REV-01
BSC/05/10

2024/11

SET A

B.Sc. CHEMISTRY
THIRD SEMESTER
ORGANICCHEMISTRY-II
BSC - 302
[USE OMR FOR OBJECTIVE PART]

Duration: 1:30 hrs. **Full Marks: 35**

(Objective)

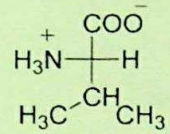
Time: 15 mins. **Marks: 10**

Choose the correct answer from the following: ***1×10=10***

1. An example of non-essential amino acid is
   a. Alanine b. Lysine
   c. Valine d. Histidine

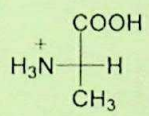
2. For the synthesis of alanine, the α-keto acid needed in trans amination process is
   a. α-keto isovaleric acid b. α-keto valeric acid
   c. α-keto glutaric acid d. pyruvic acid

3. The name of the following amino acid is

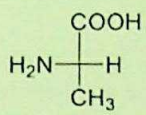


   a. Glycine b. Serine
   c. Valine d. Aspartic acid

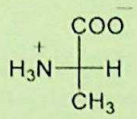
4. Which of the following is the major structure alanine at pH < 2?



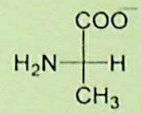
(I)



(II)



(III)



(Iv)

   a. Structure (I) b. Structure (II)
   c. Structure (III) d. Structure (IV)

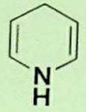
5. During acetylation of glycine in presence of NaOH, the product obtained is
   a. Aceturic acid b. Barbituric acid
   c. Hippuric acid d. Glyceric acid

6. Triethylamine is a
   a. 2° Amine b. 3° Amine
   c. 1° Amine d. 0° Amine

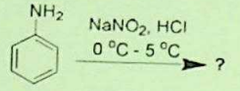
7. Which of the following is the most acidic nitro compound?
   a. Nitroethane
   b. Nitrobenzene
   c. Nitromethane
   d. 2-Nitrophenol

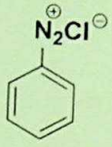
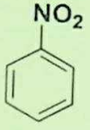
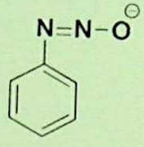
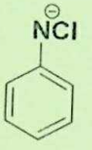
8. Which of the following compound is an example of isonitrile compound
   a. C_2H_5CONHR
   b. C_2H_5COOH
   c. C_2H_5NC
   d. C_2H_5CN

9. Identify the structure of pyridine

   a. 
   b. 
   c. 
   d. 

10. What is the product of the following reaction



   a. 
   b. 
   c. 
   d. 

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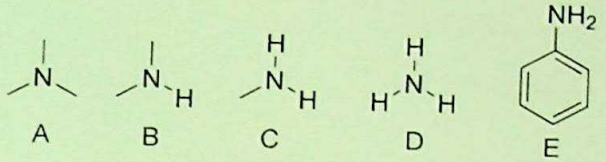
Descriptive

Time : 1 hr. 15 mins. Marks: 25

[Answer question no.1 & any two (2) from the rest]

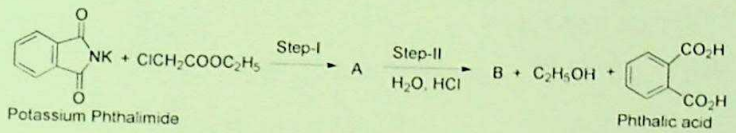
1. **a.** What are essential and non-essential amino acids? Explain with examples. 3+2= 5

   b. Arrange the following amines in order of their basic character



2. **a.** Draw the D- and L-structure of alanine. Which structure is important in protein synthesis? 3+3+4 =10

   b. Complete the following reaction with products A and B and write the name of the product B



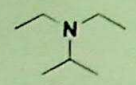
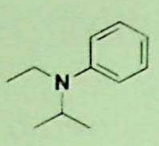
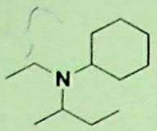
   c. What is trans amination? Using this method how will you prepare valine? Explain with chemical reaction.

3. **a.** What is benzoylation of glycine? Why this reaction is carried out in presence of NaOH? Write all the reactions involved in benzoylation of glycine and name the product formed. 3+4+3 = 10

   b. What are the products formed when glycine separately reacts with (i) HNO_2 and (ii) NOCl? Write the chemical reactions involved.

   c. Draw the structure of ninhydrin. How will you detect the presence of α-amino acid with this reagent? Write the reaction.

4. **a.** Deduce IUPAC nomenclature of the following compounds 2+2+4 +2=10

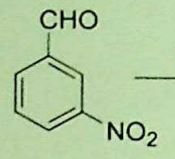
(i)  (ii)  (iii) 

b. Why amine compound exhibits pyramidal shape? What is the bond angle in amine.

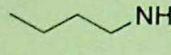
c. How does the reaction with Hinsberg's reagent differentiate primary, secondary, and tertiary amines?

d. Write down the products of the following reaction

(i) $CH_3NO_2 \xrightarrow{Zn/NH_4Cl}$ product

(ii)  $\xrightarrow{TiCl_3}$ product

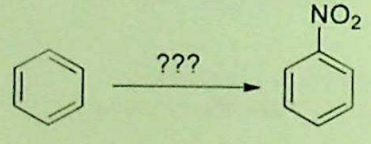
5. **a.** What are the products of the following reaction? Give detailed mechanism 4+4+2 =10

 $\xrightarrow[(ii)\ Ag_2O/H_2O]{(i)\ Excess\ CH_3I}{(iii)\ Heat}$ Products

b. Write down the product and give the detailed mechanism of hydrolysis of nitriles

$CH_3\text{-}CN \xrightarrow[(ii)\ Heat]{(i)\ H_2O/H^+}$ Product

c. What is the reagent used in the following reaction? Deduce the detailed mechanism.



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