

# RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. SIXTH SEMESTER EXAMINATION, MAY 2018

THIRD YEAR [BATCH 2015-18]

INDUSTRIAL CHEMISTRY (Honours)

Date : 28/04/2018

Time : 11 am – 1 pm

Paper : VII [Unit – I & II]

Full Marks : 50

## UNIT-I

(Answer any five questions)

[5×5]

1. With reference to the manufacturing process of sulphuric acid, answer the following :
  - a) Draw the block diagram of the process. [1]
  - b) Write the reaction involved. [1]
  - c) Describe the process. [2]
  - d) Explain why 98%  $H_2SO_4$  is necessary for adsorption of  $SO_3$ . [1]
2. How hydrochloric acid is synthesised using Burner Process? Give chemical reactions and block diagram of the process. How anhydrous HCl is prepared? What is Muriatic acid? [2+1+1+0.5+0.5]
3. Describe the manufacturing process of phosphoric acid in detail. How Uranium is recovered from phosphate rock? [4+1]
4. Describe the urea manufacturing process in detail. Write the names of atleast two fertilizer units in India producing urea. [4+1]
5.
  - a) Differentiate between single and triple super phosphate. [1]
  - b) In labeling of fertilizers the micronutrients are labeled with an 'NPK' value — Explain. [1]
  - c) Discuss the manufacturing process of Ammonium Nitrate in detail and state its uses. [3]
6.
  - a) Write names and formulae of two fertilizers both containing nitrogen and phosphorous and discuss the principles of their manufacturing process. [3]
  - b) Write the classification of fertilizers. How inorganic fertilizer contaminate the soil? [2]
7. Write the names of the material of construction for the following equipments. [1×5]
  - a) Urea reactor
  - b) Prilling tower in urea manufacturing process
  - c) Reactor used in contact process
  - d) Reactor used in Oswald's process
  - e) Oleum storage vessel
8. Write the current scenario of inorganic Heavy chemical industries in India and its future prospect in the context of world scenario. [5]

## UNIT-II

(Answer any five questions)

[5×5]

9.
  - a) Give an account of petrochemical feed stock sources. [3]
  - b) What are the petrochemical products obtained from Xylene? [2]

10. Write the manufacturing process of formaldehyde from methanol in detail. Write its uses. [4+1]
11. a) Laboratory study shows that methanol can be manufactured from synthesis gas using Cu-based catalyst in 1920 but this process is only commercialized in 1966. Explain why? [2]  
b) Discuss the manufacturing process of methanol from synthesis gas in detail. [3]
12. What is oxo-synthesis? Discuss the manufacturing process of butanol via oxo-synthesis in detail. [1+4]
13. Outline the steps involved in the preparation of the following chemicals starting from ethylene and state also their uses.  
a) Ethylene oxide [2·5]  
b) Ethylene glycol [2·5]
14. a) In the manufacture of ethanol amine there is always mono, di and tri ethanol amine produced. How to maximize the monoethanol amine production. [2]  
b) Discuss the manufacturing process of Acrylonitrile. [3]
15. Discuss the BTX production using reforming process in detail (feed stock used, reaction involved, catalyst used, process flow diagram and description). [5]
16. Describe present status and future prospect of Indian Petrochemical industry in world context. [5]

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