SEAT No._____

[54]

SARDAR PATEL UNIVERSITY
M.Sc.-III-SEMESTER Examination
M.Sc. Organic chemistry
PS03EORC21: Selected Topics in Organic Chemistry

Date: 05/01/2021, Tuesday
TIME: 10:00 AM-12:00 PM   TOTAL MARKS: 70

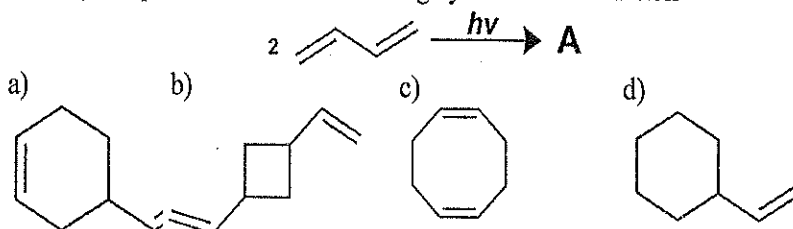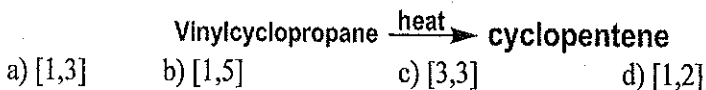**Q-1[A]**   [08]

1 Which one of the following statement is incorrect for Cope rearrangement?
   a) It is first order kinetics.   b) It is an intramolecular process
   c) It leads to formation of cross   d) It proceeds through a cyclic
      product   transition state

2 Identify the product A in the following cycloaddition reaction

3 Which of the following sigmatropic rearrangements is involved in given reaction?

   Vinylcyclopropane —heat→ cyclopentene
   a) [1,3]   b) [1,5]   c) [3,3]   d) [1,2]

4 Which one of the following statement is true for Diels-Alder reaction?
   a) Concerted and stereospecific   c) Concerted, but not stereospecific
      reaction   reaction
   b) Stereo selective   d) Non-concerted reaction

5 Which of the following is a dependent chromophore _____.
   a) -N=O   b) -c=o
   c) -NO2   d) -N=N-

6 Hair dyes must be tested for _____ acceptibility and related side effect.
   a) Colour   b) toxicological
   c) psychological   d) pharmacological

7 _____ from the following is an inorganic pigment.
   a) Fast red   b) Malachite Green
   c) Charcoal   d) Amido Yellow-1

8 ...... from the following is white inorganic pigment.
   a) titanium dioxide   b) tin oxide
   c) titanium dichloride   d) None of the above
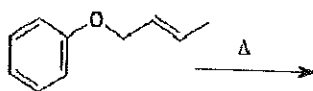
(1)   (P.T.O.)

Q-1 [B]   Answer the following.

[16]

1 How many nodes present in 6th -π molecular orbital of 1,3,5-hexatriene ?

2 Which sigmatropic shift involve in Benzidine rearrangements?

3 Which symmetry element present in HOMO of 1,3 butadiene in ground state?

4 Give HOMO of pentadienyl cation in ground state.

5 The major product formed when (3R,4S)-3,4-dimethylhexa-1,5-diene is heated at 240°C is ?

6 Cyclopentadiene reacts with acrylic ester to give products of Dielse-Alder reaction. What are the interacting frontier molecular orbitals?

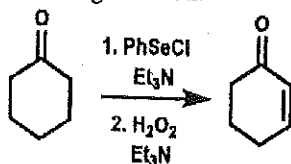7 Which of phenols is the main product of the following thermal rearrangement

8 Give the product formed in following reaction.

9 The complementory colour of yellow is violet. (T/F)

10 Bathochromic shift is also known as _____ .

11 fluorescent brightening agent must have a non-conjugated system. (T/F)

12 _____ dyes are used in LCD.

13 _____ is use as a catalyst in process of color photography.

14 Define Dye.

15 Disperse dye is used for the dying of polyester. (T/F)

16 Write the General structure of NIR Dye.

Q-2   Answer any SEVEN from the following.

[14]

1 Give the synthesis of DPP.

2 Michler's hydrol is colorless but its cation is blue, explain.

3 Write any two name of ink dye with structure.

4 Describe modern high grade pigment.

5 Write a structure of any two metal free pigment.

6 Define pericyclic reaction. Enlist different types of pericyclic reaction.

7 Give the mechanism of following reaction.

8 Explain "Cycloaddition of cyclopentadiene and tropone gives endo adduct as the major product"

9 Write general reaction of following with one example:
1) Cycloaddition with diazoalkanes
2) Cycloaddition with azomethine yields

(2)

Q-3 Write the characteristics of Diels-Alder reaction. Explain any four with example. [08]

OR

Q-3 Draw the molecular orbitals of 1,3,5-hexatrine along with present symmetry element (m or C_2) and show its HOMO and LUMO in thermal and photochemical condition. [08]

Q-4 Prove the following observation table for the electrocyclic ring closing reaction of 1,3 butadiene and (Z)-hexa-1,3,5-triene by help of FMO theory. [08]

Sytem	Δ	hv
4n	Conrotatory	Disrotatory
4n+2	Disrotatory	Conrotatory

OR

Q-4 Define 'group transfer reaction' Discuss 'ene reactions 'and their types in details. [08]

Q-5 Write synthesis of following: [08]
    i) methyl violet   ii) pyrazolone azo
    iii) Rhodomine B   iv) Malachite green

OR

Q-5 Write a Complete notes on Lather and Indigo dyes. [08]

Q-6 write definition, Characteristics Properties, classification and synthesis of Fluorescent Brightening Agents. [08]

OR

Q-6 write brief notes on azo pigments and lakes & metal complex pigments. [08]

(3)