

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 (LBDI) 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**
