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SARDAR PATEL UNIVERSITY
M. Sc. Semester – III (Organic Chemistry) Examination
Tuesday, 30th October 2018
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] Methyl orange is a (an) _____ dye.
[a] Hair [b] Photographic
[c] Indicator [d] NIR
- [2] Which of the following is a **dependent** chromophore?
[a] $-N=O$ [b] $>C=O$
[c] $-NO_2$ [d] $-N=N-$
- [3] Which of the following is used as **magenta coupler** in color photography?
[a] Phenol and naphthol containing indoaniline dyes [b] Phenylenediamine derivatives
[c] β -ketocarboxamide derivatives [d] 1-Aryl-5-pyrazolone derivatives
- [4] Which of the following is NOT an **organic pigment**?
[a] Indigo [b] Prussian blue
[c] Para red [d] Hansa Yellow G
- [5] Photochemical LUMO for 1,3-butadiene is
[a] ψ_1 [b] ψ_2
[c] ψ_3 [d] ψ_4
- [6] PMO approach is also known as
[a] Fukii's approach [b] Huckel-Mobius approach
[c] Woodward-Hoffmann approach [d] None
- [7] Chugaev reaction is an example of
[a] syn- β -elimination [b] [4+2]-cycloaddition
[c] [2+2]-cycloaddition [d] 1,3-diolar cycloaddition
- [8] Which of the following is (are) **CORRECT** for Ene reaction?
[a] It is a photochemical reaction [b] It usually requires higher temperature than Diels-Alder reaction.
[c] It is a group transfer reaction [d] Both b & c

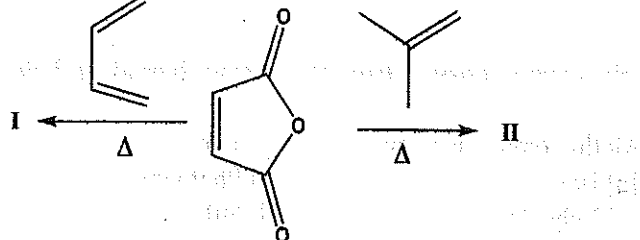
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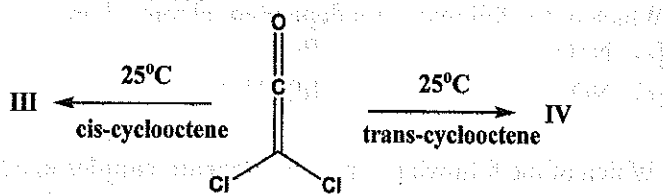
Q.2 Answer the following questions (ANY SEVEN)

[14]

- [1] Discuss quinonoid theory.
- [2] Explain "Malachite green has deeper color than Crystal violet".
- [3] Explain "Azobenzene is a colored compound but not a dye".
- [4] Give differences between inorganic and organic pigments.
- [5] Discuss lakes of acid.
- [6] Define: (i) Electrocyclic reactions, (ii) Cycloaddition reactions.
- [7] Discuss [5,5]-sigmatropic rearrangements.
- [8] Predict the products I and II.



- [9] Predict the products III and IV.



Q.3

- [a] Give synthesis of following dyes.

[06]

- (i) Malachite green
- (ii) Bismark brown
- (iii) Picric acid

- [b] Answer the following questions.

- [1] Write note on indicator dyes.
- [2] Discuss: (i) Acid dyes (ii) Basic dyes.

[03]

[03]

OR

- [b] Answer the following questions.

- [1] Give chemical classification of dyes. Discuss xanthene dyes.
- [2] Write note on photographic dyes.

[03]

[03]

Q.4

- [a] Answer the following questions.

- [1] Enlist the requirements of organic pigments.
- [2] Give synthesis of following Fluorescent Brightening Agents (FBAs):
 - (i) Tinopal RBS
 - (ii) Bankophor R

[03]

[03]

[b] Answer the following questions.

[1] Enlist various classes of heterocyclic pigments. Discuss (i) Thioindigo pigments, (ii) Perylene and Perinone pigments. [03]

[2] Give definition, uses and classification of FBAs. [03]

OR

[b] Write note on evaluation of pigments. [06]

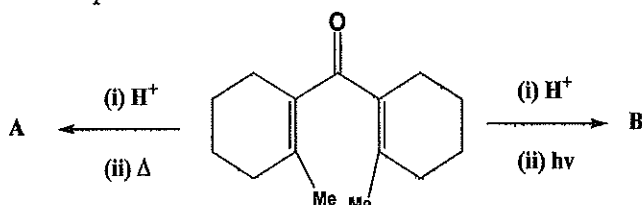
Q. 5 [a] Answer the following questions.

[1] Write note on [3,3]-sigmatropic rearrangements. [03]

[2] "Electrocyclic ring closure of 1,3-butadiene is thermally allowed under conrotatory mode while it is photochemically allowed under disrotatory mode". Explain using FMO method. [03]

[b] Answer the following questions.

[1] Predict products A and B. Give mechanism for it. [03]



[2] Draw and discuss molecular orbital diagram for 1,3,5-hexatriene. [03]

OR

[b] Answer the following questions.

[1] Write note on [2,3]-sigmatropic rearrangements. [03]

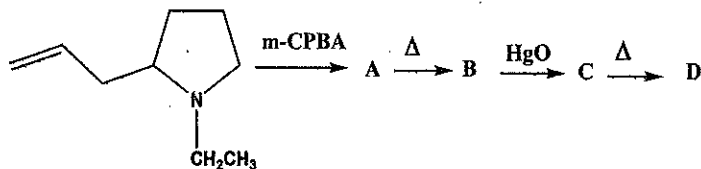
[2] Explain "endo-7-chlorobicyclo[4.1.0]heptane undergoes solvolysis readily at 125°C but exo-7-chlorobicyclo[4.1.0]heptane is recovered unchanged after prolonged heating in acetic acid". [03]

Q. 6

[a] Answer the following questions.

[1] Explain "Diels-Alder reaction is a regioselective reaction". [03]

[2] Predict the structures of A to D. [03]



[b] Answer the following questions.

[1] Write note on "Intramolecular Diels-Alder reaction". [03]

[2] Discuss synthetic utility of diimide in organic chemistry. [03]

OR

[b] Draw orbital correlation diagram for [4+2]-cycloaddition reaction of 1,3-butadiene and ethylene. Predict the feasibility of reaction under thermal and photochemical condition based on it. [06]

— X —

(3)

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 1720) ...

1730) ...
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1760) ...
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1790) ...
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1850) ...
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