Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – III • EXAMINATION – WINTER • 2013

Subject code: 731101 Date: 26-11-2013

Subject Name: I.C.Engine modeling and simulation

Time: 10.30 am – 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.**

Q.1	**(a)**	Classify and Explain different types of diesel combustion system.	**07**
	(b)	Write a short note on computational modeling and simulation of I.C. Engine.	**07**
Q.2	**(a)**	Write a note on fuel-air cycle analysis for petrol engine considering gasoline as fuel.	**07**
	(b)	Explain combustion efficiency and inefficiency, considering IC engine as closed system.	**07**
		OR	
	(b)	Give a brief note on Droplet collision model and Droplet/Wall interaction model.	**07**
Q.3	**(a)**	Discuss diesel fuel spray structure with major parameter and neat sketch.	**07**
	(b)	Explain probability density function.	**07**
		OR	
Q.3	**(a)**	Generate zero dimensional, single zone models for progressive combustion with burning rate concept.	**07**
	(b)	State the procedure followed to generate simple model for engine process.	**07**
Q.4	**(a)**	Derive a spray combustion model for a low speed marine diesel engine.	**07**
	(b)	Derive phenomenological model of CI engine combustion.	**07**
		OR	
Q.4	**(a)**	Define and discuss spray equation model.	**07**
	(b)	Explain different impingement regimes and droplet transition condition with neat sketch.	**07**
Q.5	**(a)**	Derive wiebe heat release model.	**07**
	(b)	What is compression generated turbulence? Discuss its effect.	**07**
		OR	
Q.5	**(a)**	Define and classify turbulence modeling.	**07**
	(b)	Explain procedure for heat release analysis in DI compression ignition engine.	**07**

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