Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III(New) • EXAMINATION – WINTER 2016

Subject Code:2130505 **Date:02/01/2017**

Subject Name:Chemical Process Industries-1

Time:10:30 AM to 01:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1		**Short Questions**	**14**
	1	What do you understand by hardness of water?	
	2	Differentiate between batch process and continuous process.	
	3	What do you understand by desalination of brackish water?	
	4	Define disinfection.	
	5	State two uses of sulfuric acid.	
	6	Define electro-dialysis process.	
	7	State the uses of carbon black.	
	8	What is pulp?	
	9	State two uses of carbon monoxide.	
	10	Write two compounds of calcium and their uses.	
	11	What do you understand by 5–10–5 fertilizer?	
	12	Differentiate between explosive and propellant.	
	13	Write any two types of papers and their uses.	
	14	What are main products of chlor–alkali industries?	
Q.2	**(a)**	Explain the principle of reverse osmosis.	**03**
	(b)	With a neat sketch, explain elemental sulfur mining by Frasch Process.	**04**
	(c)	Describe any one industrial process used for softening of water with a neat schematic diagram.	**07**
		OR	
	(c)	With a process flow diagram, describe the manufacture of sulfuric acid by DCDA process.	**07**
Q.3	**(a)**	State the uses and applications of phosphoric acid.	**03**
	(b)	Discuss the catalyst development and process design modifications in the manufacture of ammonia.	**04**
	(c)	With a process flow diagram, discuss the manufacture of urea by ammonium carbamate decomposition.	**07**
		OR	
Q.3	**(a)**	Discuss the advantages and disadvantages of mercury cell process used for the production of caustic soda.	**03**
	(b)	Discuss the major engineering problems in the manufacture of urea.	**04**
	(c)	Describe modified Solvay process (dual process) for the manufacture of soda ash and also discuss the major engineering problems.	**07**
Q.4	**(a)**	Discuss the types of portland cements.	**03**
	(b)	Briefly describe the manufacturing of graphite.	**04**
	(c)	With a schematic diagram of diaphragm cell, describe the electrolysis of aqueous salt solutions with cell reactions. State its advantages.	**07**
		OR	
Q.4	**(a)**	State the sources and uses of carbon dioxide.	**03**
	(b)	Write a short note as industrial diamonds.	**04**
	(c)	With a schematic diagram of double-column rectifier, describe the separation of oxygen and nitrogen from cleaned air by Linde process.	**07**
Q.5	**(a)**	State the uses and applications of activated carbon.	**03**

	(b)	What are the different types of glasses and their uses?	**04**
	(c)	Write a short note on explosives and propellants.	**07**
		OR	
Q.5	**(a)**	State the uses and applications of helium and acetylene.	**03**
	(b)	Describe sulfate (Kraft) pulp process used for the production of cellulose fibres.	**04**
	(c)	With a neat schematic diagram, describe the paper making process.	**07**

****