

2017

( 6th Semester )

CHEMISTRY

NINTH PAPER

(CHEM-361)

( Organic Chemistry—III )

Full Marks : 55

Time : 2½ hours

( PART : B—DESCRIPTIVE )

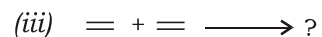
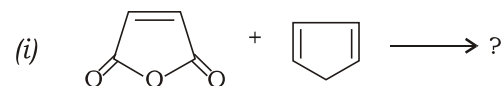
( Marks : 35 )

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

1. (a) Draw Jablonski diagram of a molecule and explain it. 4
- (b) Discuss the following with example : 3
- (i) Photoreduction reaction
- (ii) Norrish type-II cleavage

OR

- (a) What types of excitations are possible in benzophenone molecule on irradiation with UV light? 4
- (b) Comment upon—
- (i) spin forbidden transitions ;
- (ii) quenching process in photochemistry. 3
2. (a) Why is disrotatory ring closure allowed in a photoinduced reaction of 1,4-disubstituted 1,3-butadiene? Explain it with the help of FMO (Frontier Molecular Orbital) method. 4
- (b) Complete the following reactions naming the type of cycloaddition reaction : 3

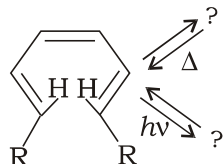


Or

- (a) Write short notes on suprafacial and antarafacial processes in cycloaddition reactions. 4

( 3 )

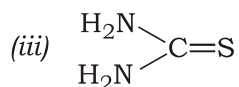
- (b) Predict the products from the following reaction : 3



3. (a) Define the term 'conformation'. Why is diequatorial chair conformer of disubstituted cyclohexane more stable than diaxial conformer? Explain. 4
- (b) What happens when diethyl sulphide is oxidised with potassium permanganate? Write the chemical equation. 3

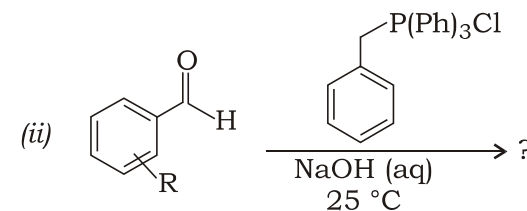
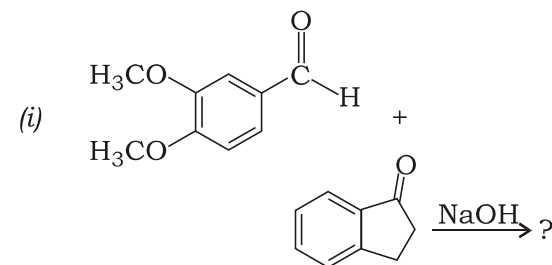
Or

- (a) Write all the possible conformers of 1,4-disubstituted cyclohexane. Which conformer is the least stable one? 4
- (b) How will you prepare thiol from the following compounds? 1×3=3



( 4 )

4. (a) Discuss the microwave assisted Hofmann elimination reaction. 3
- (b) Predict the products from the following reactions : 2+2=4

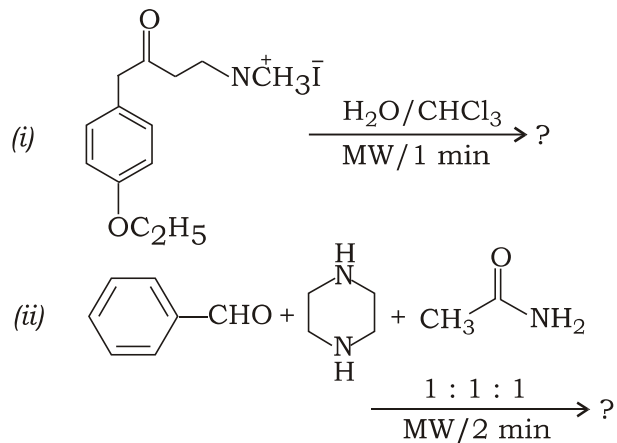


Or

- (a) Write the principle and chemical equation involved in the preparation of butyraldehyde by sonication method. 3

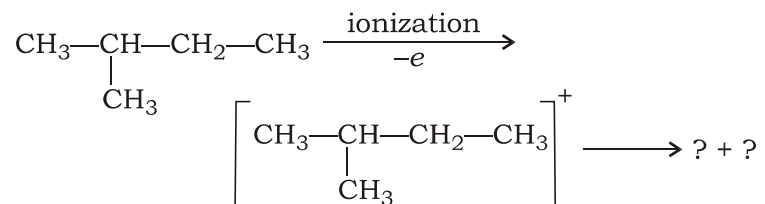
( 5 )

(b) Complete the following reactions : 2+2=4



5. (a) What do you understand by the terms 'shielding' and 'deshielding' of protons in the NMR spectroscopy? 3

(b) Propose the structures and fragmentation mechanisms corresponding to ions with  $m/z$  43 and 57 in the mass spectrum of isopentane molecule : 4



( 6 )

Or

(a) Explain the following terms :  $1\frac{1}{2} \times 2 = 3$

(i) Metastable ion

(ii) Molecular ion-peak

(b) Write the possible fragmentation and related  $m/z$  value of different fragments of methyl alcohol in mass spectrometry. 4

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**Subject Code : CHEM/VI/09**

**Booklet No. A**

Date Stamp .....

.....

**To be filled in by the Candidate**

DEGREE 6th Semester  
(Arts / Science / Commerce /  
..... ) Exam., **2017**

Subject .....

Paper .....

**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, over-writing 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.**

**To be filled in by the Candidate**

DEGREE 6th Semester  
(Arts / Science / Commerce /  
..... ) Exam., **2017**

Roll No. ....

Regn. No. ....

Subject .....

Paper .....

Descriptive Type

Booklet No. B .....

*Signature of  
Scrutiniser(s)*

*Signature of  
Examiner(s)*

*Signature of  
Invigilator(s)*

**/420**

**CHEM/VI/09**

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( 6th Semester )

**CHEMISTRY**

NINTH PAPER

(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 : 1×5=5

**1.** Fluorescence is a relaxation from

- (a) singlet to a triplet state (    )
- (b) triplet to a singlet state (    )
- (c) singlet to a singlet state (    )
- (d) None of the above (    )

**/420**

( 2 )

2. The organometallic compound which reacts with diisopropyl ketone to give bulky tertiary alcohol containing triisopropyl group is

(a)  $(\text{CH}_3)_2\text{CH} - \text{MgX}$  ( )

(b)  $(\text{CH}_3)_2\text{CHLi}$  ( )

(c)  $[(\text{CH}_3)_2\text{CH}]_2\text{Zn}$  ( )

(d)  $\text{R}_2\text{CuLi}$  ( )

3. The number of signals in NMR spectrum tell

(a) the number of different sets of equivalent protons in a molecule ( )

(b) the number of different sets of non-equivalent protons in the molecule ( )

(c) the number of different functional groups present in the molecule ( )

(d) None of the above ( )

4. The aim of green chemistry is

(a) to design the chemical products and processes that work most efficiently ( )

(b) to design the chemical products and processes that reduce hazardous substances ( )

(c) to design the chemical products and processes that maximize profit ( )

(d) None of the above ( )

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( 3 )

5. Cycloaddition reactions involve the formation of a cyclic compound from

- (a) a diene and a dienophile ( )
- (b) an alkane and an alkene ( )
- (c) a cyclic alkane and an alkene ( )
- (d) None of the above ( )

( 4 )

SECTION—B

( Marks : 15 )

Answer the following questions :

3×5=15

1. What do you understand by a pericyclic reaction?  
Explain it by taking an example of Diels-Alder reaction.

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( 5 )

2. How will you distinguish between  $\text{CH}_3 - \text{CH}_2 - \text{Br}$  and  $\text{CH}_3 - \text{CH}_2 - \text{OH}$  using  $^1\text{H}$ -NMR spectroscopy?

( 6 )

3. Write three reactions of thiol.

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( 7 )

4. What is a photosensitizer? Explain its role in a photochemical reaction.

( 8 )

5. Write three important principles of green chemistry.

★ ★ ★