

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2023****Subject Code:3170215****Date:08-12-2023****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**

<b>Q.1</b>	(a) Write a short note on GDI Engine	<b>03</b>
	(b) Describe future trend Stratified Charged Gasoline Engine	<b>04</b>
	(c) What are the after treatments Devices? Explain their types	<b>07</b>
<b>Q.2</b>	(a) What is the effect of Turbocharging on SI engine Emission?	<b>03</b>
	(b) Explain EGR with the neat sketch	<b>04</b>
	(c) Write the Stages of Combustion processes in CI Engine with Proper Diagram	<b>07</b>
	<b>OR</b>	
	(c) Write short note on: (a) Wall Guided (b) Air Guided (c) Spray Guided Combustion System	<b>07</b>
<b>Q.3</b>	(a) Explain high pressure fuel injection system	<b>03</b>
	(b) Explain technologies for high efficiency direct injection gasoline engine.	<b>04</b>
	(c) What are advantages of combining direct injection and turbocharging in spark ignition engines,	<b>07</b>
	<b>OR</b>	
<b>Q.3</b>	(a) Explain Lean NOX Trap	<b>03</b>
	(b) Differentiate Turbo charging and Supercharging	<b>04</b>
	(c) Explain thermodynamic and combustion process of Stratified charge engine	<b>07</b>
<b>Q.4</b>	(a) What is lean boost direct injection (LBDI) concept?	<b>03</b>
	(b) What is exhaust gas treatment in Stratified charge engine?	<b>04</b>
	(c) Explain factor affecting combustion in multiple injection	<b>07</b>
	<b>OR</b>	
<b>Q.4</b>	(a) Explain Engine Knocking phenomenon	<b>03</b>
	(b) Compare MPFI with gasoline direct injection system.	<b>04</b>
	(c) Explain the Principle of Auto ignition combustion in the gasoline engine.	<b>07</b>
<b>Q.5</b>	(a) Explain operational limitation of HCCI combustion	<b>03</b>
	(b) Explain the following in MPFI: (a) rate control (b) late fuel injection	<b>04</b>
	(c) Explain problems and challenges associated with turbocharging spark ignition engines	<b>07</b>
	<b>OR</b>	
<b>Q.5</b>	(a) Explain emissions control in HCCI engine	<b>03</b>
	(b) What are the problems or challenges facing CAI/HCCI combustion in the gasoline engine?	<b>04</b>
	(c) Which are the primary objectives of gasoline HCCI engine and Diesel HCCI Engine?	<b>07</b>

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