

Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-VII EXAMINATION – WINTER 2025

Subject Code:3170215

Date:20-11-2025

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) Differentiate Turbo charging and Supercharging.	03
(b) What is engine downsizing?	04
(c) Explain the Principle of Auto ignition combustion in the gasoline engine.	07
Q.2 (a) Compare multi point fuel injection and gasoline direct injection system.	03
(b) Explain EGR with the neat sketch.	04
(c) Describe how the selective catalytic reduction (SCR) NOx control as an alternative to lean NOx traps (LNT).	07
OR	
(c) What are the problem or challenges facing CAI/HCCI combustion in the gasoline engine?	07
Q.3 (a) Give advantage of HCCI engine.	03
(b) What is lean boost direct injection (LB DI) concept?	04
(c) Explain different types of direct injection gasoline injectors.	07
OR	
Q.3 (a) Write short notes on engine knock.	03
(b) Define Ignition lag in brief.	04
(c) Explain turbocharged direct injection (TDI) with schematic diagram.	07
Q.4 (a) Explain tail pipe emission formed by combustion of gasoline in brief.	03
(b) Draw the Schematic diagram of SCR treatment.	04
(c) Write short note on: (a) Wall Guided (b) Air Guided (c) Spray Guided Combustion System.	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 thermodynamic and combustion process of Stratified charge engine.	07
Q.5 (a) What is Turbo Lag in Turbo charging?	03
(b) Explain operational limitation of HCCI combustion.	04
(c) Explain concept and technology variable valve timing (VVT) in details. Also give advantages of it.	07
OR	
Q.5 (a) Write a short note on GDI Engine.	03
(b) Write a short note on HCCI diesel engine.	04
(c) Write the Stages of Combustion processes in CI Engine with Proper Diagram.	07
