Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–VIII (NEW) EXAMINATION – WINTER 2020

Subject Code:2180215 **Date:21/01/2021**

Subject Name:Automotive And Combustion Engine Technology

Time:02:00 PM TO 04:00 PM **Total Marks: 56**

Instructions:

1. **Attempt any FOUR questions out of EIGHT questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			MARKS
Q.1	**(a)**	What is Automobile? What is Engine?	**03**
	(b)	Explain different types of Nozzles used in Diesel engine.	**04**
	(c)	Define: Engine downsizing. Explain the methods to achieve downsizing.	**07**
Q.2	**(a)**	Define : Atkinson cycle and Miller cycle.	**03**
	(b)	Explain EGR with the neat sketch.	**04**
	(c)	With a neat sketch explain thermodynamic analysis of gasoline direct injection at part-load condition.	**07**
Q.3	**(a)**	What is turbo charging? Advantage of turbo charging in SI engine.	**03**
	(b)	What is stratified charge operation in case of gasoline direct injection?	**04**
	(c)	Explain the wall, air and spray combustion system for the mixture preparation of gasoline direct injection.	**07**
Q.4	**(a)**	What is Hybrid vehicle?	**03**
	(b)	Write the advantages of gasoline direct injection in terms of efficiency in a real engine.	**04**
	(c)	What is auto ignition phenomenon? What is the basic difference between auto ignition combustion and SI combustion?	**07**
Q.5	**(a)**	Enlist the limitation of HCCI combustion.	**03**
	(b)	Compare emissions with HCCI and CI engine operation.	**04**
	(c)	Explain stages of combustion of HCCI engine.	**07**
Q.6	**(a)**	Give the difference between turbo charging and supercharging.	**03**
	(b)	Name the different types of supercharger. Explain any one of them.	**04**
	(c)	Describe the purpose of supercharging and also explain with thermodynamic cycles with supercharging.	**07**
Q.7	**(a)**	Explain basic principle of HCCI combustion.	**03**
	(b)	Enlist the controlling parameters for HCCI combustion for best fuel economy and low emissions in SI engine.	**04**
	(c)	Comparison of knocking in S.I. and C.I. engine.	**07**
Q.8	**(a)**	What is internal exhaust gas recirculation system and external exhaust gas recirculation system?	**03**
	(b)	Which are the modifications required to change from SI combustion to auto ignition combustion?	**04**
	(c)	What are the approaches to auto ignition combustion operation in gasoline engines? Explain any two in detail.	**07**