Q. Code: 324183

Reg. No. | | | | | | | | | | | | | |

B.E / B.TECH. DEGREE EXAMINATIONS, MAY 2023

Third Semester

CH18304 – CHEMICAL PROCESS INDUSTRIES I

(Chemical Engineering)

(Regulation 2018A)

TIME: 3 HOURS **MAX. MARKS: 100**

CO 1 Build a basic knowledge of the process carried out in chemical industry and review its practical importance.

CO 2 Understand the role of chemical engineers in process industries, Process Plant Safety and environment.

CO 3 Utilize the technological methods in problem solving in process plant.

CO 4 Study about the salient features of the process.

CO 5 Build a bridge between theoretical and practical concept used in industry.

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	Identify the various equipment used for handling of solids in industry.	**1**	**1**
2.	State the advantages of the mercury cell over the diaphragm cell employed in chlorine-caustic soda production.	**1**	**1**
3.	Indicate any three Smelter gas based industries in India.	**2**	**2**
4.	Write about the catalyst used in contact Process.	**2**	**2**
5.	Highlight the importance of glass ceramics and how are they formed.	**3**	**2**
6.	Distinguish between the chemical compositions of any four different types of glass.	**3**	**2**
7.	List out the different methods of production of Phosphorous.	**4**	**2**
8.	Write the kinetics of ammonia production.	**4**	**2**
9.	Distinguish three major components of fertilizer which are necessary for plant growth.	**5**	**2**
10.	List the different types of herbicides? Classify them based on the method of application.	**5**	**2**

PART- B (5 x 14 = 70 Marks)

		Marks	CO	RBT LEVEL
11. (a)	Analyze the various possible mechanisms that can be implemented to produce caustic soda with a neat flow diagram.	**(14)**	**1**	**3**

(OR)

(b)	Explain any four unit operations with their schematic representations and four unit processes used in chemical process industries and briefly review its importance and usages.	**(14)**	**1**	**3**
12. (a)	Identify the reactions and energy requirements for the production of hydrochloric acid with neat flow diagram.	**(14)**	**2**	**3**
	(OR)			
(b)	Analyze chemical reactions, quantitative requirements, plant capacities and major engineering problems in the Finnish process and explain the production of elemental sulphur from pyrites by Finnish process with a neat flow diagram.	**(14)**	**2**	**3**
13. (a)	Explain physical and chemical changes during thermal treatment of ceramic products and distinguish between the varieties of ceramics.	**(14)**	**3**	**3**
	(OR)			
(b)	Explain the physical operations and chemical conversions used in the manufacture of refractories with a neat flow diagram.	**(14)**	**3**	**3**
14. (a)	Explain major engineering problems in the process of urea production and explain the urea production from ammonium carbonate with a neat flow diagram.	**(14)**	**4**	**3**
	(OR)			
(b)	Explain the role of chemical reactions, reaction equilibrium and catalyst in ammonia synthesis with a neat flow diagram.	**(14)**	**4**	**3**
15. (a)	Explain the various mechanical operations and their role in the manufacture of superphosphates with a neat flow diagram.	**(14)**	**5**	**3**
	(OR)			
(b)	Analyze the unit operations and chemical reactions involved in the manufacture of ammonium phosphate with a neat flow diagram.	**(14)**	**5**	**3**

PART- C (1 x 10 = 10 Marks)

(Q.No.16 is compulsory)

		Marks	CO	RBT LEVEL
16.	Explain briefly about the production of phosphoric acid from phosphate rock by a strong acid process using a neat flow diagram and indicate the major engineering problems encountered during the process.	**(10)**	**5**	**3**

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