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Roll No

CM-7002-CBGS

B.E. VII Semester

Examination, June 2020

Choice Based Grading System (CBGS)

Chemical Reaction Engineering-II

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.

ii) All questions carry equal marks.

iii) Attempt all part of question.

1. a) What do you understand from catalysis? What are different types of catalysis?
b) Discuss different properties of catalyst.
c) Define adsorption. Derive an expression for Langmuir adsorption isotherm.

2. a) How porosity of catalyst affect the performance of catalyst?
b) What do you understand by yield and selectivity?
c) Discuss internal mass transfer limitations in catalytic reaction (Heterogeneous). Derive an expression for effectiveness factor.

3. a) Discuss fixed bed catalytic reactor. What are the design parameters of fixed bed reactor?
b) Write down the differences between trickle bed and slurry bed reactor.
c) Derive an expression for rate equation for slurry reactor and design equation for slurry reactor.

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4.
 - a) What are the series of resistances encountered in gas-solid reaction?
 - b) What are the different models used to understand non-catalytic fluid-solid reaction? Explain them.
 - c) Describe the Shrinking core model with gas film controlled diffusion.

5.
 - a) What are the difference between aerobic fermentation and anaerobic fermentation?
 - b) Discuss in brief about two film theory.
 - c) Derive Michaelis-Menten kinetics for first order reaction.

6.
 - a) Write down various steps in valve in catalytic heterogeneous reaction.
 - b) Define catalyst poisoning. What are different mechanism of catalyst poisoning.
 - c) Describe the Shrinking core model with Ash layer controlled diffusion.

7. Derive rate equation for solid catalyzed reaction $A \rightleftharpoons R$.

8.
 - a) What are the various ways of running Gas-liquid reaction catalyzed by solids?
 - b) Discuss dual site mechanism.
 - c) Derive a performance equation for plug flow reactor containing porous catalyst particles.

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