Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–VII (NEW) EXAMINATION – WINTER 2024

Subject Code:3170215 Date:30-11-2024

Subject Name: Advance Combustion Technology of I.C. Engine

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.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	What is turbo-charging? What is the advantage of turbo-charging in SI engine?	**03**
	(b)	Draw the Schematic diagram of SCR treatment.	**04**
	(c)	Explain working of Direct Injection Gasoline Engine with schematic diagram.	**07**
Q.2	**(a)**	Write short notes on exhaust emission.	**03**
	(b)	Describe future trend Stratified Charged Gasoline Engine.	**04**
	(c)	What are different types nozzle used for spray formation? Write comparison of nozzles.	**07**
		OR	
	(c)	Write disadvantages of wall guided direction injection system.	**07**
Q.3	**(a)**	Write a short note on P-HCCI engine.	**03**
	(b)	What is auto ignition phenomenon? What is the basic difference between auto ignition combustion and SI combustion?	**04**
	(c)	Which are the primary objectives of gasoline HCCI engine and Diesel HCCI Engine?	**07**
		OR	
Q.3	**(a)**	Explain in brief concept of lean boost combustion system.	**03**
	(b)	Explain EGR with the neat sketch	**04**
	(c)	Describe the fundamental principle of HCCI combustion in gasoline engines.	**07**
Q.4	**(a)**	Differentiate turbo charging and super charging.	**03**
	(b)	What is Turbo Lag in Turbocharging?	**04**
	(c)	Enlist the problems associated with stratified charge lean-burn mixture in a DI gasoline engine.	**07**
		OR	
Q.4	**(a)**	Mention the advantages of direct injection system	**03**
	(b)	Explain factors which increase NOx production in CI engine.	**04**
	(c)	Explain the effect of fuel injection timing on auto ignition combustion.	**07**
Q.5	**(a)**	Compare multi point fuel injection and gasoline direct injection system.	**03**
	(b)	Explain operational limitation of HCCI combustion.	**04**
	(c)	Write the Stages of Combustion processes in SI Engine with Proper Diagram.	**07**
		OR	
Q.5	**(a)**	Define Ignition lag in brief.	**03**
	(b)	Explain the following: (a) LNT (b) Emission Control Devices.	**04**
	(c)	Define term Downsizing. Explain any one method of downsizing.	**07**

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