

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE- SEMESTER-III (NEW) EXAMINATION – WINTER 2020****Subject Code:2130505****Date:10/03/2021****Subject Name:Chemical Process Industries-1****Time:10:30 AM TO 12:30 PM****Total Marks:56****Instructions:**

1. Attempt any **FOUR** questions out of **EIGHT** questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Differentiate between batch and continuous processing with a suitable example. **03**  
(b) With a neat diagram explain the principle of reverse osmosis. **04**  
(c) Explain the manufacture of sulfuric acid by DCDA process with a neat process flow diagram. **07**
- Q.2** (a) Mention the properties and uses of nitric acid **03**  
(b) What are the requirements of drinking water? **04**  
(c) Describe ion exchange process of deionization of raw water with a neat process flow diagram **07**
- Q.3** (a) State the uses and applications of phosphoric acid. **03**  
(b) Discuss about the major engineering problems associated with the manufacture of nitric acid. **04**  
(c) Explain the manufacture of caustic soda and chlorine by membrane cell process. Also state the advantages of using membrane cell. **07**
- Q.4** (a) State the types of glasses and their uses. **03**  
(b) Discuss about the basic raw materials used in ceramic industries. **04**  
(c) Stating the types of Portland cement, explain the production of cement by wet process. **07**
- Q.5** (a) Mention two rare gases of atmosphere and give one use of each. **03**  
(b) Discuss about the equilibrium-temperature relation for the conversion of  $\text{SO}_2$  to  $\text{SO}_3$ . **04**  
(c) State the uses of sodium bicarbonate. Describe the manufacturing of sodium bicarbonate by Solvay process. **07**
- Q.6** (a) State the properties and uses of hydrogen. **03**  
(b) What is activated carbon? State its applications. **04**  
(c) With a neat diagram describe the production of graphite. **07**
- Q.7** (a) State the raw materials used in paper industries. **03**  
(b) Briefly explain Kraft process of making pulp. **04**  
(c) Stating the types of paper and their uses, explain the paper making process with a schematic diagram. **07**
- Q.8** (a) What are the requirements of a good propellant? **03**  
(b) What is explosive? Discuss about its types with examples. **04**  
(c) With a neat sketch, explain the separation of nitrogen and oxygen by Linde process. **07**

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