

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER– III (NEW) EXAMINATION – SUMMER 2022****Subject Code:2130505****Date:13-07-2022****Subject Name:Chemical Process Industries-I****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) What do you understand by NPK fertilizer? Explain. **03**  
(b) Mention the important characteristics of safe drinking water. **04**  
(c) With a neat flow diagram, describe the deionization of raw water by ion exchange process. **07**

- Q.2** (a) Explain the principle of reverse osmosis. **03**  
(b) State the major engineering problems in the manufacture of urea. **04**  
(c) Explain the production of caustic soda and chlorine by membrane cell process. Also mention the advantages of membrane cell. **07**

**OR**

- (c) Describe the manufacturing of sodium bicarbonate by Solvay process. Also, state the uses of sodium bicarbonate. **07**

- Q.3** (a) Mention the types of paper and their uses. **03**  
(b) Briefly explain Kraft process of making pulp. **04**  
(c) Describe the paper making process with a neat schematic diagram. **07**

**OR**

- Q.3** (a) State the types of glasses and their uses. **03**  
(b) Discuss about the basic raw materials used in ceramic industries. **04**  
(c) With a neat diagram, explain the production of cement by wet process. **07**

- Q.4** (a) State the uses and applications of ammonia. **03**  
(b) Discuss about the major engineering problems associated with the manufacture of nitric acid. **04**  
(c) With a process flow diagram describe the manufacture of sulfuric acid by DCDA process. **07**

**OR**

- Q.4** (a) State the properties and uses of hydrogen. **03**  
(b) What is activated carbon? State its applications. **04**  
(c) With a neat schematic diagram describe the manufacture of graphite. **07**

- Q.5** (a) With examples explain toxic chemical agents. **03**  
(b) What do you understand by carbon black? State its uses. **04**  
(c) Describe the separation of nitrogen and oxygen from purified air by Linde process. **07**

**OR**

- Q.5** (a) What are the characteristics of a good propellant? **03**  
(b) What is explosive? State its types with an example for each. **04**  
(c) What is desalination? Describe any one desalination process with a neat diagram. **07**

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