**11718**

**3 Hours / 100 Marks** Seat No. | | | | | | | | |

***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) Answer any SIX :** **12**

(a) Write reactions involved in manufacturing of sulphuric acid.

(b) State Le-Chatelier's principle.

(c) Describe biuret and write its chemical formula.

(d) List any four types of cement.

(e) Write chemical formula of gypsum.

(f) Write formula of single super phosphate and triple super phosphate.

(g) Name the methods for manufacturing of hydrochloric acid.

(h) Define dry ice. Write its two uses.

**(B) Answer any TWO :** **8**

(a) Write the notations for diaphragm cell and mercury cell.

(b) Draw a process flow-sheet for manufacturing of carbon dioxide from flue gas.

(c) Distinguish between yellow phosphorus and red phosphorus.

**2. Answer any TWO :** **16**

(a) Explain manufacturing process of sulphuric acid with flow diagram.

(b) Describe manufacturing process of urea with reactions and flow diagram.

(c) Explain manufacturing of sodium carbonate by Solvey's process with reactions and flow diagram.

**3. Answer any FOUR :** **16**

(a) Explain manufacturing of triple super phosphate with reaction.

(b) Explain manufacturing of phosphorus pentachloride with reaction.

(c) Distinguish between dry process and wet process in cement manufacturing.

(d) Write reactions involved in manufacturing of water gas and producer gas.

(e) Explain manufacturing of Nitrogen and oxygen by Linde's process.

(f) State properties and uses of sodium hydroxide and chlorine (two each).

**4. Answer any FOUR :** **16**

(a) Write reactions involved in manufacturing of Ammonium sulphate and Ammonium phosphate.

(b) Explain hardening and setting of cement.

(c) Write composition of any two types of cement.

(d) Describe manufacturing of producer gas.

(e) Explain manufacturing of acetylene.

(f) Draw a neat labelled diagram of manufacturing of HC*l* gas by synthesis process.

**5. Answer any TWO :** **16**

(a) Explain manufacturing of Nitric acid with reactions and flow-sheet.

(b) Explain electric arc process for manufacturing of phosphorus. State uses of phosphorus.

(c) Explain manufacturing of hydrogen by natural gas with process flow diagram.

**6. Answer any FOUR :** **16**

(a) Draw PFD for manufacturing of Ammonia.

(b) Explain manufacturing of phosphoric acid by HC*l* leaching.

(c) Explain manufacturing of HC*l* by salt and sulphuric acid process.

(d) Explain working of ammonia converter with neat diagram.

(e) Draw process flow diagram for manufacturing of phosphoric acid by sulphuric acid leaching.

(f) Explain functioning of carbonating tower and ammoniation tower in manufacturing of soda ash.

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