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GUJARAT TECHNOLOGICAL UNIVERSITY ME – SEMESTER III (NEW) – EXAMINATION – WINTER-2016

Subject Code: 2732104 Date:25/10/2 Subject Name: Combustion Engineering Time:02:30 pm to 05:00 pm Tinstructions: 1. Attempt all questions. 2. Make suitable assumptions wherever necessary. 3. Figures to the right indicate full marks			5/10/2016 Marks: 70	
Q.1	(a)	Determine the stoichiometric equation for combustion of (a) Oxygen, (b) Air, (c)Excess fuel.	07	
	(b)	Explain the phenomenon of adiabatic flame temperature?	07	
Q.2	(a) (b)	Explain Global versus Elementary Reactions. Determine the chemical kinematic reaction for (a) H ₂ -O ₂ system (b) Carbon monoxide oxidation.	07 07	
	(b)	OR	07	
	(D)	Explain Uninfolecular reaction and Biomolecular reaction.	07	
Q.3	(a) (b)	What is Well Stirred flow reactor? Derive expression for it. Explain Momentum conservation in one dimensional form. OR	07 07	
Q.3	(a) (b)	What is plug flow reactor? Derive expression for it. Show that If of a cylindrical jet is an invariant. What is the physical meaning of I_f ?	07 07	
Q.4	(a)	Describe the droplet evaporation for diffusion flame. Also find out its governing and conservation equations.	07	
	(b)	Explain turbulent jet with its physical description and chemical reaction.	07	
Q.4	(a)	Explain the terms Quenching, Flammability and Ignition for laminar premixed flames	07	
	(b)	What is flame stabilization? Explain the stability of flame in premixed gas burner.	07	
Q.5	(a)	Define the turbulent flow. Determine the governing equations for axisymmetric turbulent flow.	07	
	(b)	Explain heterogeneous reactions.	07	
Q.5	(a)	OR Explain the modeling approach for premixed and partially premixed turbulent	07	
	(b)	Explain Wrinkled Laminar Flame regime.	07	

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