

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III (NEW) - EXAMINATION – SUMMER 2017****Subject Code: 2130505****Date: 31/05/2017****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.

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| Q.1 | Short Questions | 14 |
| | 1 What do you understand by batch process? | |
| | 2 State two drawbacks of using hard water. | |
| | 3 What is brackish water? | |
| | 4 State two uses of phosphoric acid. | |
| | 5 State the main products of chlor – alkali industries. | |
| | 6 Mention two uses of carbon dioxide. | |
| | 7 Mention the major products of ceramic industries. | |
| | 8 State two uses of hydrogen. | |
| | 9 Give two industrial uses of carbon monoxide. | |
| | 10 Differentiate between fire and explosion. | |
| | 11 State two applications of acetylene. | |
| | 12 What is pulp? | |
| | 13 What do you understand by desalination? | |
| | 14 State two uses of sodium bicarbonate. | |
| Q.2 | (a) What do you understand by NPK fertilizer? Explain. | 03 |
| | (b) With a neat diagram, explain the principle of reverse osmosis. | 04 |
| | (c) With a neat process flow diagram, describe the manufacture of sulfuric acid by DCDA process. | 07 |
| | OR | |
| | (c) With a schematic diagram, explain the production of caustic soda using electrolysis of aqueous salt solutions by membrane process. State advantages and disadvantages of membrane process. | 07 |
| Q.3 | (a) What are the requirements of drinking water? | 03 |
| | (b) Briefly describe the mining of sulfur by Frasch process. | 04 |
| | (c) Describe ion exchange process of deionization of water with a neat process diagram | 07 |
| | OR | |
| Q.3 | (a) Discuss the major engineering problems in the manufacture of ammonia. | 03 |
| | (b) Briefly describe the production of sodium bicarbonate by Solvay process, with reactions. | 04 |
| | (c) With a neat process flow diagram, describe the production of urea by ammonium carbamate decomposition. | 07 |
| Q.4 | (a) State two rare gases of atmosphere and discuss about their sources and uses. | 03 |
| | (b) Briefly discuss the equilibrium - temperature relation for the conversion of SO ₂ to SO ₃ . | 04 |
| | (c) With a neat flow chart, discuss the production of carbon black. | 07 |

OR

- Q.4** (a) Write a short note on industrial diamonds. **03**
(b) Briefly discuss the production of oxygen and nitrogen by Linde process. **04**
(c) What do you understand by activated carbon? Briefly describe the production and uses of activated carbon. **07**
- Q.5** (a) State the types of glasses and their uses. **03**
(b) State four industrial chemical compounds of calcium and magnesium each and their uses. **04**
(c) Stating the types of Portland cement, describe the production of Portland cement. **07**

OR

- Q.5** (a) Discuss the requirements of a good propellant. **03**
(b) Compare Sulfate (Kraft) process with sulfite process used for the production of pulp. **04**
(c) Stating the raw materials used for paper products, describe the paper making process with a schematic diagram. **07**
