Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – WINTER 2023

Subject Code:2161902 Date:05-12-2023

Subject Name:Internal Combustion Engines

Time:02:30 PM TO 05:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	State the function served by IC engine components (i) cylinder head (ii) piston rings (iii) flywheel	**03**
	(b)	State the assumptions for fuel-air cycle analysis.	**04**
	(c)	Explain stages of combustion in CI engine.	**07**
Q.2	**(a)**	Explain knocking in short.	**03**
	(b)	Compare battery ignition system with magneto ignition system	**04**
	(c)	Explain construction and working of bomb calorimeter with figure.	**07**
		OR	
	(c)	Explain about enthalpy of reaction, adiabatic flame temperature and enthalpy of formation	**07**
Q.3	**(a)**	What are the limitations of supercharging for SI engines?	**03**
	(b)	Compare battery ignition system with magneto ignition system	**04**
	(c)	Explain T-head, L-head and I-head combustion chambers used for SI engines	**07**
		OR	
Q.3	**(a)**	What are the objectives of supercharging?	**03**
	(b)	Derive equation for isentropic expansion with variable specific heat.	**04**
	(c)	Write short note on firing order of cylinders.	**07**
Q.4	**(a)**	Derive the equation for variation of efficiency of Otto cycle on account of variable specific heat.	**03**
	(b)	Explain the lubrication of crankshaft bearings.	**04**
	(c)	Explain Morse test for measurement of IP of multi-cylinder engines.	**07**
		OR	
Q.4	**(a)**	State advantages of water cooling system.	**03**
	(b)	What are the various desired properties of a lubricant?	**04**
	(c)	Explain precombustion chambers with its merits.	**07**
Q.5	**(a)**	Define Octane and Cetane number rating.	**03**
	(b)	Write a short note on air pollution due to IC engines	**04**
	(c)	Discuss various mixture requirements for different loads and speeds	**07**
		OR	
Q.5	**(a)**	Give various applications of diesel engines in power field.	**03**
	(b)	Explain working of pintle nozzle with figure.	**04**
	(c)	Explain construction and working of simple carburetor with neat sketch	**07**