



EASTERN UNIVERSITY, SRI LANKA
THIRD EXAMINATION IN SCIENCE
FIRST SEMESTER - 2003/2004 (Proper)
CH 301 CHEMISTRY OF NATURAL PRODUCTS

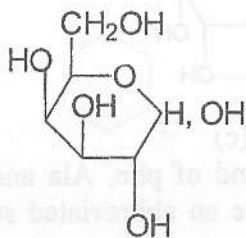
Answer All Questions.

Time: 01 Hour

(1) Answer all three parts (a), (b) and (c).

(a). Draw the Fischer projection of fructose, glucose and galactose sugars having the D-configuration.

A non reducing trisaccharide **P** on complete hydrolysis gives D-fructose, D- glucose and D-galactose as the products. Hydrolysis of **P** with a β - fructosidase gives a reducing disaccharide **Q** and D-fructose. Treatment of **P** with an α - glycosidase gives a non-reducing disaccharide **E** and D-galactose. Complete methylation of **P** followed by hydrolysis with dilute acid gives 2,3,4,6-tetra-O- methyl galactose, 2,3,4 - tri-O- methyl glucose and 1,3,4,6- tetra -O-methyl fructose as products. The disaccharide **Q** when treated with methanol in the presence of HCl gives a compound **F**. Deduce the structures of the compounds **P**, **Q**, **E** and **F**, explaining all the above observations.



D - galactose

(b) (i). Treatment of D-glucose with methanol in the presence of gaseous hydrogen chloride yields mixture of α - and β - methyl glycosides in which the α - anomer predominates. Explain.

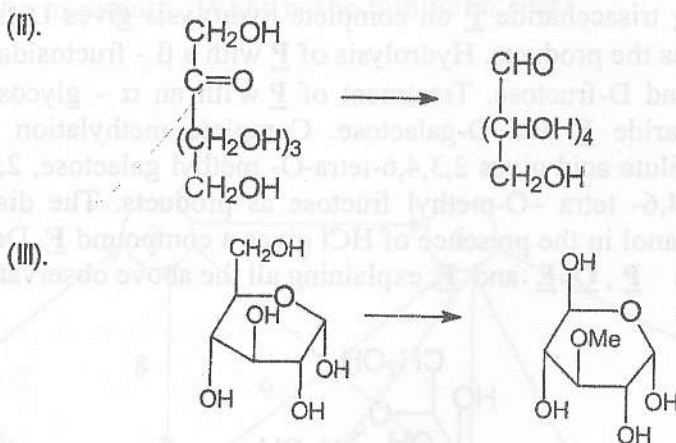
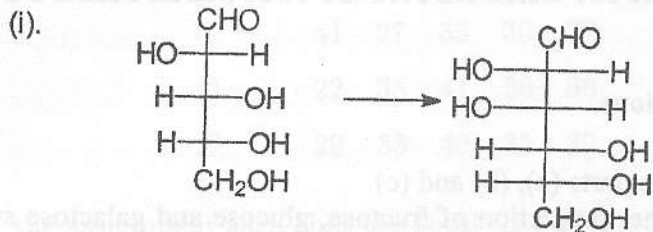
(ii). Complete the following reactions of D-ribose with each of the following reagents by supplying a Fischer projection for each organic product formed (mechanism are not required).

a. HNO_3

b. Excess pHNNH_2

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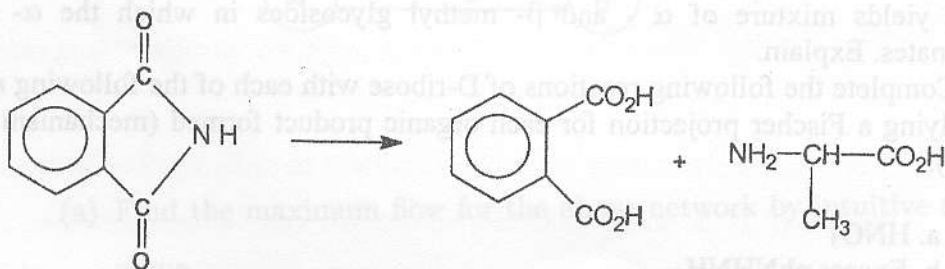
(c). Show, by means of equations, how two of the following conversions may be effected. Give essential experimental conditions only.



(2). Answer all three parts (a), (b) and (c)

(a). (i) Consider a tripeptide compound of phe, Ala and Gly. How many isomers are possible for the tripeptide? Write an abbreviated structural formula (three letters) for each tripeptide.

(ii) Indicate by means of equation, how the following transformation may be effected.



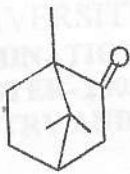
(b) Explain the following observations.

(i). When pure crystalline amino acids are heated, decomposition generally occurs before melting.

(ii). Aqueous solution of amino acids are buffered solutions.

Contd

(c) (i). Outline a method of synthesis of camphor starting from camphoric acid



camphor

(ii) Write down the structure of cholesterol and explain two colour reactions specific for it.

(iii). By means of equations, show how the following conversions could be effected. Give essential experimental conditions only.

