

Roll No. : .....

Total No. of Questions : 11 ]

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# **BPG-1091**

**M.Sc. (Previous) Examination, 2021**

**CHEMISTRY**

Paper - II

CH-402

**(Organic Chemistry)**

*Time : 1½ Hours ]*

*[ Maximum Marks : 75*

**Section-A**

**(Marks : 2 × 10 = 20)**

**Note :-** Answer all *ten* questions (Answer limit **50** words). Each question carries **2** marks.

**Section-B**

**(Marks : 5 × 5 = 25)**

**Note :-** Answer all *five* questions. Each question has internal choice (Answer limit **200** words). Each question carries **5** marks.

**Section-C**

**(Marks : 10 × 3 = 30)**

**Note :-** Answer any *three* questions out of five (Answer limit **500** words). Each question carries **10** marks.

**Section-A**

2 each

1. (i) What is the difference between transition state and intermediate ?
- (ii) What is isotopic effect ?

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- (iii) What is Tautomerism ?
- (iv) What do you mean by 1, 3-dipolar cycloaddition reactions ?
- (v) Explain photoinduced cyclisation of  $4n$  system.
- (vi) What do you understand by symmetry in allyl and 2, 4-pentadienyl system ?
- (vii) What is anchimeric assistance ?
- (viii) What is ortho-para ratio ?
- (ix) Explain optical activity in biphenyls.
- (x) What are non-benzenoid aromatic compounds ?

**Section-B**

5 each

2. What are sigmatropic rearrangements ? Give their stereochemistry.

*Or*

Write a note on Fluxional Tautomerism.

3. What is asymmetric synthesis ? Explain with examples.

*Or*

With suitable examples, explain stereochemistry of compounds containing nitrogen.

4. What is structure of intermediate carbanion ? Explain the various factors affecting its stability.

*Or*

How is nmr spectroscopy helpful in detection of carbocations ?

5. Discuss the mechanism and stereochemistry of free radical bromination of (R) 1-bromo-2-methylbutane.

*Or*

Give the structures of all the free radical monochloro products of 1, 2-dibromopropane and indicate them as chiral or achiral.

6. Explain giving examples the difference between  $E_1$  and  $E_2$  mechanism.

*Or*

Write a note on aldol condensation.

**Section-C**

10 each

7. What do you mean by axial and equatorial hydrogen ? What is their role in stereochemistry and stability of disubstituted cyclohexanes ?
8. Write notes on the following :
- (a) Perkins Reaction
  - (b) Benzoin Condensation
9. What are singlet and triplet carbenes ? How are they formed ? Explain their structure and stability.
10. Explain mechanism of aromatic nucleophilic substitution reaction through benzyne formation. Give various evidences in favour of formation of benzyne.
11. State if Diels-Alder reaction for formation of cyclopentadienes leads to endo or exo product. Which of these is thermodynamically more stable ? Illustrate your answer with example.