

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE – SEMESTER V • EXAMINATION – WINTER - 2012****Subject code: 151301****Date: 11-01-2013****Subject Name: Elements of Chemical Engineering****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.

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|------------|--|-----------|
| <b>Q.1</b> | (a) Give the classification of types of reactions.                 | <b>07</b> |
|            | (b) Explain the various variables affecting the rate of reactions. | <b>07</b> |
| <b>Q.2</b> | (a) Differentiate between elementary and non elementary reactions. | <b>07</b> |
|            | (b) Discuss first order reaction with example.                     | <b>07</b> |
|            | <b>OR</b>  |           |
|            | (b) Make material balance of reactor.                              | <b>07</b> |
| <b>Q.3</b> | (a) Discuss the various types of reactors with example.            | <b>07</b> |
|            | (b) Explain second order reaction with example.                    | <b>07</b> |
|            | <b>OR</b>  |           |
| <b>Q.3</b> | (a) Differentiate between plug flow reactor and mix flow reactor.  | <b>07</b> |
|            | (b) How space time and space velocity used in reactor design?      | <b>07</b> |
| <b>Q.4</b> | (a) Make a material balance for batch reactor.                     | <b>07</b> |
|            | (b) Discuss temperature dependency and Arrhenius Law.              | <b>07</b> |
|            | <b>OR</b>  |           |
| <b>Q.4</b> | (a) Discuss experimental method of RTD.                            | <b>07</b> |
| <b>Q.4</b> | (b) Make a material balance for mix flow reactor.                  | <b>07</b> |
| <b>Q.5</b> | (a) Write a short not on Fluidized bed reactor.                    | <b>07</b> |
|            | (b) Discuss single and multiple reactions in detail.               | <b>07</b> |
|            | <b>OR</b>  |           |
| <b>Q.5</b> | (a) Write a short not on Fixed-bed reactor.                        | <b>07</b> |
|            | (b) How to calculate activation energy? Explain in brief.          | <b>07</b> |

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