E 286

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2003.

Third Semester

Chemical Engineering

(Common to : Leather Technology, Textile Chemistry, Textile Technology)

CH 236 — ORGANIC CHEMISTRY

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Give one example each for a monosaccharide and a polysaccharide.

2. Name the two solvents used in the preparation of a Grignard reagent.

3. Define Iodine value of an oil.

4. Write down the structural formulae of the following compounds :

   Isonicotinic acid

   Piperidine.

5. Define a chromophore and an auxochrome.

6. What is meant by a prosthetic group? Give an example for a Chromoprotein.

7. Which compound exhibits structural resemblance to Para Amino Benzoic acid leading to prevention of growth of bacteria?

8. List the Four classifications of Waxes.

9. How is Pyrrole–2–aldehyde prepared from Pyrrole?

10. How does Glucose react with Fehling's solution? How many optically active isomers of glucose are possible?

PART B — (5 × 16 = 80 marks)

11. (i) Calculate the Free Acid value of the given sample of oil from the following data :

Weight of the oil taken = 5.5 grams

Amount of Potassium Hydroxide used = 6 ml

Strength of Potassium Hydroxide used = 0.1 N. (10)

(ii) Write down the structural formulae of the products formed in the following reactions

(1) Fructose and Hydrogen Cyanide

(2) Sucrose and Concentrated Hydrochloric acid

(3) Glucose and Bromine Water. (2 + 2 + 2 = 6)

12. (a) (i) Which compound is responsible for the offensive odour, during the decay of a protein, by oxidation? (3)

(ii) Enumerate the principles involved in the sedimentation method and the light scattering method of determination of molecular weight of a protein. (4 + 4 = 8)

(iii) Describe the Ninhydrin test for the detection of a protein. (5)

Or

(b) How are the following compounds prepared from a suitable Grignard reagent?

(i) Butyric Acid

(ii) Normal Pentyl Alcohol

(iii) Isopropyl Alcohol

(iv) Tertiary Butyl Alcohol. (4 × 4 = 16)

13. (a) (i) Write down the structural formulae of the following Heterocyclic compounds

(1) Tryptophan

(2) Pyrrole–2–Carboxylic acid

(3) Furyl–2–Cinnamic acid

(4) 2–Phenyl Pyridine. $(4 \times 2 = 8)$

(ii) Describe the Chichibabin reaction of Pyridine. (4)

(iii) How is Furfural converted into Furan? (4)

Or

(b) How are the following conversions carried out? Write down the structural formulae of the reactants and product formed in the above conversions

(i) Pyrrole to 2–(Phenylazo) Pyrrole

(ii) Thiophene to 2–Benzoyl thiophene

(iii) Pyridine to 3–amino pyridine

(iv) Indole to Gramine. $(4 \times 4 = 16)$

14. (a) (i) How is Catechol converted into Alizarin? (4)

(ii) How is Schiff's reagent prepared? Which functional group in an organic compound can be detected using the above reagent? $(4 + 2 = 6)$

(iii) Account for the following :

(1) Intense colour of the Malachite green dye

(2) Extreme reactivity of Para Hydrogen atom in Dimethylaniline. $(2 \times 3 = 6)$

Or

(b) (i) What are the starting materials used in the preparation of the following dyes?

(1) Malachite green

(2) Eosin

(3) Congo Red. $(3 \times 3 = 9)$

(ii) How are Natural Dyes classified based on the source of their occurrence? Which fibre has a special affinity for madder natural dye? $(3 + 1 = 4)$

(iii) Which groups in a fibre react with a reactive dye to form a covalent bond? (3)

15. (a) (i) How is Sulphapyridine prepared from 2-aminopyridine? (10)

(ii) On what basis sulpha drugs are classified? Against which type of bacteria sulphonamides are active? (2 × 2 = 4)

(iii) Which Quinoline derivative is used in the preparation of Chloroquine, an antimalarial drug? (2)

Or

(b) (i) How is Isopentaquine synthesised? (6)

(ii) How is Acetanilide converted into sulphanilamide? (8)

(iii) How are sulphonamides estimated? (2)