

SARDAR PATEL UNIVERSITY
M. Sc. Semester – III (Organic Chemistry) Examination
Monday, 25th November 2019
Time: 02.00 p.m. to 05.00 p.m.
PS03EORC21: Selected Topics in Organic Chemistry

Total Marks: 70

Q . 1 Select the correct answer from the alternatives given below to the each question [08]

- [1] _____ is an example of leather dye.
[a] Erythrosine [b] Cyanine dyes
[c] Bismark brown [d] Methyl orange
- [2] Alkylation of amines produces _____ effect while alkylation of phenols produces _____ effect.
[a] Hypsochromic, Bathochromic [b] Bathochromic, Hypsochromic
[c] Hypsochromic, Hypsochromic [d] Bathochromic, Bathochromic
- [3] Which of the following is used as **cyan coupler** in color photography?
[a] 1-Aryl-5-pyrazolone derivatives [b] β -ketocarboxamide derivatives
[c] Phenol and naphthol containing indoaniline dyes [d] Phenylenediamine derivatives
- [4] Base component used for the synthesis of Hansa Yellow G pigment is _____.
[a] 2-Methyl-4-nitroaniline [b] 3-Methyl-2-nitroaniline
[c] 4-Methyl-3-nitroaniline [d] 4-Methyl-2-nitroaniline
- [5] Photochemical LUMO for 2,4-pentadienyl free radical is _____.
[a] ψ_1 [b] ψ_2
[c] ψ_3 [d] ψ_4
- [6] Correlation diagram method is also known as _____.
[a] Woodward-Hoffmann approach [b] Fukii's approach
[c] Huckel-Mobius approach [d] None
- [7] Cope elimination is an example of _____.
[a] 1,3-diolar cycloaddition [b] [2, 3]-sigmatropic rearrangement
[c] [3, 3]-sigmatropic rearrangement [d] syn- β -elimination
- [8] Dichloroketenes undergo [2+2] cycloaddition reaction in _____ manner.
[a] Supra-Supra [b] Antara-Antara
[c] Supra-Antara [d] None

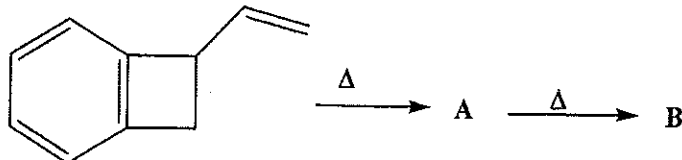
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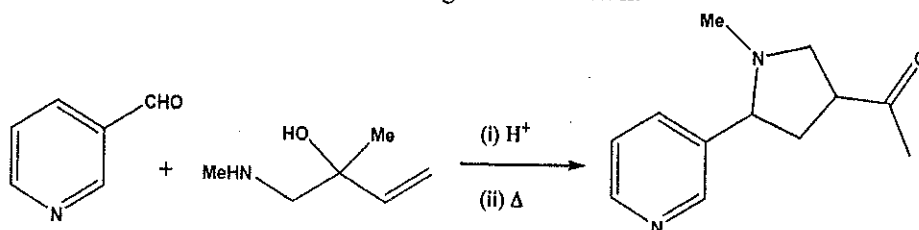
Q. 2 Answer the following questions (ANY SEVEN)

[14]

- [1] Discuss about direct dyes.
- [2] Explain with example(s): "color is an additive property".
- [3] Write about different types of chromophores.
- [4] Enlist the uses of Fluorescent Brightening Agents (FBAs).
- [5] What are toner pigments and lakes?
- [6] Apply Huckel-Mobius approach for predicting the feasibility of [4+2] cycloaddition reactions.
- [7] Discuss [2+2] cycloaddition reactions.
- [8] Predict the products A and B.



- [9] Give the mechanism for the following transformation.



Q. 3

- [a] Give synthesis of following dyes.

[06]

- (i) Methyl orange
- (ii) Tartrazine
- (iii) Alizarin

- [b] Answer the following questions.

- [1] Write note on leather dyes. [03]
- [2] Explain following on the basis of Valence Bond Theory (VBT): [03]
 - (i) Benzene is colorless, nitrobenzene is pale yellow while p-nitroaniline is dark yellow in color.
 - (ii) p-Amino azobenzene have yellow color in neutral/basic medium while violet color in acidic medium.

OR

- [b] Answer the following questions.

- [1] Give chemical classification of dyes. Discuss triphenylmethane dyes. [03]
- [2] Write note on hair dyes. [03]

2

Q. 4

[a] Answer the following questions.

- [1] Give differences between dyes and pigments. [03]
 [2] Give synthesis of following Fluorescent Brightening Agents (FBAs): [03]
 (i) Bankophor R (ii) Tinopal BV

[b] Answer the following questions.

- [1] Why there was a need to develop modern high grade pigments? Discuss in detail phthalocyanine pigments. [03]
 [2] Discuss characteristics of a good FBA. [03]

OR

[b] Write note on color and constitution relationship in acetoacetanilide pigments. [06]

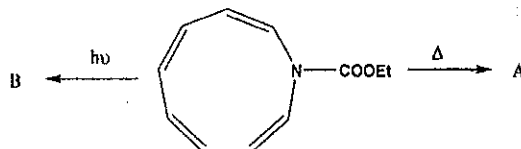
Q. 5

[a] Answer the following questions.

- [1] Discuss about following: [03]
 (i) Sommelet-Hauser rearrangement (ii) Mislow-Evans rearrangement
 [2] "Electrocyclic ring closure/ring opening of 1,3,5-hexatriene is thermally allowed under disrotatory mode while it is photochemically allowed under conrotatory mode". Explain using FMO method. [03]

[b] Answer the following questions.

- [1] Ethyl *1H*-azonine-1-carboxylate (I) gives different products under thermal and photochemical conditions. Predict products A and B. Explain mechanism for their formation. [03]



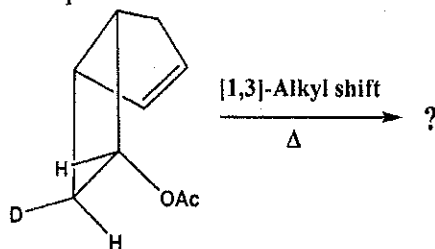
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- [2] Draw and discuss molecular orbital diagram for 1,3-butadiene. [03]

OR

[b] Answer the following questions.

- [1] Write note on Nazarov reaction. [03]
 [2] Predict the product. Explain its formation. [03]



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Q. 6

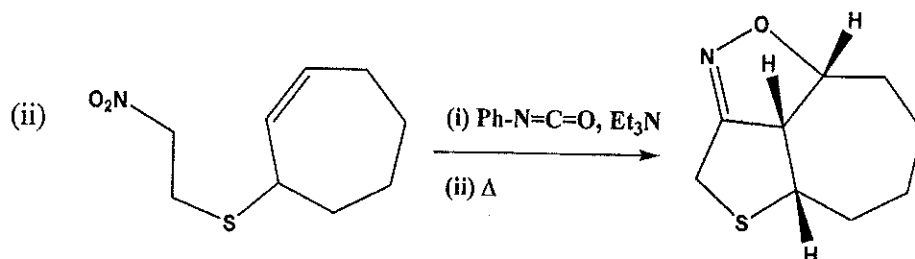
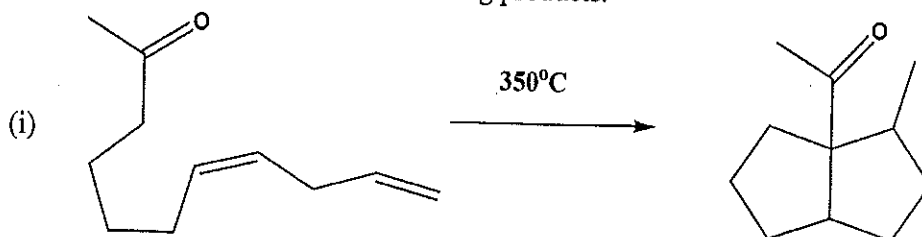
[a] Answer the following questions.

[1] Explain "Diels-Alder reaction is a stereospecific reaction".

[03]

[2] Explain the formation of following products.

[03]



[b] Answer the following questions.

[1] What is Endo rule? Discuss it in detail with example.

[03]

[2] Write note on *syn*- β -elimination.

[03]

OR

[b] Draw orbital correlation diagram for [2+2]-cycloaddition reaction between two ethylene. Predict the feasibility of reaction under thermal and photochemical condition based on it. [06]

— X —
(4)