

17314

13141

3 Hours / 100 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
(2) Answer each next main Question on a new page.
(3) Illustrate your answers with neat sketches wherever necessary.
(4) Figures to the right indicate full marks.
(5) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. a) Attempt any SIX of the following: 12
- i) Name the four factors which affect the reaction rates.
 - ii) Define chemical equilibrium by giving any one type of reaction.
 - iii) Solve law of mass action.
 - iv) Define spontaneous process with one chemical reaction.
 - v) State 1st law of thermodynamics.
 - vi) Write any two uses of ammonia.
 - vii) Write the use of CO₂ in carbonating tower for manufacturing of soda ash.
 - viii) Define hardening and setting of cement.

P.T.O.

b) **Attempt any TWO of the following:** **8**

- i) Write the names of raw material required to manufacture HCl by Synthesis process and give its manufacturing flow diagram.
- ii) Discuss in brief uses of nitrogen and oxygen gases.
- iii) Describe manufacturing of portland cement by wet process with a neat process flow diagram.

2. **Attempt any TWO of the following:** **16**

- a) Describe manufacturing of ammonia with flow diagram.
- b) Draw and describe manufacturing process of red phosphorus.
- c) Draw and describe manufacturing process of chlorine and caustic soda by electrolytic process.

3. **Attempt any FOUR of the following:** **16**

- a) Draw and describe manufacturing process for single super phosphate.
- b) Compare phosphorus tri and penta chloride w.r.t. to raw material, uses and reaction.
- c) How phosphoric acid is manfu. by wet process. Draw diagram with description.
- d) Write in details mercury cell and diaphragm cells in case of chlorine manufacture.
- e) Write the chemical reaction involved in Solvay process.
- f) Draw and describe manf. of hydrochloric acid from salt and sulphuric acid.

4. Attempt any FOUR of the following:**16**

- a) Write two properties and two uses each of caustic soda and chlorine.
- b) What different grades of phosphorous are available for commercial use ?
- c) Distinguish between red and yellow phosphorous (any four points). State two industrial uses of both.
- d) Write any four uses of soda ash.
- e) Draw and describe a neat flow diagram for the manufacturing of producer gas. State the uses of the same.
- f) Describe manufacturing process for acetylene from calcium carbide. Draw the flow diagram for the process.

5. Attempt any TWO of the following:**16**

- a) Draw and describe ammonium carbonate method with reaction and flow diagram for urea.
- b) Describe manufacturing O_2 and N_2 by Linde and Caludes process with flow diagram.
- c) Describe the concentration of nitric acid by any two method.

6. Attempt any FOUR of the following:**16**

- a) Describe manufacturing process of water gas.
 - b) Write chemical formula for gypsum and explain its manufacturing process.
 - c) Give the properties and uses of urea.
 - d) Describe the Bosch process of manufacture of hydrogen.
 - e) How will you control pollution in phosphorous industry.
 - f) Describe manufacturing of ammonium nitrate.
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