A **Reg. No. :** | | | | | | | | | | |

Question Paper Code: 53904

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Third Semester

Chemical Engineering

15UCH304-CHEMICAL PROCESS INDUSTRIES - I

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Which of the following is the most adverse factor challenging the choice of mercury electrolytic cell process for the production of caustic soda? CO1- R

   (a) High cost of mercury.

   (b) High specific gravity of mercury

   (c) Non-availability of high purity mercury

   (d) Pollution of water stream by mercury

2. Le-Blanc process is a primitive process for the manufacture of CO1 -R

   (a) Caustic soda (b) Soda ash

   (c) Bromine from sea water (d) Hydrochloric acid

3. Sulphuric acid is mainly used in the _____ industry. CO2- R

   (a) fertiliser (b) steel. (c) paper (d) paint

4. During the manufacturing of sulphuric acid, the temperature of molten sulphur is not increased beyond 160^0C as CO2- R

   (a) It is very corrosive at elevated temperature

   (b) Its velocity is not reduced on further heating (hence pressure drop on pumping it cannot be further reduced

   (c) It decomposes on further increasing the temperature

   (d) None of these

5. Pick out the wrong statement CO3- R

(a) Dry process is used for the manufacturing of cement, when the raw material is blast furnace slag

(b) Portland cement is made employing wet process

(c) Gypsum is added to Portland cement to lengthen its setting time

(d) None of these

6. The type of high refractive index glass used in optical instruments is _____ glass. CO3- R

(a) pyrex (b) flint (c) crookes (d) none of these

7. High purity nitrogen is used in CO4- R

(a) Making protective gas for annealing of cold roll steel strip coils

(b) Fire fighting purposes

(c) Both (a) and (b)

(d) Neither (a) nor (b)

8. Phosphoric acid is prepared from CO4- R

(a) Cryolite (b) Chalcopyrite (c) Rock phosphate (d) None of these

9. Triple superphosphate is manufactured by reacting CO5- R

(a) Phosphate rock with phosphoric acid

(b) Phosphate rock with sulphuric acid

(c) Phosphate rock with nitric acid

(d) Ammonium phosphate with phosphoric acid

10. The minerals of Potassium sulphate are CO5- R

(a) Schonite, Leonite (b) Langbeinite, Polyhalite

(c) Both A & B (d) None of the above

PART – B (5 x 2= 10Marks)

11. List out the major products of Chlor – Alkali Industry. CO1- R

12. What is alum? Name any four types of alum. CO2- R

13. Write a note on Pyrex glass and its uses. CO3- R

14. Write the chemical reaction scheme for the production of Urea. CO4- R

15. Differentiate between super phosphate and triple super phosphate. CO5- R

PART – C (5 x 16= 80Marks)

16.	(a)	Describe the manufacture of soda ash by Solvay process with a neat flow sheet? Give equations and their application.	CO1- U	(16)
		Or		
	(b)	Describe the electrolytic process for the manufacture of caustic soda using mercury cell.	CO1- U	(16)
17.	(a)	Explain in detail about the production of Hydrochloric acid by burning chlorine in hydrogen with a neat flow sheet.	CO2- U	(16)
		Or		
	(b)	With the aid of a neat flow diagram explain the production of Sulphuric acid by contact process in detail.	CO2- U	(16)
18.	(a)	Give a brief account of High alumina cement & Rapid hardening cement and their applications. With a neat flow sheet describe the manufacture of Portland cement from limestone by dry process.	CO3- U	(16)
		Or		
	(b)	Illustrate and explain the manufacture of glass and types of glass.	CO3- U	(16)
19.	(a)	Give a detailed account of operation involved in the production of synthetic ammonia by catalytic reaction with appropriate flow diagram.	CO4- U	(16)
		Or		
	(b)	Describe the production of phosphoric acid from phosphate rock by strong acid process.	CO4- U	(16)
20.	(a)	Draw a flowchart illustrating superphosphate manufacturing process and discuss the steps involved during the large scale production.	CO5- U	(16)
		Or		
	(b)	Write in detail about the production of KCl with neat skech	CO5- U	(16)