Seat No./Enrollment No.: _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BACHELOR OF ENGINEERING – SEMESTER 7 – EXAMINATION – SUMMER 2026

Subject Code: 2170501 **Date: 01/06/2026**

Subject Name: Chemical Reaction Engineering - II

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.**
4. **Simple and non-programmable scientific calculators are allowed.**

Q.1	**(a)**	List various contacting patterns in two-phase chemical reactions.	**03**
	(b)	Explain kinetic regime instantaneous reaction with respect to mass transfer.	**04**
	(c)	Explain C, E and F curves and relation between them.	**07**
Q.2	**(a)**	Define mean residence time.	**03**
	(b)	Explain variance and axial dispersion.	**04**
	(c)	Explain Langmuir–Hinshelwood–Hougen–Watson (LHHW) model for solid catalyzed gas phase reaction.	**07**
		OR	
	(c)	Explain pore diffusion resistance and surface kinetics for solid catalyzed reactions.	**07**
Q.3	**(a)**	Define Enhancement factor for fluid-fluid reactions.	**03**
	(b)	Explain kinetic steps involved in burning of coal as a heterogeneous reaction.	**04**
	(c)	Explain the Shrinking core model (SCM).	**07**
		OR	
Q.3	**(a)**	Define Hatta modulus.	**03**
	(b)	Explain overall rate expression for a linear heterogeneous chemical reaction.	**04**
	(c)	Explain spherical particle (unchanging size) Model when ash layer diffusion controls.	**07**
Q.4	**(a)**	Explain the significance of Hatta Modulus.	**03**
	(b)	Explain dispersion model.	**04**
	(c)	Explain physical properties of catalyst.	**07**
		OR	
Q.4	**(a)**	Explain the rate expression for infinitely slow reaction.	**03**
	(b)	Explain tank in series model.	**04**
	(c)	Explain classification of catalysts.	**07**
Q.5	**(a)**	Define catalyst and catalyst promotors.	**03**
	(b)	Explain any one method of preparation of catalysts.	**04**
	(c)	Explain Packed bed catalytic reactors.	**07**
		OR	

Q.5 **(a)** Define catalyst poisons and catalyst inhibitors. **03**

(b) Explain nature of catalytic reactions. **04**

(c) Explain fluidized bed reactors. **07**

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