



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program /Eighth Semester – 2019

Paper: Organic Chemistry (Sp. Theory-II)

Course Code: CHEM-429 Part – I (Compulsory)

Time: 15 Min. Marks: 10

Roll No. in Fig. ....

Roll No. in Words. ....

Signature of Supdt.: .....

**ATTEMPT THIS PAPER ON THIS QUESTION SHEET ONLY.**

**Division of marks is given in front of each question.**

**This Paper will be collected back after expiry of time limit mentioned above.**

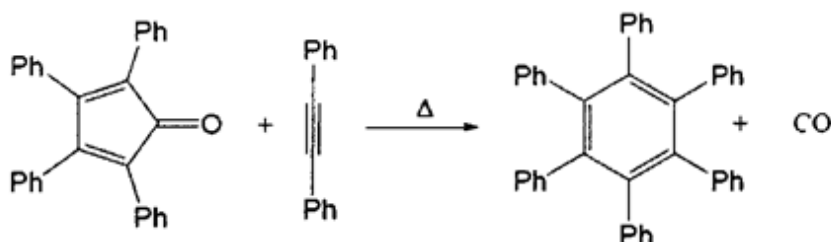
**Q.1. Encircle the correct option.**

**(10x1=10)**

1 Diels-Alder reaction belongs to

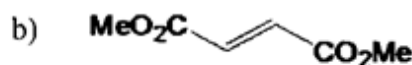
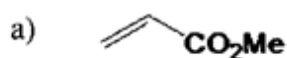
- a) Cycloadditions
- b) Sigmatropic reactions
- c) Group transfer reactions
- d) Electrocyclic reactions

2 The following involves two pericyclic reactions. Which combination indicates correctly the types of reaction involved?



- a) [4+2] cycloaddition + [2+2] cycloreversion
- b) cheletropic reaction + [4+2] cycloaddition
- c) [4+2] cycloaddition + [4+1] cycloreversion
- d) [4+2] cycloaddition + cheletropic reaction

3 Which of the following dienophiles is the most reactive with buta-1,3-diene for cycloaddition reaction?



4 Which is the most reactive as diene for Diels-Alder reaction?

- a) Furan
- b) Thiophene
- c) Pyrrole
- d) Benzene

P.T.O.

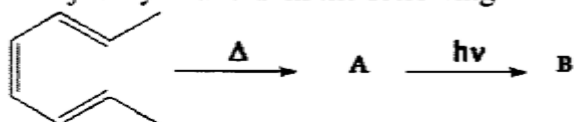
- 5 Which of the following statement is incorrect for pericyclic reactions?
- a) Pericyclic reactions are stereospecific.      b) Positively charged intermediates involved in pericyclic reactions.
- c) Pericyclic reactions are concerted reactions.      d) Group transfer reactions are pericyclic reactions.
- 6 An important way of making alkenes using phosphorous is
- a) Peterson reaction      b) Wurtz reaction
- c) Wittig reaction      d) Hoffmann reaction
- 7 Which of the following protecting groups is used for amines?
- a) Tetrahydropyranyl      b) *t*-Butyldimethylsilyl
- c) Acetal      d) Carbobenzyloxy
- 8 How many number of  $\pi$  Bonds in Benzyne?
- a) 3      b) 4
- c) 5      d) 6
- 9 Carbenes are
- a) Electron deficient species      b) Electron rich species
- c) Very unreactive      d) Negatively charged species
- 10 Umpolung means
- a) Reversal of polarity      b) Reversal of configuration
- c) Functional group interconversion      d) Chemoselectivity



**ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED**

**Short Answer Questions**

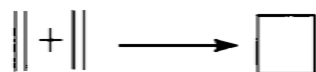
- Q.2
1. How thermal electrocyclization of a conjugated polyene with  $(4n+2)\pi$  electrons proceeds through disrotation? 02
  2. What are [3,3]-sigmatropic rearrangements. 02
  3. How would you differentiate between singlet nitrene and triplet nitrene? 02
  4. What are group transfer reactions? Give one example. 02
  5. Label and justify A and B in the following 02



6. Why acetylation of aniline is necessary during preparation of *para*-Nitroaniline from aniline? 02
7. Design the synthesis of benzyl chloroformate from simpler reagents. 02
8. What is difference between linear and convergent synthesis? 02
9. What is Chemoselectivity? Give an example. 02
10. Write one method for the protection and deprotection of alcohols in chemical reactions. 02

**Long Questions**

- Q.3 A. Which of the following reactions will proceed thermally and which will undergo photochemically? Explain your answer by using frontier molecular orbital (FMO) approach. 06



- B. Suggest the products of thermal and photochemical electrocyclization of the following compounds 04
- I. 2E,4E-Hexa-2,4-diene
  - II. 2E,4Z,6E-Octa-2,4,6-triene

- Q.4 A. Design synthesis for the following 06
- I. Paracetamol from Phenol
  - II. 2-Methylacetophenone from 2-Bromotoluene
  - III. Propanoic acid from acetic acid
- B. Describe the significance of Friedel Craft reactions in organic synthesis, by comparing FC alkylation and FC acylation processes. 04

- Q.5 A. What are the Nitrenes? How they are generated. 06
- B. Give five synthetic applications of carbenes. 04