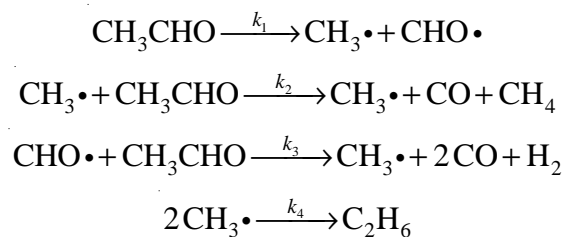


CM-704 (GS)
B.E. VII Semester Examination, June 2020
Grading System (GS)
Chemical Reaction Engineering - II
Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.
 ii) All questions carry equal marks.

1. Define and characterize the major types of catalyst deactivation: solid-state transformations, poisoning, and coking.
2. The elementary irreversible organic liquid phase reaction $A + B \rightarrow C$ is carried out adiabatically in a flow reactor an equal molar feed in A and B enters at 27°C and the volumetric flow rate is 2 dm³/s.
 - a) Calculate the PFR and CSTR volumes necessary to achieve 85% conversion.
 - b) Calculate the conversion that can be achieved in one 500 dm³ CSTR and in two 250 dm³ CSTR in series.
3. Explain Shrinking core model.
4. Explain the rate equation based on film theory for instantaneous reaction with low C_B. The reaction is
 $A(g) + B(liq) \rightarrow R(S, \text{liquid or } g)$.
5. Define the following term:
 - i) Slurry reactor
 - ii) Trickle bed reactor
6. Describe general mechanism of catalytic reactions in seven steps.
 The pyrolysis of acetaldehyde is believed to take place according to the following sequence:



Derive the rate expression for the rate of disappearance of acetaldehyd $-r_{Ac}$.

7. a) What is Michaelis-Menten equation?
 b) What is Lewis Whitman two-film model?
8. a) Explain adsorption and its types.
 b) Explain binary diffusion.
 c) Explain heterogeneous reaction and global reaction rate.
