

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

CLASS: BTECH
BRANCH: CHEMICAL / P&P

SEMESTER : VI
SESSION : SP/2023

SUBJECT: CL317 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.
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Q.1(a)	Specify the source processes with their chemical reactions for elemental sulfur production in India.	[2] 1	1,2
Q.1(b)	Draw the flowsheet of the Solvay process for soda ash production with the operating conditions and chemical reactions.	[5] 1,2	2
Q.1(c)	Depict the major engineering problems of the contact process for H ₂ SO ₄ production.	[3] 3,4	2
Q.2(a)	Explain the Portland cement production process with a flow sheet.	[5] 1,2	2
Q.2(b)	Depict the grading for a phosphate rock. Why is the grading an important?	[2] 1	2
Q.2(c)	Mention different unit operations and unit processes with the chemical reactions to produce phosphoric by an electric furnace method.	[3] 1,2	2
Q.3(a)	Demonstrate the use of nitric acid.	[1] 1	1
Q.3(b)	Explain the ammonia manufacturing process with a flow sheet.	[5] 1,2	2
Q.3(c)	Outline the modifications of methods which prevent and limit the formation of the biuret in a urea plant.	[4] 3,5	4
Q.4(a)	Briefly explain any one of the followings: i) hydrogenation of vegetable oil and ii) production of detergent from coconut oil.	[3] 1	2
Q.4(b)	Draw the flowsheet of the sulfate (kraft) pulp process for paper production with the operating conditions.	[4] 1,2	2
Q.4(c)	Outline the steps to make the bioethanol production process the economic and environmentally sustainable.	[3] 5	4
Q.5(a)	Demonstrate the source processes and uses of benzene, toluene, and xylene.	[4] 1	1
Q.5(b)	Explain the production process of phthalic anhydride with a flow sheet.	[6] 2	2

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