

EASTERN UNIVERSITY, SRI LANKA
 EXTERNAL DEGREE IN SCIENCE
 THIRD EXAMINATION IN SCIENCE 1996/1997 (RE-REPEAT)
 EXCH 301 NATURAL PRODUCTS, HETEROCYCLIC CHEMISTRY AND
 REARRANGEMENT REACTIONS (June-Aug. 2004)

TIME: 03 HOURS

ANSWER SIX QUESTIONS

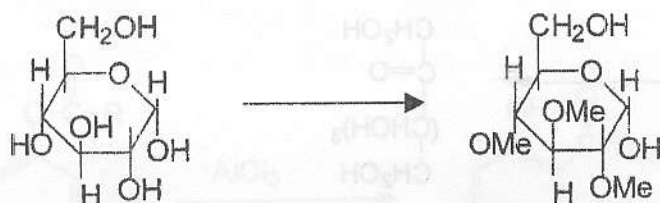
1. (I) What is meant by muta rotation of Glucose

(II) By means of equations show how the following transformations may be effected. Give essential experimental conditions

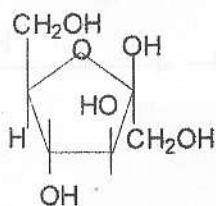
(i)



(ii)



(III). The disaccharide X occurs in yeast and fungi. It does not react with Fehling's solution or Tollen's reagent. When heated with dil. HCl (or on hydrolysis) one mole of α -D-glucose and one mole of β -D-fructose were formed. Write the possible structure(s) of the compound X



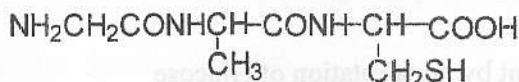
(β - D - Fructose)

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(2). (I). Draw the structures of the following disaccharides and indicate the type(s) of the linkage in it.

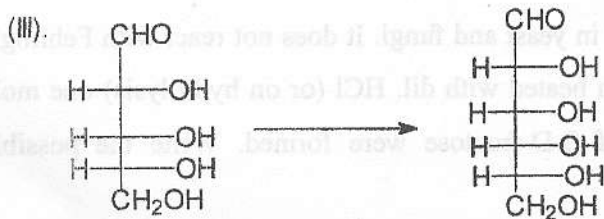
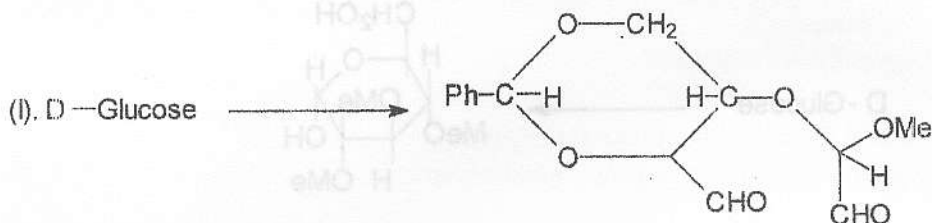
- (i). Cellulose
- (ii). Lactose
- (iii). Maltose

(II). Show how the tri peptide glycylalanyl cystine (I) can be synthesised starting with individual amino acids.



(I)

(3). By means of equations show how **TWO** of the following transformations may be effected. Give essential experimental conditions.

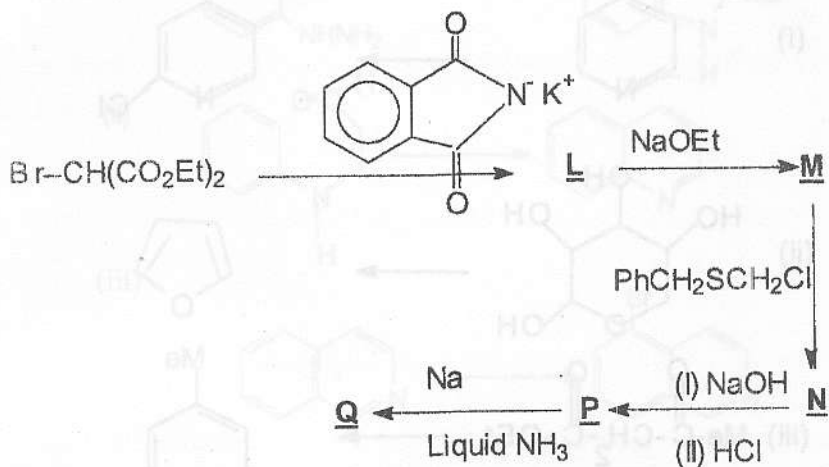


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(4). (I). Give three examples of amino protecting groups used in peptide synthesis.

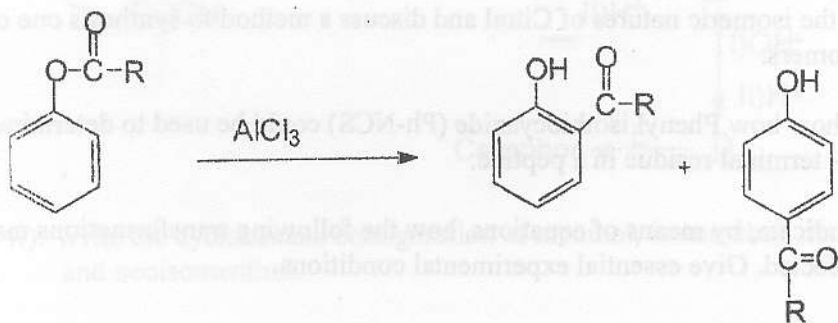
(II). The amino acid **Q** was prepared by the sequence of reactions given below.

In this sequence **L**, **M**, **N**, **P** and **Q** are the main products. Identify and write the structures of the compounds **L**, **M**, **N**, **P** and **Q**

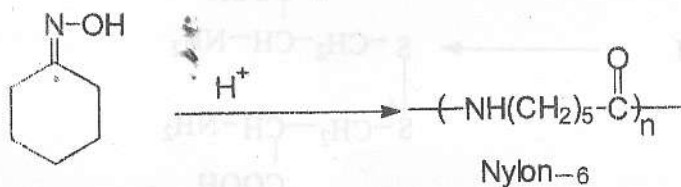


(5). Explain the following observations

(I).

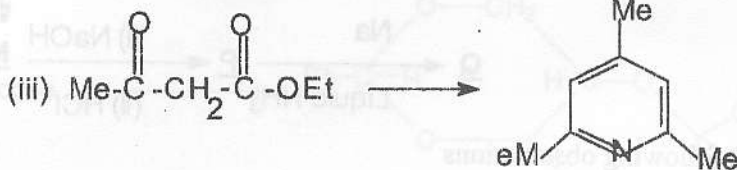
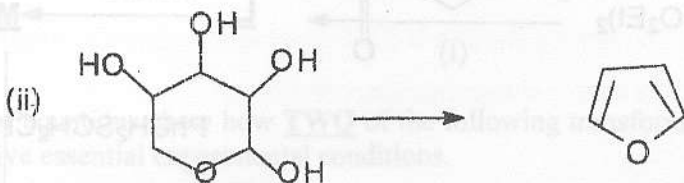


(II).



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(6). By means of equations show how **TWO** of the following transformations may be effected. Give essential experimental conditions.

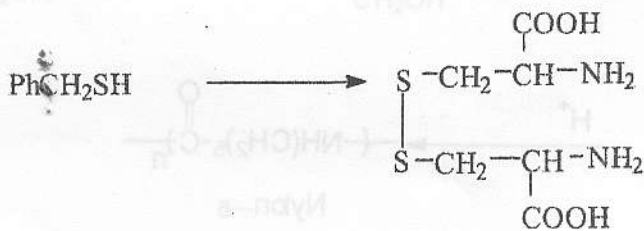


(7). Answer all parts (a) and (b)

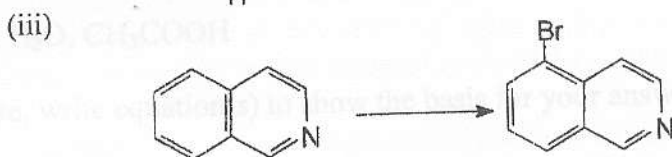
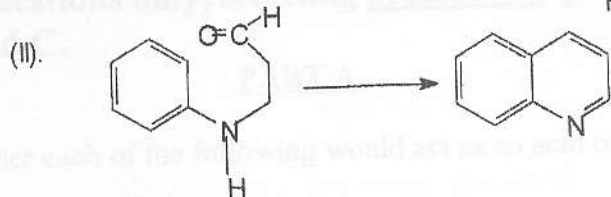
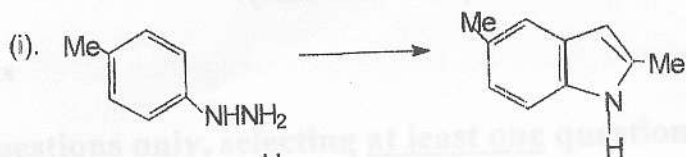
(a). Give the isomeric natures of Citral and discuss a method to synthesis one of its isomers.

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

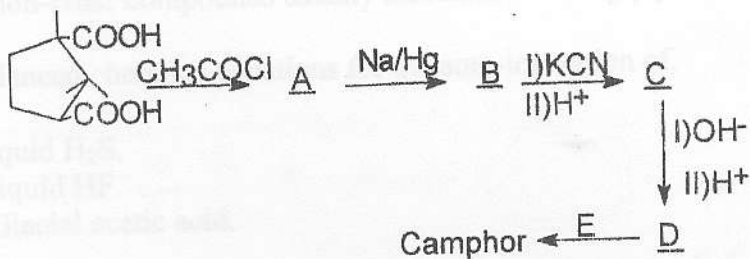
(ii). Indicate, by means of equations, how the following transformations maybe effected. Give essential experimental conditions.



(8). Indicate by means of equations how the following conversions may be effected. Give essential experimental conditions. Suggest plausible mechanisms for **TWO** of the reactions involved below.



(9). (I). Complete the scheme by inserting missing structures and reagents



II). Write the cyclohexane configuration of menthol, isomenthol, neomenthol and neoisomenthol.
