Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII (NEW) EXAMINATION – SUMMER 2022

Subject Code:2180215 Date:02/06/2022

Subject Name:Automotive and Combustion Engine Technology

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 engine downsizing?	**03**
	(b)	Enlist strategy for emission control in gasoline and diesel fueled vehicle	**04**
	(c)	What is turbo charging?	**07**
Q.2	**(a)**	Explain thermal management approach to achieving auto ignition.	**03**
	(b)	How is stratified charge combustion achieved?	**04**
	(c)	What are the types of nozzle used in gasoline direct injection? Also explain their constructional features.	**07**
		OR	
	(c)	Explain the wall, air and spray combustion system for the implementation of mixture preparation of gasoline direct injection	**07**
Q.3	**(a)**	Explain EGR with the neat sketch.	**03**
	(b)	Explain the following: (a) Lean NOx trap (b) Emission control devices	**04**
	(c)	Explain the thermodynamic aspects of gasoline direct injection and describe the combustion processes	**07**
		OR	
Q.3	**(a)**	Write short notes on engine knock.	**03**
	(b)	Describe Thermal loading and Turbo lag in context of gasoline engine with turbo charging	**04**
	(c)	Explain the reasons for knocking and abnormal combustion with turbocharging in SI engine?	**07**
Q.4	**(a)**	Draw the Schematic diagram of SCR treatment.	**03**
	(b)	What is auto ignition phenomenon?	**04**
	(c)	What are the advantages of combining direct injection and turbo charging in spark-ignition engine?	**07**
		OR	
Q.4	**(a)**	What are the advantages of lean boost direct injection (LBDI) concept?	**03**
	(b)	Enlist the limitation of HCCI combustion	**04**
	(c)	Describe how the selective catalytic reduction (SCR) NOx control as an alternative to lean NOx traps (LNT).	**07**
Q.5	**(a)**	Write short notes on exhaust gas treatment on fuel economy.	**03**
	(b)	Draw a diagram of a typical DI gasoline engine with sensors and control	**04**
	(c)	Explain stages of combustion of HCCI engine.	**07**
		OR	
Q.5	**(a)**	Explain exhaust gas treatment	**03**
	(b)	Mention the advantages of direct injection system	**04**
	(c)	Explain the effect of fuel injection timing on combustion	**07**

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