

2016

(6th Semester)

CHEMISTRY

NINTH PAPER

Course No. : CHEM-361

(Organic Chemistry—III)

Full Marks : 55

Time : 2½ hours

(PART : B—DESCRIPTIVE)

(Marks : 35)

*The figures in the margin indicate full marks
for the questions*

1. (a) Explain Franck-Condon principle. 3
 (b) Explain the following : 4
 (i) Fluorescence
 (ii) Phosphorescence

OR

2. (a) Discuss Jablonski diagram. 3
 (b) Discuss the following with example : 2+2=4
 (i) Photoreduction
 (ii) Norrish type-I reaction
3. (a) Discuss the process of conrotatory ring closure for 1,6-disubstituted 1,3,5-hexatriene using FMO method. 3
 (b) With the help of FMO, show that $[\pi_s^4 + \pi_s^2]$ cycloaddition reaction is thermally allowed process. 3
 (c) What are dienophiles? 1

OR

4. (a) Discuss Woodward-Hofmann rule for electrocyclic reaction. 3
 (b) Discuss the suprafacial and antarafacial mode of cycloaddition in pericyclic reaction using suitable example. 4
5. (a) Discuss with chemical reaction, the synthesis of—
 (i) thioether;
 (ii) sulphaguanidine. 4

(3)

- (b) Discuss the 1,3-diaxial interaction in the case of—
- (i) 1,3-dimethylcyclohexane;
- (ii) 1,5-dimethylcyclohexane. 3

OR

6. (a) Complete the following reactions : 3
- (i) Sulphonic acid + Br₂ / Fe →
- (ii) Sulphonic acid + HNO₃ + H₂SO₄ →
- (iii) Sulphonic acid + H₂SO₄ (oleum) →
- (b) Write all the possible isomers of 1,3-dimethylcyclohexane. 3
- (c) Write one formation of thiol. 1
7. (a) Discuss with mechanism the reaction of—
- (i) aldol condensation reaction;
- (ii) Wittig reaction. 4
- (b) Discuss the process of biochemical oxidation in organic synthesis. 3

OR

8. (a) Discuss the preparation of 2-chloro-N-aryl anthranilic acid from Green preparation process. 3

(4)

- (b) Explain with mechanism Michael addition. 4

9. (a) Discuss the following in brief : 3
- (i) Base peak in mass spectroscopy
- (ii) Molecular ion peak
- (iii) Metastable ion
- (b) What do you understand by shielding and deshielding of protons in NMR? 2
- (c) Define chemical shift. 2

OR

10. (a) Discuss the fragmentation pattern of 3,3-dimethylheptane. 3
- (b) Predict the chemical shift for ethyl acetate and 1,1,2-tribromoethane. 2
- (c) What do you understand by coupling constant? 2

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Subject Code : CHEM/VI/09

Booklet No. **A**

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DEGREE 6th Semester
(Arts / Science / Commerce /
.....) Exam., **2016**
Subject
Paper

To be filled in by the Candidate
DEGREE 6th Semester
(Arts / Science / Commerce /
.....) Exam., **2016**
Roll No.
Regn. No.
Subject
Paper
Descriptive Type
Booklet No. B

INSTRUCTIONS TO CANDIDATES

- 1. The Booklet No. of this script should be quoted in the answer script meant for descriptive type questions and vice versa.
- 2. This paper should be ANSWERED FIRST and submitted within 45 minutes of the commencement of the Examination.
- 3. While answering the questions of this booklet, any cutting, erasing, overwriting or furnishing more than one answer is prohibited. Any rough work, if required, should be done only on the main Answer Book. Instructions given in each question should be followed for answering that question only.

Signature of
Scrutiniser(s)

Signature of
Examiner(s)

Signature of
Invigilator(s)

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(6th Semester)

CHEMISTRY

NINTH PAPER

Course No. : CHEM-361

(Organic Chemistry—III)

(PART : A—OBJECTIVE)

(Marks : 20)

The figures in the margin indicate full marks for the questions

SECTION—A

(Marks : 5)

Put a Tick (✓) mark against the correct answer in the brackets provided for it : 1×5=5

1. Photosensitization is the process where

- (a) the photoexcited molecule expends its energy in exciting another molecule ()
- (b) the photoexcited molecule absorbs extra energy from another molecule ()
- (c) the photoexcited molecule decomposes ()
- (d) None of the above ()

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(2)

2. Dienes have

- (a) two π -electrons ()
- (b) four π -electrons ()
- (c) four π -bonds ()
- (d) two single bonds ()

3. In disubstituted cyclohexane, most stable orientation is

- (a) the substituents are in axial position ()
- (b) the substituents are in equatorial position ()
- (c) the substituents are in axial and equatorial position ()
- (d) All of the above ()

4. Mannich reaction is an example of

- (a) microwave assisted reaction ()
- (b) UV-assisted reaction ()
- (c) IR-assisted reaction ()
- (d) None of the above ()

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(3)

5. In NMR, we use

(a) tetramethylsilane (TMS) as reference ()

(b) ^{13}C as reference ()

(c) ^1H as reference ()

(d) methanol as reference ()

(4)

SECTION—B

(Marks : 15)

Answer the following questions :

3×5=15

1. Explain Norrish type-II cleavage.

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(5)

2. Define pericyclic reaction with suitable example.

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(6)

3. Explain the advantage of organolithium in hindered carbonyl groups. Give one example.

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(7)

4. Explain with example, the process of Diels-Alder reaction with mechanism.

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(8)

5. Discuss the basic principle of mass spectroscopy.

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