

B.Sc. 5th Semester (Honours) Examination, 2021 (CBCS)

Course Title: Organic Chemistry-V

Course Code: CC-12

Time: Two Hours

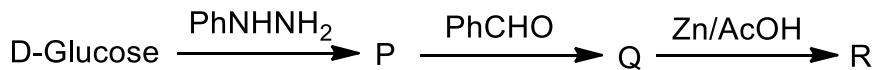
Full Marks: 40

The figures in the margin indicate full marks

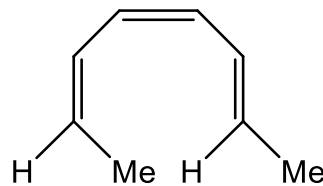
Candidates are required to give answers in their own words as far as practicable

Answer any eight questions from the following $5 \times 8 = 40$

1. Why is cane sugar a non-reducing disaccharide? Show the steps and name the reaction for the overall process:

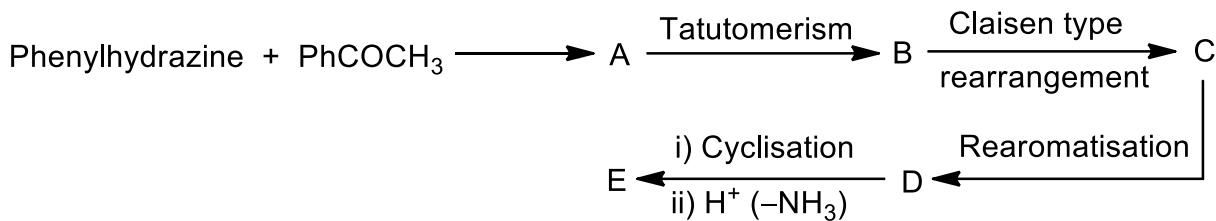


2. What is *Merrifield resin*? Show the steps in the synthesis of the dipeptide **Gly-Ala** in the solid phase with the help of the resin.
3. Mention the purine bases present in RNA. What happens when an electric current is passed through an aqueous solution buffered at pH 6 containing alanine (6), glutamic acid (3.2) and arginine (10.7)? The isoelectric points are given in parenthesis. Explain your answer indicating the structures of the predominant forms of those amino acids at pH 6.
4. Predict the fate of the following compound in the case of photochemical and thermal electrocyclic ring closure and explain the reactions on the basis of FMO theory:

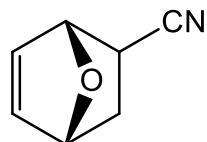


5. Designate the geometrical isomers of citral in *E/Z* system of nomenclature. Prove by chemical and spectroscopic methods that citral contains terminal isopropylidene group and an α , β -unsaturated aldehyde group.
6. D-Lyxose is formed by Ruff degradation of galactose. Give the structure of D-lyxose showing necessary reactions. Ruff degradation of D-lyxose gives D-threose. Give the structure of D-threose and show the reactions involved.

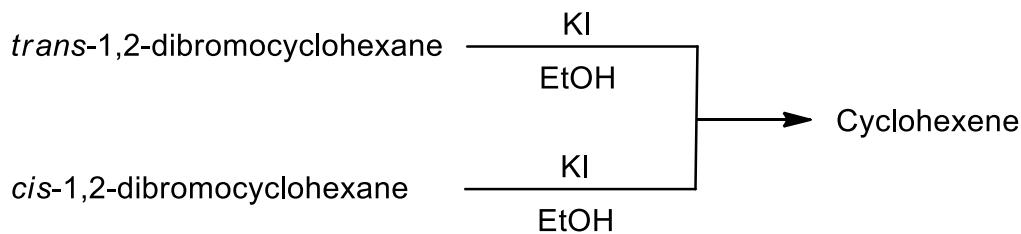
7. Identify **A** to **E** in the following reaction sequences:



8. Propose a synthesis of 8-hydroxyquinoline. What *diene* and *dienophile* would react to provide the following *Diels-Alder* adduct?



9. Draw the most stable conformation of *trans*-1,2-dimethylcyclohexane. Provide a mechanism for each of the following:



10. Using *Diels-Alder* reaction how can you prepare anthracene starting from 1,4-naphthaquinone? 9,10 positions of anthracene are much more active than other positions—Explain.
