

**B.S.C. BOTANY
SEMESTER-3RD
ORGANIC, INORGANIC AND PHYSICAL THEORY
BSC-731**

Duration: 3 Hrs.

Marks: 70

Part : A (Objective) = 20

Part : B (Descriptive) = 50

[PART-B : Descriptive]

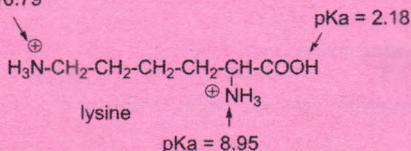
Duration: 2 Hrs. 40 Mins

Marks: 50

[Answer question no. One (1) & any four (4) from the rest]

1. i. Calculate the isoelectric point (pI) of the following amino acid

pKa = 10.79



2+2+3+3=10

ii. Why carboxylic acids can exist as dimers?

iii. Define chelates and discuss formation of chelates in living system.

iv. What happens when a drop of HCl is added to a mixture of sodium acetate and acetic acid?

2. i. What will be the products formed when D-Glucose is reacted with

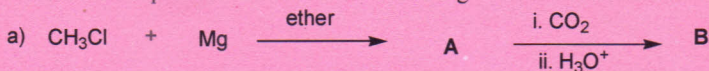
a. NaBH₄ b. Bromine water c. H₂N-NH-C₆H₅

ii. What is Wohl degradation method? Explain with examples.

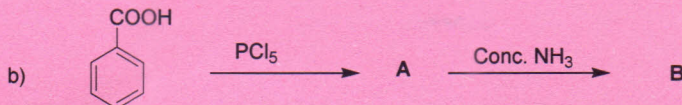
iii. What is meant by mutarotation? Explain how D-glucose can undergo cyclization in their aqueous solutions. What will be the product formed when α-D-Glucose is treated with excess of (CH₃CO)₂O in presence of pyridine?

3+3+4=10

3. i. What are the products formed in the following chemical reactions



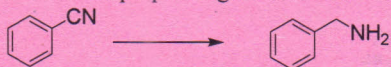
2+3+5=10



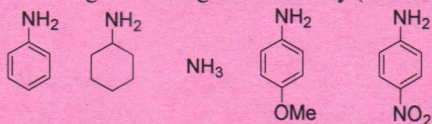
ii. What are carbohydrates and how they are classified? Explain with examples.

iii. Define fat and oil. What is saponification of oil? Discuss about the chemical essence of the soap and the detergent.

4. i. Write the proper reagent of the following transformation

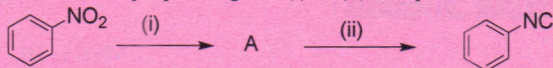


- ii. Arrange according to the basicity (decreasing order).



- iii. How to identify the primary, secondary and tertiary amines. Explain

- iv. Write the proper reagents (i) & (ii) and product 'A' of the following reaction



5. i. Explain the factors affecting the magnitude of CFS. Define optical isomerism and mention the conditions necessary to show optical isomerism.

3+3

- ii. Discuss minerals and ores with examples. Define metallurgy.

4

6. i. Write down the nomenclature of the following compounds



2

- ii. Define atomic radius and express the relationship between single, double and triple bonds.

3

- iii. Describe ionization enthalpy. Define Electron affinity and discuss variation of electron affinity in a period

3+2

7. i. Explain the osmotic pressure method for the determination of molar mass of a solute. What is the advantage of this method over other methods?

5

- ii. What are abnormal molar mass and van't Hoff factor? Relate van't Hoff factor to the degree of dissociation and association?

5

8. i. Define buffer capacity. Derive Henderson-Hasselbalch equation.

5

- ii. Define Kohlrausch's law. How it is used to determine the value of λ_{∞} of acetic acid?

5