

This question paper contains 4 printed pages.]

Your Roll No.

1244-A

B.Sc. (H) / II Sem.

A

**(Also common for Botany, Zoology,
Microbiology Courses)**

Paper – CHCT-402

Chemistry-II

(New Course : Admission of 2010 and onwards)

Time : 3 Hours

Maximum Marks : 75

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt any six questions, including question number one, which is compulsory.

1. (a) Glucose, fructose and mannose yield the same osazone when excess phenyl hydrazine is used. Explain.
- (b) What are zwitter-ions ? Define the iso-electric point of an amino acid.
- (c) Although p-hydroxy benzoic acid is less acidic than benzoic acid, salicylic acid (o-hydroxy benzoic acid) is fifteen times more acidic than benzoic acid. Explain.
- (d) Write the structural formula of (R)(Z)-2-chloro-3-heptene. 4, 3, 4, 4

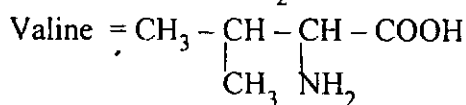
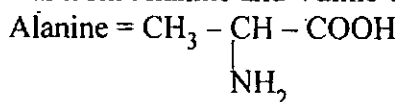
2. (a) Carry out the following conversions :
- D-Arabinose to D-Glucose
 - D-glucose to D-Arabinose
 - D-Glucose to D-Fructose
- (b) What is invert sugar ? Why is it so named ?

3, 3, 3, 3

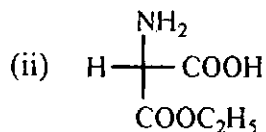
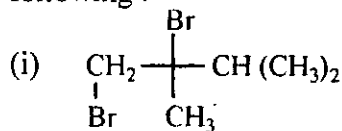
3. (a) Use the Sanger reagent, DNFB to distinguish between Phe-Gly and Gly-Phe. Give the reactions involved.
- (b) What are Proteins ? What do you understand by primary, secondary and tertiary structures of proteins ?

6, 6

4. (a) What is the difference between Anomers and Epimers ? Explain with examples.
- (b) How will you synthesise the dipeptide Ala-Val from Alanine and Valine ?



- (c) Designate as R/S configuration of the following :



3, 6, 3

5. (a) Account for the following observations :
- (i) In the gas phase the order of increasing basicity is
- $$\text{NH}_3 < \text{CH}_3\text{NH}_2 < (\text{CH}_3)_2\text{NH} < (\text{CH}_3)_3\text{N}$$
- (ii) In water the order is
- $$\text{NH}_3 < \text{CH}_3\text{NH}_2 \approx (\text{CH}_3)_3\text{N} < (\text{CH}_3)_2\text{NH}$$
- (b) Arrange the following in the increasing order of stability. Give reasons for your answer :
- (i) $(\text{CH}_3)_3\text{C}^\ominus$
- (ii) $(\text{CH}_3)_2\text{CH}^\ominus$
- (iii) $\text{CH}_3\text{CH}_2^\ominus$
- (iv) CH_3^\ominus
- (c) Explain why o-Nitrophenol is less acidic than p-Nitrophenol. 6, 4, 2
6. (a) Write the Fischer's projections for all the possible stereoisomers of 2,3-Dichlorobutane. Indicate their optical activity and how they are related to each other. Write R/S configuration of any one of them.
- (b) Draw the Newman projection formulae for the chair and boat conformations of Cyclohexane and explain, giving reasons, which conformation is more stable. 6, 6

7. Write short notes on
- (a) Electrophoresis as a method for separation of Amino Acids.
 - (b) Muta rotation
 - (c) Use of Ninhydrin in the detection of Amino acids in the laboratory. Give the chemistry of the test also. 4, 4, 4
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