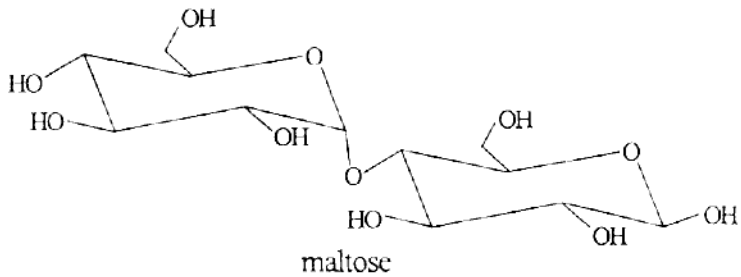
**M.Sc. (Semester—III) (CBCS) Examination**
**CHEMISTRY (Old)**
**(Organic Chemistry—II)**
**(Natural Product—I)**
**Paper—XII**

Time : Three Hours] [Maximum Marks : 80

**Note :—** (1) **All** questions are compulsory.
(2) All questions carry equal marks.

1. (A) What are monosaccharides ? What happens when glucose and fructose are treated with following :
   (i) Bromine water
   (ii) Nitric acid
   (iii) Benedict's reagents ? 6
   (B) Discuss the general method of structure determination of sucrose. 5
   (C) The structure of maltose is given below :




maltose

   (i) Label the acetal and hemiacetal carbons.
   (ii) What products are formed when maltose is treated with each of the following :
      (a) $H_3O^+$
      (b) $CH_3OH$ and HCl
      (c) Excess NaH, then excess $CH_3I$. 5

**OR**

   (P) Write notes on the following :
      (i) Natural sugar
      (ii) Amino sugar. 6
   (Q) How will you establish the structure of α-amylose ? 5
   (R) What happens when glucose and fructose are treated with phenylhydrazine ? 5

2. (A) Give the synthesis of phenylalanine and proline. 6
   (B) Discuss acid-base properties of amino acids. Why are amino acids called amphoteric compounds ? 5
   (C) What are prostaglandins ? Discuss their physiological effect. 5

**OR**

(P) Discuss the general principles of polypeptide synthesis. 6

(Q) Explain the double helix structure of DNA. 5

(R) Write in brief on :

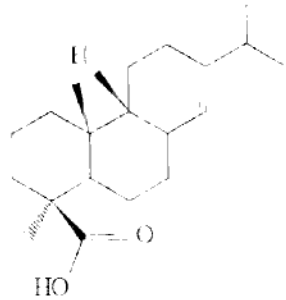
(i) Isoelectric point in amino acids

(ii) Amino end degradation by Dansyl method. 5

3. (A) Give any one method for synthesis of morphine. 6

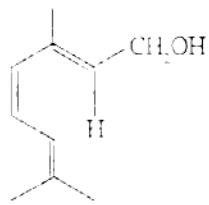
(B) What are the functions and properties of alkaloids ? 5

(C) Identify the given structure and give its synthesis : 5




**OR**

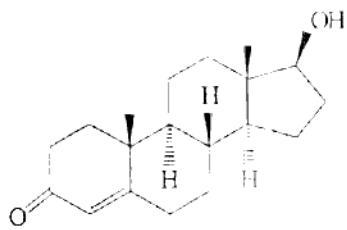
(P) Identify the structure and how will you synthesize it from 4-bromo-2-methyl-2-butene ? 6




(Q) Give the synthesis of 1-(3,4-dimethoxybenzyl)-6,7 dimethoxyisoquinoline. 5

(R) What are alkali-likes ? Give the classification of alkaloids with example. 5

4. (A) Identify the following structure and give is synthesis :




6

(B) What are amino acids ? Give the biosynthesis of phenylalanine. 5

(C) What are hormones ? Give their classifications and examples. 5

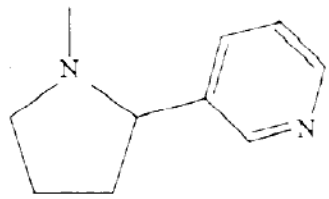
**OR**

(P) Discuss on following :

(i) Position of the angular methyl group.

(ii) Nature and position of the side chain. 6

(Q) Identify the following structure and give its biosynthesis starting from glycerol and aspartic acid :




5

(R) Explain in detail Diel's hydrocarbonation. 5

5. (A) Explain the terms chromophore, Auxochrome and chromogen. To which class of dyes alizarin belongs ? Give its synthesis and mode of applications to fibres. 6

(B) Give the synthesis of ethyl red. Also discuss its applications. 5

(C) What are dyes ? Explain in brief the requirements for a compound to be a dye. 5

**OR**

(P) Write a note on the following with examples :

(i) Vat dying

(ii) Direct dying. 6

(Q) Discuss dispersive dying with examples. 5

(R) Give the synthesis of indigotin from o-nitrophenylpropionic acid. 5