

VI/ CHEM (ix)

2 0 1 4

(6th Semester)

CHEMISTRY

NINTH PAPER

Course No. : CHEM-361

(Organic Chemistry—III)

Full Marks : 55

Time : 2 hours

(PART : B—DESCRIPTIVE)

(Marks : 35)

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

1. (a) What is Franck-Condon principle? 3

**(b) Write brief notes on fluorescence and
phosphorescence. 2+2=4**

OR

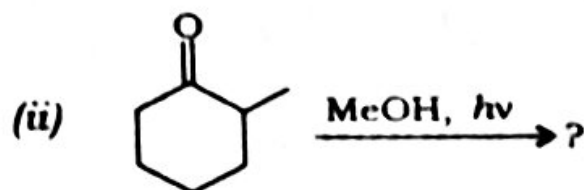
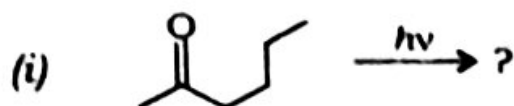
2. (a) What is Paterno-Buchi reaction? 3

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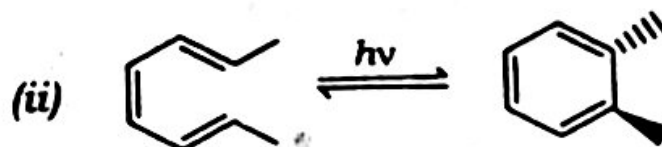
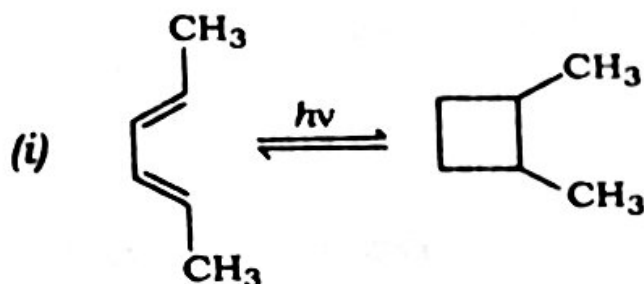
(Turn Over)

(2)

(b) Complete the following with suitable mechanism : 2+2=4



3. (a) Discuss the following reactions with suitable mechanism : 2+2=4

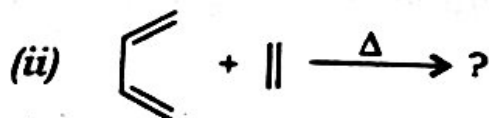
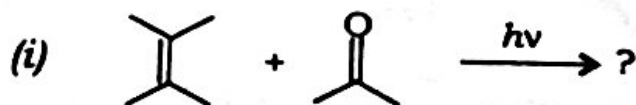


(b) What is frontier molecular orbital theory? 3

OR

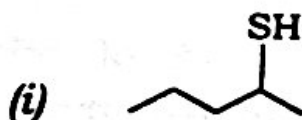
4. (a) What is Woodward-Hoffmann rule? 3

- (b) Discuss the following reactions with suitable mechanism : 2+2=4



5. (a) How to synthesize sulphonamide and sulphaguanidine? Discuss with reaction mechanism. 2+2=4

- (b) What is IUPAC name of the following? 3



OR

6. (a) Discuss the conformation of 1,4-disubstituted cyclohexanes. 3

- (b) Discuss the structural feature of the following : 2+2=4

(i) Sulphonic acid

(ii) Thioethers

7. (a) How can you synthesize butyraldehyde by sonication reaction? 2½

- (b) Explain the synthesis of alcohol by microbial method using biocatalyst. 2½

(c) What is green chemistry?

2

OR

8. (a) What is Wittig reaction? Discuss with suitable example as a green reaction with mechanism.

4

(b) How can Hoffmann elimination be performed as a green reaction? Explain with one example.

3

9. (a) Define metastable ion.

2

(b) Explain the mass spectra of ethanol (C_2H_5OH) and calculate the molecular ion peak of CH_3CHO .

3

(c) What is the basic principle of mass spectroscopy?

2

OR

10. (a) What is chemical shift?

2

(b) Discuss the NMR spectra of acetaldehyde and ethyl bromide.

$2\frac{1}{2} + 2\frac{1}{2} = 5$

2014

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(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. Electrocyclic reaction is

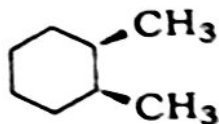
- (a) unimolecular ()
- (b) bimolecular ()
- (c) Both (a) and (b) ()
- (d) None of the above ()

(2)

2. Phosphorescence is a relaxation from

- (a) singlet to triplet ()
- (b) triplet to singlet ()
- (c) singlet to singlet ()
- (d) quartet to triplet ()

3. What is the conformation of the following compound?



- (a) *cis* ()
- (b) *trans* ()
- (c) *E* ()
- (d) *Z* ()

4. Reactant of aldol condensation is

- (a) alcohol ()
- (b) acid ()
- (c) alkane ()
- (d) aldehyde ()

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5. Molecular ion peak in mass spectroscopy is

- (a) molecular weight ()
- (b) molecular weight -1 ()
- (c) molecular weight + 1 ()
- (d) molecular weight + 2 ()

(4)

SECTION—B

(Marks : 15)

Answer the following questions : $3 \times 5 = 15$

1. Draw Jablonski diagram and explain it.

(5)

2. What are diene and dienophile and how are they taking part in pericyclic reactions?

(6)

3. Discuss the three reactions of thiols.

(7)

4. Discuss the proton NMR spectra of ethanol.

(8)

5. What is biocatalyst? Give one example of organic synthesis using biocatalyst.

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