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Roll no. .....

National Institute of Technology, Hamirpur

B. Tech. (Chemical Engineering) - 4th Semester

End Term Exam (May, 2023)

CH-224: Chemical Technology

Duration: 3 hrs **Max. Marks: 50**

Note: *This question paper consists of five questions and one page.*

- *Attempt all questions.*
- *Assume appropriate data wherever necessary*

Attempt the following;

Q. No.	Questions	Marks
Q1.	**(a)** Explain the manufacturing of ethanol from molasses with complete set of chemical reactions and process diagram.	1+2+3=6
	(b) List the different types of extenders, solvents and diluents used in paint manufacturing? Draw the manufacturing process block diagram of paint.	2+2=4
Q2.	**(a)** Write down the complete set of chemical reaction involved in the manufacturing of soap and detergent.	1.5+1.5=3
	(b) How is turpentine recovered in the pulp manufacturing process? Write down the complete set of chemical reactions involved in the sulfate pulping process.	1+2=3
	(c) Draw the block diagram of edible oil manufacturing process. Write down the complete set of chemical reaction involved in hydrogenation of oil.	2+2=4
Q3.	Give two examples of alkylation along with involved chemical reaction. Describe the manufacturing process of caustic soda by diaphragm cell process along with involved chemical reactions and neat process flow diagram.	2+2+1+3 = 8
Q4.	Write down any five pertinent properties of ammonium chloride. Describe its manufacturing by dual salt process along with chemical reactions involved and neat sketch of process flow diagram. What are the by-products generated?	2+2+1+4 +1=10
Q5.	**(a)** Write down the amount of all the required raw materials to manufacture 1000 kg of nitric acid by ammonia oxidation process and draw the neat sketch of its process flow diagram.	2+3=5
	(b) Differentiate the wet process and dry process of cement manufacturing with 6-6 technical aspects of each. Write down the complete set of chemical reaction involved in manufacturing of Portland cement.	3+2=5
	(c) Explain the GOB formation in glass manufacturing with neat sketch.	1+1=2

----------All the Best----------