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? Why the firing order is determined in a multicylinder engine? **04**

(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 m^3 at 15^oC and 771 mm of mercury pressure. C.V. of fuel is 22000 kJ/m^3 at NTP. Cooling water used 625 kg, inlet temperature was 25^oC and outlet temperature was 60^oC. 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**

****