

B.E. CHEMICAL ENGINEERING THIRD YEAR SECOND SEMESTER SUPPLEMENTARY EXAM 2023

CHEMICAL TECHNOLOGY-II

Time: Three Hours

Full Marks: 100

Answer any FIVE questions

Question No	CO No.	Question	Marks
1.	CO1	(i) Briefly discuss the influence of salient operating parameters on the performance of 'Crude Oil Electric Desalting Unit'.	10
		(ii) Briefly Explain different types of reflux arrangement as used for petroleum fractionating column and comment on their relative merits and demerits.	10
2.	CO2	(i) What are the objectives of hydrotreatment of petrochemical feedstocks bearing sulfur, nitrogen and oxygen impurities? Describe a typical hydrotreatment process using a simplified process flow diagram mentioning the pertinent major reactions and operating conditions employed.	2+8
		(ii) Discuss the operation of the reactor and regenerator sections of FCC unit of a petroleum refinery (flowsheet not required).	10
3.	CO3	(i) Briefly describe the production of ethanol through catalytic hydration of ethylene mentioning process parameters using a simple process flow diagram. Why is it desirable to use a water/ethylene mole ratio < 1.0?	8+2
		(ii) what is oxo-synthesis? Describe the production of propionaldehyde from synthesis gas and ethylene through oxo-synthesis using a process flow diagram.	4+6
4.	CO3	(i) Mention the reactions, catalysts used, operating conditions maintained and byproducts formed in the production of acrylonitrile by ammoxidation of propylene (use flow diagram).	10
		(ii) Briefly describe the alkylation of benzene with ethylene for production of ethyl benzene mentioning the reactions involved, operating conditions maintained employing H-ZSM catalyst (use flow diagram).	10
5.	CO4	(i) Briefly describe the production of polyester fiber using terephthalic acid as the feedstock mentioning the reactions involved, operating conditions (use flow diagram).	10
		(ii) Briefly discuss the production of acrylonitrile-butadiene-styrene plastic (use flow diagram).	10
6.	CO5	(i) Using a process diagram, discuss the production of benzene alkylate through chlorination using paraffinic feedstock.	10
		(ii) Using a process diagram, discuss the production of detergent (linear alkylbenzene sulfonate) using Kerosene range paraffin as a feedstock.	10
7.	CO6	Describe the production of rectified spirit (95.5% ethanol) by industrial fermentation of molasses (use flow diagram).	20