

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VII EXAMINATION – SUMMER 2025

Subject Code:3170215

Date:16-05-2025

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

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) Explain Normal and Abnormal combustion in SI Engine.	03
	(b) Draw different type of combustion chamber for CI engines and explore in details.	04
	(c) Write the Stages of Combustion processes in CI Engine with proper Diagram.	07
Q.2	(a) Write a short note on stratified charged Engine.	03
	(b) Explain Exhaust Emission according to Gasoline Engine	04
	(c) Define term Downsizing. Explain any one method of downsizing.	07
	OR	
	(c) Write a short note on CRDI Engine.	07
Q.3	(a) Explain in brief concept of lean boost combustion system.	03
	(b) Write short notes on fuel consumption as per Stratified Charged engine.	04
	(c) What are different types nozzle used for spray formation? Write comparison of nozzles.	07
	OR	
Q.3	(a) What is stratified charge operation in case of gasoline direct injection?	03
	(b) Explain the following: (a) SCR (b) Emission Control Devices.	04
	(c) Explain the wall, air and spray combustion system for the implementation of mixture preparation of gasoline direct injection.	07
Q.4	(a) What is turbo-charging? What is the advantage of turbo-charging in SI engine?	03
	(b) Explain EGR with the neat sketch.	04
	(c) Differentiate Turbo charging and Supercharging..	07
	OR	
Q.4	(a) Explain Engine Knocking phenomenon	03
	(b) What are the problems associated with turbo charging the spark-ignition engine Explain any two of the problems in detail.	04
	(c) What the advantages are of turbocharge in GDI engine by combining direct injection.	07
Q.5	(a) Give a brief detail on emission occur in HCCI engine.	03
	(b) Describe any one approach to HCCI operation in gasoline engines.	04
	(c) Which are the primary objectives of gasoline HCCI engine and Diesel HCCI Engine?	07
	OR	
Q.5	(a) What are the problem or challenges facing CAI/HCCI combustion in the Gasoline	03
	(b) Write a short note on HCCI diesel engine.	04
	(c) Explain operational limitation of HCCI combustion	07
