Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER III (OLD) – • EXAMINATION – SUMMER 2016

Subject Code: 731101 **Date:03/05/2016**

Subject Name: I. C. Engine modeling and simulation

Time:10:30 am to 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)**	What do you mean by simulation of internal combustion engine? Show step by Step approach for simulating Internal Combustion engine.	**07**
	(b)	For what purpose K-ε model method is used? Show its basic steps.	**07**
Q.2	**(a)**	What is the aim of engine modeling? State the procedure followed to generate Simple model for engine processes?	**07**
	(b)	Classify and Explain different types of diesel combustion system.	**07**
		OR	
	(b)	What is turbulence modeling? State its type.	**07**
Q.3	**(a)**	Explain fuel atomization and droplet evaporation modeling for phenomenological model.	**07**
	(b)	For thermodynamics model, explain wall heat transfer in Single –Zone cylinder model.	**07**
		OR	
Q.3	**(a)**	Classify the subdivision of zero dimension model of engine combustion modeling and state the assumption for typical two zone model.	**07**
	(b)	Explain combustion efficiency and inefficiency, considering IC engine as closed System.	**07**
Q.4	**(a)**	Discuss the boundary condition for spray modeling and combustion modeling in single cylinder engine.	**07**
	(b)	Explain wall impingement phenomenon and its effect.	**07**
		OR	
Q.4	**(a)**	Explain thin spray and thick spray modeling concept. In what situation, such modeling concepts apply?	**07**
	(b)	Explain drop drag and deformation of droplet.	**07**
Q.5	**(a)**	Explain diesel fuel spray structure with it's major parameter.	**07**
	(b)	Explore the procedure for heat release analysis in direct injection CI engine?	**07**
		OR	
Q.5	**(a)**	Define: 1) Premixed burning 2) Diffusive burning 3) Single-zone modeling	**07**
	(b)	Generate phenomenological model of CI engine combustion	**07**

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