Reg. No. : | | | | | | | | | | |

Question Paper Code: 50945

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2017

Fourth Semester

Chemical Engineering

15UCH405 - CHEMICAL PROCESS INDUSTRIES II

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. In sulfate (Kraft) pulp process the essential chemical reagents used in digester are

   (a) $Mg(HSO_3)_2$, Na_2SO_3 and $NaHCO_3$ (b) NaOH, Na_2S and Na_2CO_3
   (c) Na_2SO_4, $Ca(OH)_2$ and $NaHSO_3$ (d) $(CH_3)_2S$, N_2O_4 and SO_2

2. An example for starch derivative is

   (a) glucose (b) dextrose (c) table sugar (d) dextrin

3. The most preferred solvent for the extraction of vegetable oil from seeds is

   (a) hexane (b) formaldehyde (c) hot water (d) methanol

4. Hydrogenation of oil is carried out to

   (a) decrease the melting point of the fat (b) reduce its resistance to rancid oxidation
   (c) remove double bonds (d) increase the degree of unsaturation

5. Catalytic reforming process improves the _____ of the petroleum products.

   (a) iodine number (b) linear structure
   (c) boiling point (d) octane rating

6. One of the method used for acetylene production is

   (a) partial combustion of hydrocarbons (b) electrolysis of brine solution
   (c) beneficiation of limestone (d) ammonium carbonate decomposition

7. Phenol-formaldehyde resin is an _____ material.

(a) thermoplastic (b) elastomer type
(c) thermosetting plastic (d) polymeric fiber

8. _____ is used as common vulcanizing agent during rubber production.

(a) 5% carbon (b) 3% sulfur (c) 6% chlorine (d) 2% nitrogen

9. Polymers formed by condensation of poly functional acids with poly functional alcohols are called

(a) polyesters (b) polyamides (c) viscose rayon (d) natural rubber

10. The principal raw material required for the production of viscose rayon fiber is

(a) butadiene (b) polyethylene (c) epoxy monomer (d) cellulose

PART - B (5 x 2 = 10 Marks)

11. List out the major steps involved in the recovery of chemicals from sulfate pulp digestion liquor?

12. What are detergents?

13. List out any three industrial uses of acetylene.

14. Differentiate between thermosetting and thermoplastic materials.

15. How polyethylene is prepared? Write the chemical reactions involved?

PART - C (5 x 16 = 80 Marks)

16. (a) Explain the preparation of wood pulp by Kraft sulfate process with a neat diagram. Mention the characteristics of the pulp and summarize the typical paper products obtained from sulfate pulp. (16)

Or

(b) With a neat flow chart, describe the steps involved in the large scale manufacture of sugar. List out the major problems faced during production. (16)

17. (a) With a flow chart, discuss the commercial scale production of vanaspati by hydrogenation of vegetable oil process. (16)

Or

(b) Explain the processing steps in "continuous hydrolysis-saponification method" for the industrial scale production of soap. (16)

18. (a) (i) Discuss the various products obtained during crude petroleum refining operation. Identify their characteristics and commercial uses. (10)

(ii) How lubrication oils are prepared? List out the various additives used to improve the quality of lube oil. (6)

Or

(b) Explain the manufacturing steps in hydro-deal kylation process to make benzene from toluene. (16)

19. (a) Discuss the methodology and uses of following processes in polymer manufacturing unit: bulk polymerization and solution polymerization. (16)

Or

(b) Describe the method of production for Butadiene – Styrene rubber with a reference flow chart. List out the industrial applications. (16)

20. (a) Enumerate the chemical reactions and process steps in Nylon – 6, 6 production with a neat flow chart. (16)

Or

(b) Discuss the basic chemistry of viscose process and explain the viscose rayon production from cellulose wood pulp with the help of flow diagram. (16)

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