



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2021

Course: Catalysis & Catalytic Design

Program: B.Tech (CE+RP)

Course Code: CHCE4014P

Semester : VII

Duration : 03 hrs.

Max. Marks: 100

Instructions: (i) This question paper has three sections- A, B and C. All questions of each section are compulsory.

(iii) Attempt all the sub-parts of a question together.

SECTION A			
(5Qx 4M = 20 Marks)			
		Marks	COs
Q 1	Differentiate between physical and chemical adsorption.	4	CO2
Q 2	What are the characteristics of a good catalyst?	4	CO1
Q 3	Discuss the shape selective catalysis using zeolites with suitable examples.	4	CO5
Q 4	Explain (i) Poisoning of Catalysts (ii) sintering of catalysts.	4	CO3
Q 5	Describe any two methods used for regeneration of a catalyst in brief.	4	CO4
SECTION B			
(4Qx10M = 40 Marks)			
Q 1	List out the different compounds used as industrial catalysts and steps involved in manufacturing of these catalysts.	10	CO4
Q 2	Explain with diagram mechanism of heterogeneous catalytic reactions.	10	CO1
Q 3	Give an account of the surface characterization methods for supported metal catalysts.	10	CO3
Q 4	With the help of flow diagram explain any two conventional technique of catalyst preparation.	10	CO4
SECTION-C			
(2Qx 20M= 40 Marks)			
Q 1	Define: Active Site, Functionality, Turnover Frequency. In BET surface area technique what are the different parameters calculated and how they affect the activity and stability of catalyst.	20	CO5
Q 2	“Catalysis is the backbone of industrial processes” give justification. Discuss different catalytic processes involved in petroleum refineries in detail.	20	CO2