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GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Fifth Semester – Regular) Examinations, December – 2022

BPCCH5010 – CHEMICAL PROCESS TECHNOLOGY

(Chemical Engineering)

Time: 3 hrs

Maximum: 70 Marks

Answer ALL Questions

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions)

(1 x 10 = 10 Marks)

Q.1. Answer ALL questions

- | | CO# | PO # |
|-------------------------------------------------------------------------------------------|-----|------|
| a. Contact process of sulphuric acid manufacture | CO1 | PO1 |
| i. yields acid of higher concentration than chamber process. | | |
| ii. yields acids of lower concentration than chamber process | | |
| iii. is obsolete. | | |
| iv. eliminates absorber | | |
| b. Raw materials for 'Solvay Process' for manufacture of the soda ash are | CO1 | PO2 |
| i. salt, limestone and coke or gas. | | |
| ii. ammonia, salt and limestone. | | |
| iii. ammonia limestone and coke. | | |
| iv. none of these | | |
| c. Oil is a/an | CO1 | PO1 |
| i. mixture of glycerides. | | |
| ii. mixture of glycerides of fatty acids. | | |
| iii. solid at normal temperature | | |
| iv. ester of alcohols other than glycerine. | | |
| d. Unsaturated oils compared to saturated oils have | CO1 | PO2 |
| i. lower melting point & higher reactivity to oxygen. | | |
| ii. higher melting point & higher reactivity to oxygen. | | |
| iii. higher melting point & lower reactivity to oxygen. | | |
| iv. higher melting point & lower reactivity to oxygen. | | |
| e. Rancidity of the fatty oil can be reduced by its | CO2 | PO1 |
| i. decoloration | | |
| ii. hydrogenation | | |
| iii. oxidation | | |
| iv. purification | | |
| f. Soaps remove dirt by | CO2 | PO1 |
| i. increasing the surface tension. | | |
| ii. decreasing wettability. | | |
| iii. supplying hydrophylic group. | | |
| iv. none of these | | |
| g. Laboratory glass wares which reacts with hydrofluoric acid, are made of the -----glass | CO3 | PO2 |
| i. Lead | | |
| ii. Borosilicate | | |
| iii. Soda lime | | |
| iv. Alkali silicate | | |
| h. The ideal pulp for the manufacture of paper should have high content. | CO4 | PO1 |
| i. Cellulose | | |
| ii. lignin | | |
| iii. both (i) & (ii) | | |
| iv. none of these | | |
| i. Molasses is the starting material for the production of | CO4 | PO2 |
| i. alcohol | | |
| ii. essential oil | | |
| iii. fatty acids | | |
| iv. massecuite | | |
| j. Soap cannot be used with hard water, because | CO4 | PO1 |
| i. hard water contains sulphate. | | |
| ii. they form insoluble calcium soaps which precipitate. | | |
| iii. they attract back the removed dirt. | | |
| iv. none of these. | | |

PART – B: (Short Answer Questions)

(2 x 10 = 20 Marks)

Q2. Answer ALL questions

CO # PO #

- a. Enumerate the three major industrial chemicals which comes under Chlor-Alkali Industry. CO1 PO1

b. Mention the chemical formula of washing soda.	CO1	PO2
c. Mention the properties and uses of chlorine.	CO2	PO2
d. Name the catalyst used for DCDA process for sulphuric acid manufacture and mention its characteristics?	CO1	PO3
e. Write down the reactions occurred at cathode and anode for a mercury cell used for the production of NaOH.	CO3	PO2
f. Identify the different sources of raw material that can be used in Paper Industry.	CO2	PO1
g. What is the role of Antioxidant in the Oil industry?	CO3	PO1
h. Write the chemical formula of ABS? What is its application?	CO3	PO2
i. Mention some of the principal compounds which are used in white Pigment.	CO4	PO1
j. What are the by-products of sugar industry and its uses?	CO4	PO3

PART – C: (Long Answer Questions)

(10 x 4 = 40 Marks)

<u>Answer ALL questions</u>	Marks	CO #	PO #
3.a. Discuss in detail, the manufacture of soda ash by Solvay process giving emphasis on chemical reactions?	8	CO1	PO1
b. Analyze some of the Process Equipment Symbols which are used for Evaporation, Fluid-solid Contacting.	2	CO1	PO2
(OR)			
c. Illustrate the synthetic Hydrochloric acid production with a neat flow sheet?	8	CO1	PO3
d. Analyze some of the Process Equipment Symbols which are used for Extraction and Fluid Handling.	2	CO1	PO2
4.a. Explain in details about continuous process for fatty acids, soaps and glycerine with a neat flow chart?	8	CO2	PO1
b. Analyse about Fat Splitting and Saponification by mentioning the chemical reaction.	2	CO2	PO1
(OR)			
c. With the help of neat flow sheet describe the sulphate process for the preparation of wood pulp	8	CO2	PO1
d. How and which chemical is used for Bleaching of Pulp.	2	CO2	PO2
5.a. Describe about Indian Sugar Industry mentioning about Extraction of Sugar from sugar cane with neat flow sheet	8	CO3	PO2
b. How massecuite is converted to blackstrap molasses?	2	CO3	PO3
(OR)			
c. What are the raw materials for preparation of glass?	2	CO3	PO1
d. What are the manufacturing steps involved in preparation of glass?	8	CO3	PO2
6.a. Discuss in details with a neat flow sheet the production of polyethylene by low pressure Ziegler's process. Mention its properties and uses.	6	CO4	PO1
b. Explain about the chemistry of Polycondensation Process.	4	CO4	PO3
(OR)			
c. Examine the chemistry, production and uses of cellulose. Mention the production process of 6,6-nylon	6	CO4	PO1
d. Classify the Polymer On the basis of physical structure	4	CO4	PO2

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