used is 12.5 m³ at 15°C and
 771 mm of mercury pressure. C.V. of fuel is 22000 kJ/m³ at NTP. Cooling
 water used 625 kg, inlet temperature was 25°C and outlet temperature was
 60°C. Determine:
 a) The mechanical Efficiency
 b) The indicated thermal Efficiency
 c) Draw up a heat balance sheet on minute basis.
 Answer, Why the friction power is not included in Heat balance sheet?

OR

- Q.5 (a) Write the merit and demerits of diesel engine power plants 03
 (b) What is meant by abnormal combustion? Explain the phenomena of knock in 04
 SI engine.
 (c) Discuss the method to determine friction loss for a multicylinder Internal 07
 Combustion Engine.
