

**VI/CHEM (xii) (B)**

**2015**

**( 6th Semester )**

**CHEMISTRY**

**TWELFTH (B) PAPER**

**Course No. : CHEM-364**

**( Natural Products )**

*Full Marks : 75*

*Time : 3 hours*

**( PART : B—DESCRIPTIVE )**

*( Marks : 50 )*

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

1. (a) What is isoprene rule? Elucidate the structure of menthol. 3
- (b) Write the structure of atropine and comment on it. 3
- (c) What are alkaloids? Give the names and structures of any two alkaloids. 4

OR

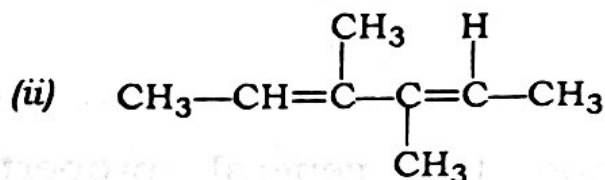
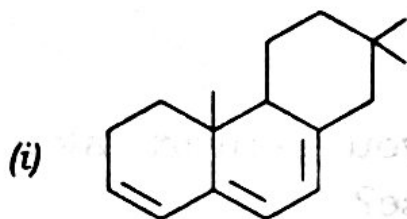
2. (a) What are terpenes? Give their classification with examples. 4
- (b) Write the name and structure of one indole alkaloid. 2
- (c) Write short notes on (i) camphor and (ii) pinene. 2+2=4

3. (a) Sketch the  $^1\text{H}$ -NMR signals of the following :  $1\frac{1}{2} + 1\frac{1}{2} = 3$
- (i) Ethanol
- (ii) Toluene
- (b) Using IR spectroscopy, how will you distinguish between ketone and alcohol? 3
- (c) Explain any *two* of the following terms :  $2 \times 2 = 4$
- (i) Bathochromic shift
- (ii) Chemical shift
- (iii) Equivalent and non-equivalent protons

OR

4. (a) Calculate  $\lambda_{\max}$  for the following compounds using Woodward rule :

$$1\frac{1}{2} + 1\frac{1}{2} = 3$$

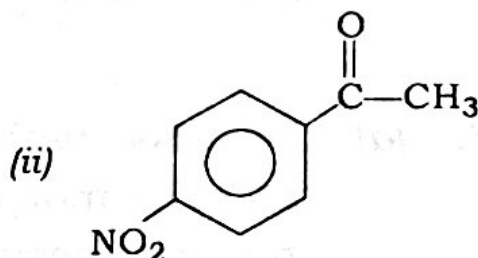
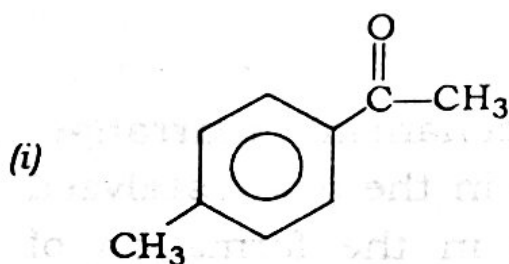


- (b) When 2-methyl butane is bombarded with high-energy electron, it gets defragmented and gives  $m/z$  values at 71, 57 and 43. Determine the fragmented structure.

4

- (c) Which of the following compounds shows lower  $\text{C}=\text{O}$  stretching frequency and why?

3



5. (a) Give a suitable method for the synthesis of a tripeptide starting from  $\alpha$ -amino acid by protecting amino group.

3

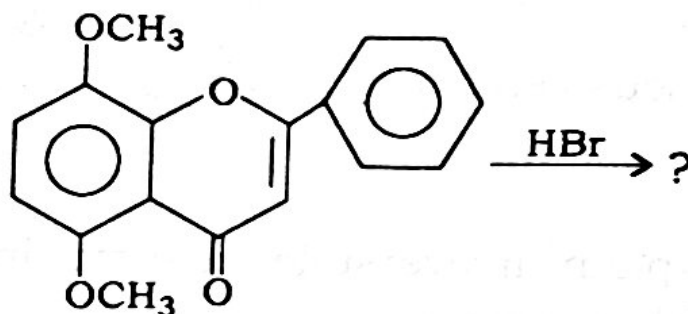
- (b) How does glucose react with  
(i) hydroxylamine ( $\text{NH}_2\text{OH}$ ) and (ii) HCN? 2
- (c) Write a short note on isoelectric point  
on amino acids. 3
- (d) How would you convert aldopentose  
into aldohexose? 2

OR

6. (a) Describe the general properties of  
proteins. 3
- (b) Draw the Haworth projection formula of  
 $\alpha$ -D-glucose and  $\beta$ -D-fructose. 3
- (c) Define peptide bond. Give suitable  
example. 2
- (d) How will you convert D-glucose into  
D-mannose? 2
7. (a) Discuss with mechanism rearrange-  
ment of morphine in the acid catalyzed  
reaction resulting in the formation of  
apomorphine. 4
- (b) Write a note on essential function of  
pheromones. 4

(c) Complete the following reaction :

2



OR

8. (a) Discuss briefly the chemical defences in insects with suitable examples.

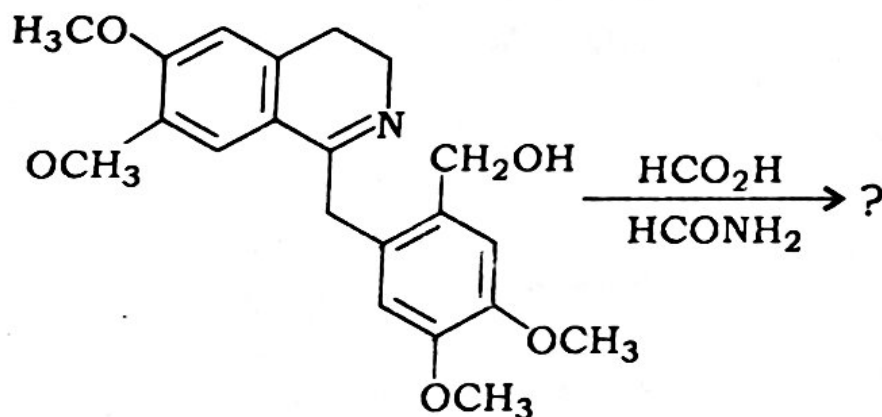
4

(b) What is Nametkin rearrangement?

4

(c) Write the following product :

2



9. (a) Write the characteristic functions of enzyme.

3

(b) Explain reversible enzyme inhibition.

5

(c) Write a short note on mode of action of enzyme.

2

OR

10. (a) Discuss enzyme specificity with suitable example. 5
- (b) Explain irreversible enzyme inhibition with example. 3
- (c) Discuss briefly the concerted model for allosteric interaction. 2

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**2015**

**( 6th Semester )**

**CHEMISTRY**

**TWELFTH (B) PAPER**

**Course No. : Chem-364**

**( Natural Products )**

**( PART : A—OBJECTIVE )**

**( Marks : 25 )**

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

**SECTION—A**

**( Marks : 10 )**

Put a Tick (✓) mark against the correct answer in the brackets provided for it : 1×10=10

**1. Volatile organic compounds which are odoriferous constituents of essential oils in plants are**

(a) alkaloids ( )

(b) terpenes ( )

(c) flavones ( )

(d) None of the above ( )

2. Hofmann degradation is applicable in

- (a) flavones ( )
- (b) terpenes ( )
- (c) alkaloids ( )
- (d) All of the above ( )

3. The full form of TMS is

- (a) tetramethyl silane ( )
- (b) trimethyl silane ( )
- (c) tertiary methyl silane ( )
- (d) None of the above ( )

4.  $\pi$ - $\pi^*$  transition is found in

- (a) alkanes ( )
- (b) alkenes ( )
- (c) alcohols ( )
- (d) None of the above ( )



5. Aspartic acid is

- (a) basic amino acid ( )
- (b) neutral amino acid ( )
- (c) acidic amino acid ( )
- (d) None of the above ( )

6. Epimers are diastereomers which differ only in

- (a) their functional group ( )
- (b) chemical reactivity ( )
- (c) ring structure ( )
- (d) stereochemistry at C-2 ( )

7. Chemical substances which are released by insects with specific, well defined physiological activities are called

- (a) hormones ( )
- (b) enzymes ( )
- (c) pheromones ( )
- (d) None of the above ( )

8. A molecule 'drawing in its limbs' in a yogic picture is seen in reactions of

- (a) morphine ( )
- (b) papaverine ( )
- (c) flavone ( )
- (d) camphor ( )

9. Enzyme acting on protein is

- (a) maltose ( )
- (b) lactose ( )
- (c) urease ( )
- (d) pepsin ( )

10. Allosteric enzymes are

- (a) oligomeric enzymes ( )
- (b) monomeric enzymes ( )
- (c) isozymes ( )
- (d) heteroenzymes ( )

( B )

**SECTION---B**

( Marks : 15 )

Answer the following questions :

3×5=15

1. Write in brief about nicotine.

2. How will you determine the presence of ketone by chemical method? Show with chemical reaction.

( 7 )

3. How will you synthesize alanine using Gabriel synthesis?

( 8 )

4. Discuss in brief plant-insect interaction

8. Give one example of hydrolytic enzyme assisted synthesis.

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