Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:3150210 Date:03/02/2021

Subject Name:Automobile Engines

Time:10:30 AM TO 12:30 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.**

Q.1	**(a)**	Define (1) Swept volume with SI Unit (2) Clearance Volume with SI Unit (3) Compression ratio with expression	**03**
	(b)	Describe factors influencing firing order of SI engine.	**04**
	(c)	Explain valve timing diagram of SI and CI 4-stroke engine with neat.	**07**
Q.2	**(a)**	Give assumptions are made for analysis of single jet carburetor.	**03**
	(b)	Explain in brief working principle of venture in context to carburetor.	**04**
	(c)	Explain A/F ratio in various operation ranges of carburetor for SI engine during transient operation.	**07**
Q.3	**(a)**	Give objectives of injection system of CI engine.	**03**
	(b)	Explain terms atomization and turbulence in context to CI engine injection system.	**04**
	(c)	Give type of solid injection system. Explain common rail injection system with suitable sketch.	**07**
Q.4	**(a)**	Describe in brief knocking phenomenon.	**03**
	(b)	Explain the role of Ethylene glycol in the coolant.	**04**
	(c)	Describe with neat sketch water cooling system with thermostat valve.	**07**
Q.5	**(a)**	Give the function of lubrication system.	**03**
	(b)	Explain parameters viscosity, pour point, oxidation stability, oiliness in context to lubricating oil.	**04**
	(c)	A single cylinder 4 stroke cycle oil engine works on diesel. The following reading were taken when the engine was running at full load Mean effective pressure = 7.5 bar Speed of the engine = 400 rpm Brake Power = 8 kj/s Fuel consumption= 2.8 kg/hr Calorific value of fuel = 42000 kj/kg Diameter of the cylinder = 16 cm Stroke length = 20 cm Estimate: Friction power, Mechanical efficiency, Brake thermal efficiency, Brake mean effective pressure.	**07**
Q.6	**(a)**	What is scavenging?	**03**
	(b)	Describe concept of supercharging.	**04**

	(c)	Differentiate between Mist and Pressure feed lubrication system.	**07**
Q.7	**(a)**	What is valve overlapping? Give significance of it.	**03**
	(b)	Compare brake power, friction power and indicated power of an IC engine.	**04**
	(c)	Explain combustion phenomenon of SI using pressure-theta (Crank angle) diagram with stages.	**07**
Q.8	**(a)**	Define (1) Volumetric efficiency with expression (2) Friction power with SI Unit	**03**
	(b)	Explain turbocharger with neat sketch.	**04**
	(c)	Explain heat balance in details.	**07**

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