BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: BTECH **SEMESTER: V/ADD**
BRANCH: CHEMICAL **SESSION: MO/2025**

SUBJECT: CL337 CHEMICAL PROCESS TECHNOLOGY

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	Briefly illustrate, with a neat diagram, the manufacturing process of sodium hydroxide (NaOH) using a diaphragm cell. Also, explain why the mercury cell process is considered more advantageous than other methods.	[5]	1	2
Q.1(b)	Briefly explain the synthesis of soda ash by the LeBlanc process, including the key reactions involved. Also, discuss the disadvantages of this process compared to the Solvay process.	[5]	1	2
Q.2(a)	Illustrate a neat process flow diagram for lime manufacturing.	[5]	1	2
Q.2(b)	Summarize the properties of any TWO types of cement and outline the schematic figure of repulping wet process for H_3PO_4 production & name the scrubbing liquors used in MAP/DAP production	[5]	2	2
Q.3(a)	Outline an integrated flowsheet depicting the combined production of SSP & TSP	[5]	2	2
Q.3(b)	Compare three different pressures used in nitric acid production process & list major engineering problems countered in NH_4NO_3 production and draw a block diagram flowsheet of a total recycle CO_2 stripping Urea process.	[5]	3,4	4
Q.4(a)	Explain the continuous saponification process used in soap manufacturing, with special emphasis on the recovery and purification of glycerin.	[5]	2	2
Q.4(b)	Why is double carbonation with CO_2 and double sulphitation with SO_2 required during the process of sugar manufacturing?	[5]	2	4
Q.5(a)	Describe in detail the production process of styrene with the help of a flow sheet. Also, explain why an inhibitor is required during the storage and transportation of styrene.	[5]	2	2
Q.5(b)	Analyze the role of hydrogenation in terephthalic acid production process and discuss the use of hot water in the step along with catalyst used & illustrate a neat flowsheet for combined production of phthalic anhydride and maleic anhydride and discuss the role of three switch condensers used in it.	[5]	3	4

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