

Seat No.: _____

Enrolment No. _____

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 auto 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 system. State the suitable situation in which they can be used. **07**

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 results during one hour test. **07**

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 SI engine. **04**
- (c)** Discuss the method to determine friction loss for a multicylinder Internal Combustion Engine. **07**
