

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

CLASS: BTECH
BRANCH: CHEMICAL

SEMESTER : V/ADD
SESSION : MO/2025

SUBJECT: CL337 CHEMICAL PROCESS TECHNOLOGY

TIME: 02 Hours

FULL MARKS: 25

INSTRUCTIONS:

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates
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		CO	BL
Q.1(a)	Highlighting the major aspects of the contact process of sulfuric acid manufacturing. What is the role of the heat exchanger in this process?	[2] 1	2
Q.1(b)	Briefly explain with a diagram the caustic soda preparation through the mercury cell process. Why is this process advantageous over others?	[3] 1	3
Q.2(a)	How do you purify a brine solution before electrolysis during caustic soda synthesis?	[2] 2	2
Q.2(b)	Briefly outline the Solvay process of soda ash synthesis with process flow diagram. Write the chemical reaction occurs in Solvay tower.	[3] 2	3
Q.3(a)	What is the rate determining step in contact process of sulfuric acid preparation? How do you control rate with respect to pressure and temperature?	[2] 2	2
Q.3(b)	Illustrate thermal process H_3PO_4 production with a neat flow sheet	[3] 1	1
Q.4(a)	Describe the following: (i) unique applications of MAP (ii) chemical structure of tetrasodium pyrophosphate (iii) Colloidal Calcium Phosphate	[2] 1	1
Q.4(b)	Differentiate HDH and DH/HH wet process H_3PO_4 production through flow sheets and explain how recrystallisation process raises overall efficiency	[3] 2	4
Q.5(a)	Outline the reactions and temperatures in calcining zone and sintering zone of a kiln in cement production process and also describe 'low heat cement'	[2] 2	2
Q.5(b)	Distinguish 'step 3' of dry process and wet process of cement manufacturing with schematic figures and mention names of compounds present in cement along with molecular and abbreviated formulae	[3] 2	4

:::::22/09/2025 :::::M