Avinashilingam Institute for Home Science and Higher Education for Women
Coimbatore - 641043.

Master's Degree Examination – NOVEMBER 2017
First Semester

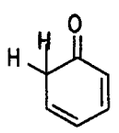
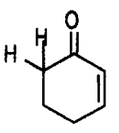
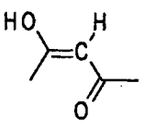
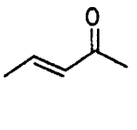
Class : I PG **Time: 3 hours**
Major : Chemistry **Max. Marks: 60**

17MCH01 ORGANIC CHEMISTRY-1

Part A **10 x 1/2 = 5**
Choose the correct answer

1. Which compound is likely to have the highest boiling point?
   a.$CH_3CH_2CH_2OH$. b. $CH_3COCH_2CH_3$ c. $CH_3CH_2CH_2SH$ d. CH_3CHO

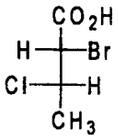
2. Which of the following compound shows most stable Tautomeric form

a.  b.  c  d 

3. A Carbanion has
   a. Sp^3 hybrid carbon b. Sp^2 hybrid carbon c. Sp hybrid carbon d. none of these

4. A singlet carbene has two electrons in
   a. two different orbital b. in same orbital c. in sporbital c. none of these

5. The R-S notation to chiral carbon C-2 and C-3 in the following structure will be



a.2S 3R b.2R 3S c.2S 3S d.2R 3R

6. Which one form of cyclohexane is most stable?
   a. Chair b. Half Chair c. Boat d. Twist boat

7. Which one of the following compounds readily undergoes S_N1
   a. CH_3Cl b. $CH_2{=}CHCl$ c. $CH_3CH_2CH_2Cl$ d.$CH_2{=}CH.CH_2Cl$

8. Under certain conditions an important side reaction in the conversion of *t*-butyl bromide to *t*-butanol with OH^- ions is
   a. formation of isobutene by elimination b. formation of hexamethylmethane by wurtz coupling
   c. isomerisation of *t*-butyl bromide d. stereo chemical inversion of the *t*-butyl bromide.

9. Which one of the following reactions gives alkyl halide as product?
   a. Sandmeyer reaction b. Darzen condensation c. Mannich reaction d. Willgerodt reaction

10. Oppenauer reaction is the reverse of following reaction
    a. Elbs persulphate oxidation b. Periodic acid oxidation
    c. Meerwein –Pondorf reaction d. None of these

Part B 5 x 4 = 20

Answer ALL questions

Each answer should not exceed 200 words or one page

11.a. (a) i. Illustrate aromaticity of Azulene (2)

ii. Differentiate between Resonance and Tautomerism with suitable example? (2)

(Or)

11. b. i) How do you find out the presence of Hydrogen bonds? (2)

ii) What do you mean by Inclusion compounds and explain with example. (2)

12. a. i. How Allene and Spirane system show optical isomerism?

(Or)

12. b. i) Explain the symmetry criterion of enantiotopic groups. (2)

ii) Predict the hydrogen atoms in cis1,2-dichlorocyclopropane and its trans isomer as homotopic, enantiotopic or diasterotopic. (2)

13. a. i. Compare the stability of following carbanions. (2)

a) $RC\equiv C^{\ominus}$ b) $Ar^{\ominus}$ c) $R_3C-CH_2^{\ominus}$ d) $R_2C=CH^{\ominus}$

ii. How are radicals generated via redox method? (2)

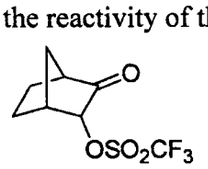
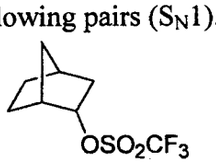
(Or)

13. b. i. Illustrate Kinetic versus thermodynamic control of product. (2)

ii. How is isotope labelling studies useful for ester hydrolysis? (2)

14. a. i. Account for the following observation: Front side attack of S_N2 reaction is not favoured (2)

ii) Compare the reactivity of the following pairs (S_N1). (2)

I)  and  ii) CH_3X and $RSCH_2X$

(Or)

14. b. i) Discuss the S_NAr mechanism with meisenheimer complex? (2)

ii) Discuss the evidence of S_N1 mechanism with aryl cation as intermediate. (2)

15. a. i. How solvent influences the chlorination of 2,3-dimethylbutane via radical mechanism?(2)

ii) Give an example of free radical reactions at bridgehead position? (2)

(Or)

15. b. i. Discuss the reaction and mechanism of Sommelet reaction? (2)

ii. Write the synthetic utility of Oppeneur oxidation (2)

Part C 5 x 7 = 35

Answer ALL questions

Each answer should not exceed 600 words or three pages

16.a. i. Write the differences between field effects and electromeric effects? (3)

ii. Discuss the Rules of Resonance. (4)

(Or)

16. b. i. Discuss the effect of hydrogen bond on the properties of compounds. (3)

ii. Write a short note on Crown ethers and Catenanes (4)

17. a. Explain the following with suitable example (I). Axial haloketone rule (2) II. Octant rule (2)

III. Chirality due to helical shape. (3)

(Or)

17. b. Discuss the conformationl analysis. (7)

18. a. i. Differentiate between Singlet and triplet carbenes using 2-Butene? (4)
ii. Explain Stability of alkyl substituted radicals via Baker Nathan effect. (3)

(Or)

18. b. Explain the following i. isotope effect (3) ii. Kinetic effect. (4)

19. a. i. Illustrate the following with suitable examples: I) NGP leads to retention of configuration II)
Stability of Non-classical carbocations. (3)
ii. How will you enhance leaving ability of following groups I) OH II) NH_2 (4)

(Or)

19. b. i. Illustrate ambident nucleophile and ambident substrate with suitable example? (4)
ii. Discuss the reaction and mechanism of Smiles rearrangement? (3)

20. a. i. Discuss the mechanism of allylic bromination. Why Br_2 is not suitable for allylic bromination? (4)
ii. Explain why in halogention reactions (free radical mechanism) electron withdrawing group greatly deactivate adjacent positions. (3) (Or)

20. b. i. Discuss the reaction and mechanism of Mannich reaction. (4)
ii. Illustrate the synthetic utility of Periodic acid. (3)

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