EASTERN UNIVERSITY, SRI LANKA.
THIRD EXAMINATION IN SCIENCE- 2005/2006 - REPEAT
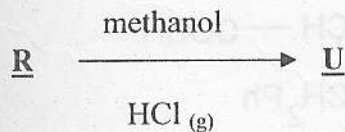## FIRST SEMESTER (SEPTEMBER 2007)
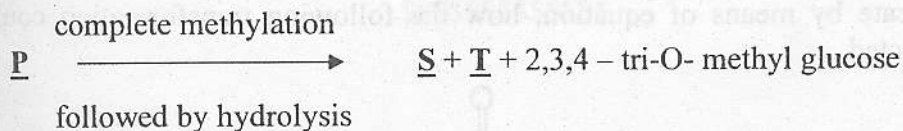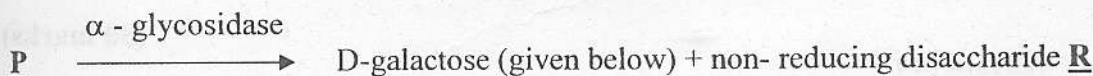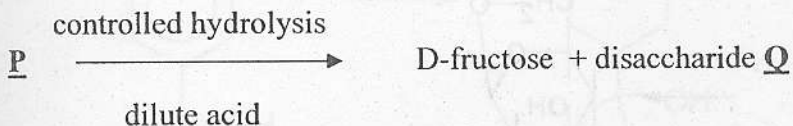## CH 301 CHEMISTRY OF NATURAL PRODUCTS

Time allowed: **ONE Hour**

Answer all the questions

The use of a non-programmable calculator is permitted

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

   A non reducing trisaccharide **P** occurs in many plants, particularly beet. The following reactions are observed.

   $$\textbf{P} \xrightarrow[\text{dilute acid}]{\text{controlled hydrolysis}} \text{D-fructose + disaccharide } \textbf{Q}$$

   $$\textbf{P} \xrightarrow{\alpha\text{ - glycosidase}} \text{D-galactose (given below) + non- reducing disaccharide } \textbf{R}$$

   $$\textbf{P} \xrightarrow[\text{followed by hydrolysis}]{\text{complete methylation}} \textbf{S} + \textbf{T} + 2,3,4 - \text{tri-O- methyl glucose}$$

   $$\textbf{R} \xrightarrow[\text{HCl}_{(g)}]{\text{methanol}} \textbf{U}$$

   Deduce the structure of the compounds **P**, **Q**, **R**, **S**, **T**, **U** and explaining all the above observations.
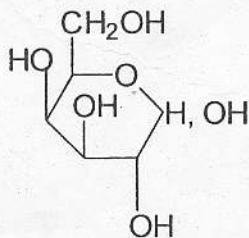
D-galactose

(40 marks)

1

(b) **i.** Show how D- glucose forms an osazone upon reaction with an excess of Phenyl hydrazine (PhNHNH$_2$) (write the mechanism of the reaction).

    ii. Why do glucose and fructose form the same osazone when they are allowed to react with C$_6$H$_5$NHNH$_2$?

(30 marks)

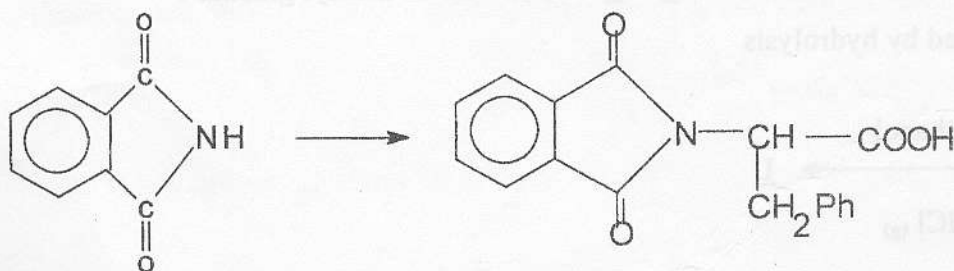**(c)** Indicate by means of equations show how the following conversions could be effected. Give essential experimental conditions.

1. Glucose ⟶

2. Glucose ⟶

(30 marks)

2. (a) (i) Explain why an aqueous solution of amino acids function as buffered solution.

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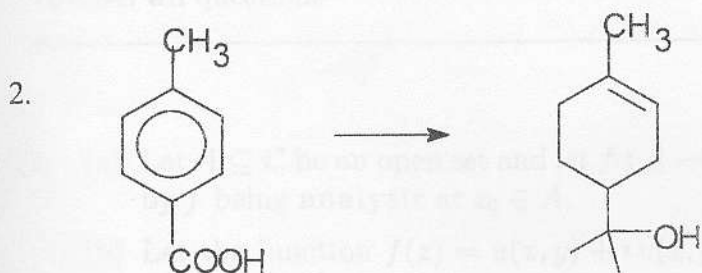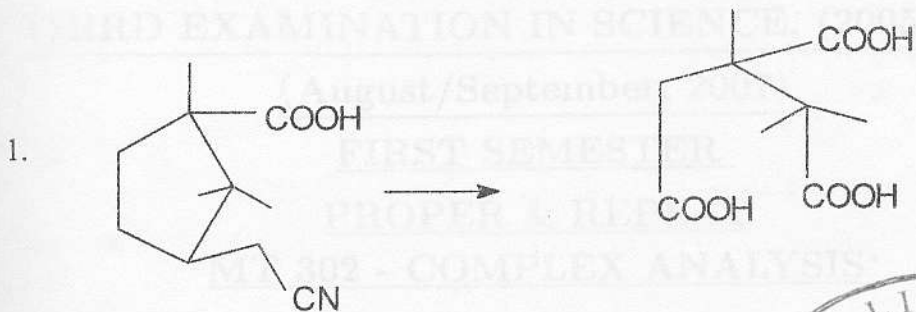

(40 marks)

(b) Show how Phenyl isothiocyanide (Ph-NCS) could be used to determine the N-terminal residue in a peptide.

(20 marks)

(c) (i) Out line one method to synthesis menthol.

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

1.

2.

(40 marks)

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