Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII (NEW) EXAMINATION – WINTER 2018

Subject Code: 2180210/2180215 **Date: 19/11/2018**

Subject Name: Automptive And Combustion Engine Technology

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.**

Q.1	**(a)**	What is engine downsizing?	**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**
Q.2	**(a)**	What is lean boost direct injection (LBDI) concept?	**03**
	(b)	Explain Lean NOx trap	**04**
	(c)	What are the problems associated with turbo charging the spark-ignition engine? Explain any two of the problems in detail.	**07**
		OR	
	(c)	Describe the three combustion concepts (wall, air and spray) for the implementation of mixture preparation of gasoline direct injection	**07**
Q.3	**(a)**	Write short notes on exhaust emission.	**03**
	(b)	Explain the salient features of the first-generation	**04**
	(c)	Describe the different approaches to HCCI operation in gasoline engines?	**07**
		OR	
Q.3	**(a)**	Write short notes on exhaust gas treatment on fuel economy.	**03**
	(b)	Explain the salient features of the second-generation	**04**
	(c)	With a neat sketch explain thermodynamic analysis of gasoline direct injection at part-load condition.	**07**
Q.4	**(a)**	Write short notes on engine knock	**03**
	(b)	Mention the advantages of direct injection system.	**04**
	(c)	Describe how the selective catalytic reduction (SCR) NOx control as an alternative to lean NOx traps (LNT).	**07**
		OR	
Q.4	**(a)**	Draw a diagram of a typical DI gasoline engine with sensors and control	**03**
	(b)	Explain the conventional diesel combustion with a neat sketch.	**04**
	(c)	Explain the principle of autoignition combustion in the gasoline engine.	**07**
Q.5	**(a)**	What is turbo charging?	**03**
	(b)	With a neat sketch explain the process of turbo charging?	**04**
	(c)	Describe the different approaches to HCCI operation in gasoline engines?	**07**
		OR	
Q.5	**(a)**	Explain the thermodynamic aspects of gasoline direct injection	**03**
	(b)	Differentiate turbo charging and super charging.	**04**
	(c)	Describe the fundamental principle of HCCI combustion in gasoline engines.	**07**

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