

B.E/B.TECH. Degree Examination, December 2020

Fifth Semester

CH16501- CHEMICAL PROCESS INDUSTRIES I

(Regulation 2016)

Time: Three hours

Maximum : 80 Marks

Answer **ALL** questions

PART A - (8 X 2 = 16 marks)

1. The last step in the Solvay process is
 - a) preparation of ammonical brine
 - b) carbonation
 - c) preparation of carbon dioxide and slaked lime
 - d) recovery of ammonia
2. What is the temperature at II stage convertor in Contact process?
 - a) 200°C
 - b) 250°C
 - c) 300°C
 - d) 450°C
3. Which of the following is not a process involved in glass production?
 - a) Extrusion
 - b) Forming and shaping
 - c) Heat treatment
 - d) Finishing
4. Phosphoric acid is produced in wet process from phosphate rock and
 - (a) dilute H₂SO₄
 - (b) conc. H₂SO₄
 - (c) conc. HNO₃
 - (d) conc. HCl
5. Compare soda glass and lead glass.
6. Justify that accurate quantity of lime should be added during the manufacture of cement.
7. Identify the engineering problems associated with contact process
8. Select suitable techniques to remove Ca and Mg sludge from saturated brine

PART B - (4 X16 = 64 marks)

9. (a) (i) Compare Dual Process and Solvay Process. **(10)**
(ii) Estimate the quantitative requirement of raw materials for the production of 1 ton of soda ash. **(6)**
- (OR)**
- (b) Compare the production of caustic and chlorine using diaphragm cell, mercury cell and membrane cell process. **(16)**
10. (a) Justify that vanadium pentoxide is the preferred catalyst for contact process over platinum along with the process flow diagram. **(16)**

(OR)

- (b) Justify that Finnish process is preferable than Frasch Process for the manufacture of Sulphur. **(16)**
11. (a) Classify the types of cement based on the composition of calcium oxide, silica and alumina. **(16)**
- (OR)**
- (b) (i) Analyze the principle of the mechanical operations involved in the manufacture of refractories. **(10)**
- (ii) Categorize the oxides used in the manufacture of glass. **(6)**
12. (a) Analyze the major engineering problems in the manufacture of phosphoric acid with the process flow diagram and suggest possible solutions. **(16)**
- (OR)**
- (b) Analyze the major engineering problems in the manufacture of urea with the process flow diagram and suggest possible solutions. **(16)**