

## THIRD SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2010

(CCSS)

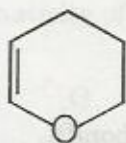
Chemistry--Complementary Course

CH 3C 05—ORGANIC AND BIOCHEMISTRY

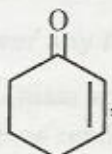
Time : Three Hours

Maximum Weight : 30

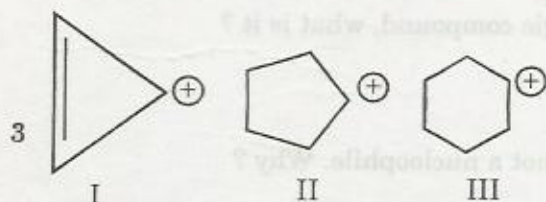
I. Multiple choice and fill in the blanks type questions. Answer all *twelve* questions :

1 In the molecule, , there are two C-O bond which of the following statement is true ?

- (a) Both C - O bonds are formed by  $SP^3 - SP^3$  overlap.  
 (b) Both C - O bonds are formed by  $SP^2 - SP^3$  overlap.  
 (c) One C - O bond is formed by  $SP^2 - SP^3$  overlap, while the other C-O bond by  $SP^3 - SP^3$  overlap.  
 (d) Both bonds are formed by  $SP^2 - SP^3$  overlap.

2 In the compound, , how many sites are available for attack by of  $CH_3O^-$  ?

- (a) 1. (b) 2.  
 (c) 3. (d) 4.

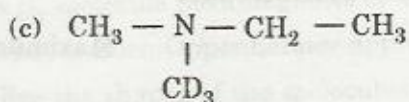
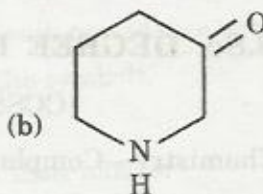
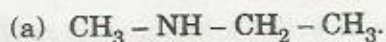


which is the order of stability of these carbocations :

- (a) I > II > III. (b) III > II > I.  
 (c) I > III > II. (d) II > I > III.

Turn over

4 In which of the following compounds, N atom is asymmetric ?



(d) All of these.

5 The purine base present in RNA is :

(a) Guanine.

(b) Thymine.

(c) Cytosine.

(d) Urasil.

6 The helical structure of protein is stabilized by :

(a) Dipeptide bonds.

(b) Hydrogen bonds.

(c) ether bonds.

(d) peptide bonds.

7 Which of the following is a polyamide ?

(a) Terylene.

(b) PMMA.

(c) Nylon-66.

(d) All of these.

8 The number of bases constituting nucleic acid is \_\_\_\_\_.

9 Enzymes \_\_\_\_\_ the activation energy of a reaction.

10  $E_2$  reaction is also called \_\_\_\_\_ or \_\_\_\_\_.

11 Chiral carbon is also called \_\_\_\_\_.

12 \_\_\_\_\_ is the monomer of cellulose.

(12 × ¼ = 3 weightage)

II. Short answer type questions. Answer all *nine* questions :

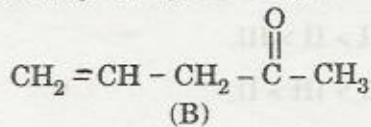
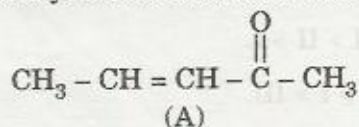
13 Addition of :  $\text{CCl}_2$  cyclopentene yield a single compound, what is it ?

14 What are ambiphiles ?

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15 Many nucleophiles are anions, but  $\text{BF}_4^-$  is not a nucleophile. Why ?

16 How could you differentiate the following Ketones by UV spectroscopy ?



- 17 What is Asymmetric synthesis ?
- 18 What are essential amino acids ? Give an example.
- 19 State isoprene rule ?
- 20 What is condensation polymerisation ? Give an example of condensation polymer.
- 21 Give the structural difference between water soluble and fat soluble vitamins ?

(9 × 1 = 9 weightage)

III. Short essay or paragraph questions. Answer any *five* questions :

- 22 How can you differentiate between  $\text{CH}_3\text{COOH}$  and  $\text{CH}_3\text{COCH}_3$  by IR spectroscopy ?
- 23 Discuss the quaternary structure of proteins.
- 24 Discuss the aromaticity of pyrrole and furan ?

- 25 Explain why  $\text{Cl} - \text{C} \begin{array}{l} \text{=O} \\ \text{O-H} \end{array}$  does not exist, but  $\text{Cl} - \text{C} \begin{array}{l} \text{=O} \\ \text{O C}_2\text{H}_5 \end{array}$  exists ?

- 26 Differentiate between thermoplastics and thermosetting plastics.
- 27 Draw the conformations of methyl cyclohexane. Which is the more stable conformation?
- 28 Acylation is always preferred to alkylation in Friedel-Craft's reaction. Explain.

(5 × 2 = 10 weightage)

IV. Essay Questions. Answer any *two* questions :

- 29 Discuss  $\text{SN}^2$  mechanism with a suitable example ? Why chloromethyl methyl ether,  $\text{Cl} - \text{CH}_2 - \text{O} - \text{CH}_3$ , undergoes ready  $\text{SN}^1$  solvolysis, even though it is a primary substrate ?
- 30 Discuss the primary, secondary and tertiary structure of proteins briefly.
- 31 What is Hückel's theory of aromaticity ? Discuss the aromaticity of non-benzenoid compounds.

(2 × 4 = 8 weightage)