CHEMICAL PROCESS TECHNOLOGY - II
(CHEN 3203)

Time Allotted : 3 hrs **Full Marks : 70**

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and any 5 (five) from Group B to E, taking at least one from each group.

Candidates are required to give answer in their own words as far as practicable.

Group – A
(Multiple Choice Type Questions)

1. Choose the correct alternative for the following: **10 × 1 = 10**

(i) Which of the following is a detergent?
(a) Fatty alcohol (b) Linear Alkyl Benzene Sulfonate
(c) Fatty acids (d) Methylene chloride

(ii) Fermentation of molasses is an
(a) Anaerobic process (b) Endothermic process
(c) Aerobic process (d) Exothermic process

(iii) Solvent used for the extraction of oil is
(a) Hexane (b) Methyl ethyl ketone
(c) Furfural (d) Toluene

(iv) Fumigant insecticides
(a) Kill insects when they eat it (b) Emit poisonous vapour
(c) Are absorbed through the plant (d) Destroy the respiratory system

(v) Soap is
(a) Fatty acids
(b) Fatty alcohols
(c) Salts fatty acid derivatives of alkali metals
(d) Salts of fatty alcohol derivatives of alkali metals

(vi) Yellow glycerine is a by-product of
(a) Soap production (b) Detergent production
(c) DDT production (d) Vegetable oil extraction

(vii) DDT represents
(a) Synthetic organic pesticides (b) Food preservatives
(c) Oil additives (d) Raw materials of paper industry

(viii) Halogenation of organic compounds is most exothermic in case of
(a) Chlorination (b) Fluorination
(c) Iodination (d) Bromination

(ix) Hydrogenation of edible oils is carried out in the presence of finely divided
(a) Activated copper (b) Activated nickel
(c) Activated iron (d) Activated silver.

(x) Raw materials of Nylon 6, 6 are
(a) Caprolactum (b) Caprolactum and methanol
(c) Hexamethyl diamine and adipic acid (d) Adipic acid and caprolactum

Group – B

2. (a) Discuss in detail the solvent extraction method of vegetable oil with the help of a neat flow diagram.

(b) Briefly describe the chemical interesterification method.

8 + 4 = 12

3. Attempt any three of the followings
(i) Write the chemical reactions involved in glycerine production through acrolein route.
(ii) Discuss the major engineering problems associated with hydrogenation of oil.
(iii) Write the chemical reactions involved in nickel catalyst preparation.
(iv) Differentiate the chemical and enzymatic interesterification method with the help of block diagrams.

(3 × 4) = 12

Group – C

4. Write in brief the following related to sugar production from sugarcane bagasse:
(i) Mechanisms of clarifier unit
(ii) Major engineering problems
(iii) Block diagram of sugar refining process

(5 + 4 + 3) = 12

5. (a) Describe the manufacturing process of absolute alcohol production with the help of neat flow sheet.

(b) Write a short note on insecticides.

(c) What is eco-poisonous circulation of DDT?

6 + 4 + 2 = 12

Group – D

6. (a) What are the advantages of fluidized bed reactor over fixed bed reactor in the manufacturing process of phthalic anhydride?

(b) Why is demand of butadiene so high and how it is fulfilled by different commercial methods of production?

(c) Mention the different major uses of ethylene oxide and narrate the processes followed in different routes of manufacturing it.

3 + 3 + 6 = 12

7. (a) Describe the manufacturing process of phenol from cumene route with help of a neat flow sheet.

(b) What are the different nitrating agents used for different types of organic compounds as substrate?

10 + 2 = 12

Group – E

8. (a) What are the chemical reactions involved in the manufacturing process of phenol-formaldehyde resin? Give a brief description of the Commercial manufacturing methods.

(b) Differentiate the bulk polymerization and solution polymerization.

6 + 6 = 12

9. Write short notes on any *three* of the followings **(3 × 4) = 12**

(i) Emulsion polymerisation
(ii) flow sheet of LDPE production
(iii) SBR production Process
(iv) Block diagram of Nylon 6,6 production.

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