

[178]

SEAT No. _____

No. of printed pages: 03

SARDAR PATEL UNIVERSITY

M.Sc. (Chemistry), Semester – III

March 27, 2019: Wednesday

Time: 02:00 P.M. – 05:00 P.M.

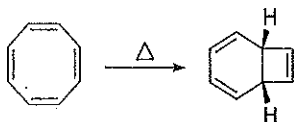
Selected Topics in Organic Chemistry [PS03EORC21]

Note: Figures to the right indicate full marks.

Total marks: 70

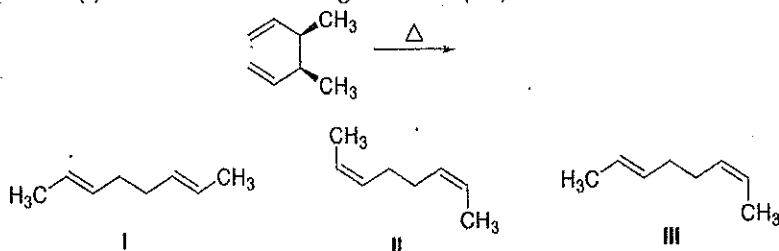
Q-1 Select the correct answer and mention only the code of correct answer against their question numbers. [08]

- a. The complimentary colour of blue is _____.
 (i) yellow (ii) purple (iii) red (iv) violet
- b. The absorption region for red colour is _____.
 (i) 500-560 nm (ii) 580-595 nm (iii) 605-750 nm (iv) 450-490 nm
- c. Which one of the following is an inorganic pigment?
 (i) Hansa Yellow G (ii) fast red (iii) malachite green (iv) charcoal
- d. Which of the following stilbene FBA contains a 1,2,3-triazole nucleus in it?
 (i) Tinopal BV (ii) Tinopal RBS (iii) Blankophor R (iv) None
- e. In the following concerted reaction, the product is formed by a _____ electrocyclization.



- (i) 6π -Electron disrotatory (iii) 6π -Electron conrotatory
 (ii) 4π -Electron disrotatory (iv) 4π -Electron conrotatory

f. The product(s) formed in the following reaction is(are) _____.

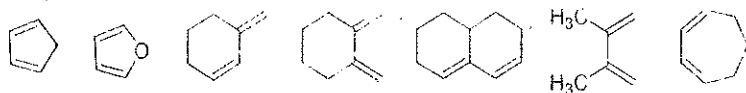


- (i) Mixture of I & II (ii) I only (iii) II only (iv) III only

(P.T.O)

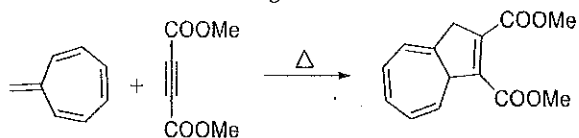
①

- g. The number of following diene(s) that does(not) undergo Diels-Alder reaction with methyl acrylate is



- (i) 1 (ii) 2 (iii) 3 (iv) 5

- h. Which system is involved in the following transformation?

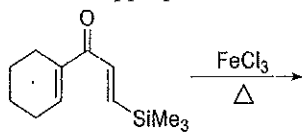


- (i) $\pi^4s + \pi^2a$ (ii) $\pi^4s + \pi^2s$ (iii) $\pi^8s + \pi^2s$ (iv) $\pi^8a + \pi^2s$

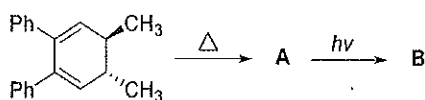
Q-2 Answer ANY SEVEN of the following in short.

[14]

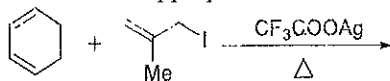
- Explain the food dyes in detail.
- Define bathochromic and hypsochromic shift.
- Describe metal complexes of pigments.
- List out the indicator dyes with their structures.
- Discuss the characteristic features of pericyclic reaction. Enlist different types of pericyclic reaction.
- Complete the following reaction with appropriate mechanism.



- g. Identify products A and B in the following reaction sequence. Label each process as *conrotatory* or *disrotatory*.



- h. Complete the following reaction with appropriate mechanism.



- i. Write a short note on stereochemistry of 1,3-dipolar cycloaddition reaction.

Q-3 [A] Write the synthesis of the following.

[06]

- (i) Safranin T (ii) Crystal violet (iii) Orange - I

Q-3 [B] Write the classification of dyes according to their mode of applications.

[06]

OR

Q-3 [B] Discuss Valance bond theory and Molecular orbital theory used to explain the structure of dyes.

[06]

Q-4 [A] What are the Fluorescent brightening agents? Write their characteristics and synthesis of any two FBAs. [06]

Q-4 [B] Give the difference between dye and pigment? Write the application of pigments. [06]

OR

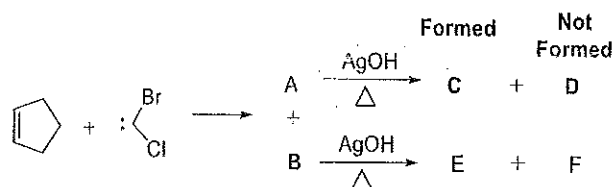
Q-4 [B] Explain colour photography in brief. [06]

Q-5 [A] Draw the molecular orbitals of 1, 3, 5-hexatriene along with present symmetry element (m or C_2) and show its HOMO and LUMO in thermal and photochemical condition. [06]

Q-5 [B] Explain the Woodward and Hoffmann theory for electrocyclic ring opening reaction of cyclobutene. [06]

OR

Q-5 [B] Complete the following reaction with appropriate mechanism and explain why the *trans*- products D and F do not formed. [06]



Q-6 [A] Construct and explain the correlation diagram of [2+2] cycloaddition reaction of ethene. [06]

Q-6 [B] Define 'Group transfer reaction'. Discuss 'ene reactions' and their types in detail. [06]

OR

Q-6 [B] 'The thermal cycloaddition of cyclopentadiene and tropone leads only *exo* adduct.' [06] Justify the statement in terms of HOMO-LUMO interactions.

