

(6 pages)

7848/PC1

OCTOBER 2008

Paper I – ORGANIC CHEMISTRY

Time : Three hours

Maximum : 100 marks

Answer ALL the questions.

SECTION A — (20 × 1 = 20 marks)

Choose the correct answer :

1. The stability of an allylic carbanion is attributed to the conjugation of _____ electrons.

- (a) shared pair (b) unshared pair
(c) odd (d) none of these.

2. The valency of a carbon atom in a methyl radical is

- (a) one (b) two
(c) three (d) four.

3. The point group of H₂O molecule is

- (a) C_{3v} (b) C₃
(c) C₂ (d) C_{2v}.

4. Carbon tetrachloride molecule belongs to the _____ point group.

- (a) O_h (b) I_h
(c) T_d (d) None of these.

5. Oxidation of allylic alcohols with O₃O₄ gives

- (a) 1,2,3-triols (b) 1,2-diols
(c) 1,4-diols (d) None of them.

6. The preferred order of selenium dioxide oxidation reactivity is

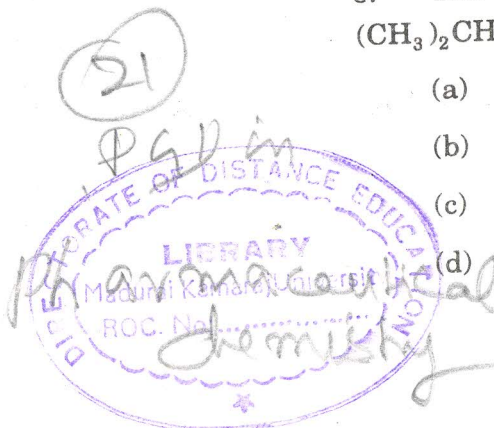
- (a) CH>CH₃>CH₂ (b) CH₂>CH₃>CH
(c) CH₂>CH>CH₃ (d) CH₃>CH₂>CH.

7. The synthons provided by RLi are

- (a) nucleophiles (b) electrophiles
(c) free radicals (d) none of them.

8. The synthetic equivalent for the synthon (CH₃)₂CH-CH⁺-OH is

- (a) (CH₃)₂CH-CO-CH₃
(b) (CH₃)₂CH-CH₂-CH₂OH
(c) (CH₃)₂CH-CH₂-CHO
(d) none of them.



9. The gradual change of specific rotation of a freshly prepared glucose solution in water is

- (a) mutarotation
- (b) due to oxidation
- (c) due to polymerisation.
- (d) none.

10. The following sugars form identical osazones.

- (a) Sucrose and galactose
- (b) sucrose and fructose
- (c) sucrose and glucose
- (d) glucose and fructose.

Say True or False :

11. Carbocations can be detected by electron spin resonance spectroscopy.

12. S_2 operation is equal to σ operation.

13. The direct reaction of an alkene with a peroxy acid gives an oxirane.

14. A disconnection of a molecule often takes place far away from the functional group.

15. Lactose is systematically named as 4- β -D galactopyranosyl - D - glucopyranose.

Fill in the blanks :

16. Diazirines on decomposition give _____.
17. C_1 , C_n and D_n point groups characterize the _____ molecules.
18. Selenium dioxide is used for the oxidation of both _____ to the corresponding alcohols.
19. Two carbonyl fragments are obtained from the disconnection of an _____ target molecule.
20. Oligosaccharides on hydrolysis give two to _____ monosaccharide molecules.

SECTION B — (5 × 6 = 30 marks)

21. (a) Explain the importance of product analysis in determining the reaction mechanisms.

Or

(b) Write a note on crossover experiments.

22. (a) Describe the symmetry elements possessed by water molecules.

Or

(b) Discuss the relation between molecular symmetry and chirality.

