Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– VI (New) EXAMINATION – WINTER 2019

Subject Code: 2161902 Date: 06/12/2019

Subject Name: Internal Combustion Engines

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.**

			MARKS
Q.1	**(a)**	Draw Port timing diagram of two stroke diesel engine.	**03**
	(b)	Explain effect of dissociation with suitable graphs.	**04**
	(c)	Define the following terms: (1) Bore (2) Stroke (3) Dead Centres (4) Clearance volume (5) Swept volume (6) Compression ratio (7) Piston speed.	**07**
Q.2	**(a)**	Explain bomb calorimeter with neat sketch.	**03**
	(b)	Compare Gasoline with CNG.	**04**
	(c)	Explain Solex Carburetor with neat sketch.	**07**
		OR	
	(c)	What are the requirements of ideal injection system for C.I. Engine?	**07**
Q.3	**(a)**	What are the functions of Ignition system?	**03**
	(b)	Compare battery ignition system with magneto ignition system.	**04**
	(c)	Explain High voltage capacitive discharge ignition system with neat sketch.	**07**
		OR	
Q.3	**(a)**	What are the objectives of supercharging?	**03**
	(b)	Explain the effects of supercharging.	**04**
	(c)	What is turbocharging? State the types of turbocharging and explain any one with neat sketch.	**07**
Q.4	**(a)**	What is ignition limit?	**03**
	(b)	Explain factors affecting on ignition lag in S. I. engine.	**04**
	(c)	Explain the stages of combustion of S.I. engine.	**07**
		OR	
Q.4	**(a)**	What is knocking?	**03**
	(b)	Explain factors affecting on delay period in C.I. engine.	**04**
	(c)	Explain the stages of combustion of C.I. engine.	**07**
Q.5	**(a)**	Compare wet and dry sump lubrication system	**03**
	(b)	Explain Exhaust Gas Circulation (EGR) with neat sketch.	**04**
	(c)	A one liter capacity, 4-stroke, 4 cylinder S.I. engine gives 30 % brake thermal efficiency and develops 40 kW indicated power at full load. The mechanical efficiency at half load is 35 % and compression ratio is 8. Assuming constant mechanical losses, Calculate. (1) Brake power and frictional power at full load (2) Mechanical efficiency at full load (3) Indicated thermal efficiency at full load (4) Clearance volume.	**07**
		OR	
Q.5	**(a)**	Explain Flame Ionization Detector with neat sketch.	**03**

(b) Explain forced circulation thermostat cooling system. **04**

(c) A 4 cylinder, 4 stroke petrol engine develops 21 kW. A Morse test was conducted at constant speed of 3000 rpm and B. P. is measured, when each cylinder was cut-off are 14.8, 14.5, 14.6 and 14.75 kW respectively. Find I.P. of the engine when all cylinders are developing power. Also find mechanical efficiency and brake mean effective pressure. Take bore = 7.5 cm and stroke = 9 cm. **07**

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