

STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI-86
(For candidates admitted during the academic year 2010 – 11)

SUBJECT CODE: CH/MC/OC34
B.Sc. DEGREE EXAMINATION, NOVEMBER 2011
BRANCH IV- CHEMISTRY
THIRD SEMESTER

REG.NO

COURSE : MAJOR CORE
PAPER : ORGANIC CHEMISTRY-I
TIME : 30 MINUTES

MAX.MARKS : 30

SECTION – A

(30x1=30)

ANSWER ON THE QUESTION PAPER ITSELF.

Answer all the questions.

I Choose the correct answer:

- Acrolein with Bromine water undergoes reaction
a) Addition b) Elimination c) rearrangement d) substitution
- The most common reactions that Aldehydes undergo is
a) electrophilic addition b) electrophilic substitution
c) nucleophilic addition d) nucleophilic substitution
- Which of the following compounds will give negative test with Fehling's solution
a) maltose b) sucrose c) cellobiose d) lactose
- Which of the following compounds yields yellow precipitate with $I_2/NaOH$.
a) Acetophenone b) Benzaldehyde c) Ethanal d) benzophenone
- The speed of an SN^1 reaction is maximum in which of the following medium?
a) alcohol b) $CHCl_3$ c) CCl_4 d) benzene
- According to Hofmann's elimination, the preferred product is
a) less substituted alkene b) more branched alkene
c) thermodynamic product d) most stable product
- Which of the following compounds on ozonolysis gives 2 moles of Acetaldehyde.
a) 2,3 – dimethyl – 2 – butene b) isobutene
c) 2 – butene d) 2 – methyl – 2 – pentene

II State true or false.

- In SN_1 reactions OH^- acts as a nucleophile, while it acts as a base during elimination.
- 2 – bromobutane on treatment with alc.KOH forms 1 – butene as the major product.
- Benzoin contains keto and hydroxy groups.
- E_2 elimination is a one step process.
- Fructose does not react with Tollen's reagent.

III Match the following:

- | | | |
|---|---|-------------------------|
| 13. $\text{NH}_2 \text{NH}_2 / \text{OH}^-$ | - | Clemmenson reduction |
| 14. $\text{Zn} / \text{Hg} / \text{HCl}$ | - | Wolff Kishner reduction |
| 15. Zn / HCl | - | Hydride ion |
| 16. H_2 / Pt | - | nascent hydrogen |
| 17. LiAlH_4 | - | catalytic hydrogenation |

IV Fill in the blanks:

18. The reaction of Methylketones with halogens in the presence of alkali is called reaction.
19. The catalyst used for Benzoin condensation is
20. $\text{S}_{\text{N}}1$ reaction proceeds with with respect to configuration
21. The hybridization of Carbon in the carbonyl group is.....
22. Benzaldehyde reacts with primary amines to give.....
23. Propene on hydroboration reaction yields alcohol
24. The reagent for cis hydroxylation is

V Answer in one or two sentences:

25. What is Fehling's reagent.
26. Write the tautomer of Propanone
27. How is a carbohydrate defined?
28. Give the structure of Semicarbazone of acetone
29. What are the two units present in starch?
30. Give any one example for the insertion reaction of Carbene



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SECTION – B
ANSWER ANY FIVE QUESTIONS

(5x6=30)

1. How can the formation of Benzyne be confirmed? Give any 3 proofs.
2. Complete the following equations (3x2)
 - a) acetaldehyde with glycol in the presence of HCl
 - b) $C_6H_5COCH_3 + HCHO + NH_3 \longrightarrow$
 - c) $C_6H_5CHO + CH_3NH_2 \longrightarrow$
3. Explain and Differentiate SN_1 and SN_2 mechanisms with an example each
4. a) Give the mechanism of HBr addition to Propyne.
b) Give one example of cis addition. (4+2)
5. a) Why is the α – hydrogen in carbonyl compounds acidic in nature.
b) Aqueous KOH forms substitution product, whereas alcoholic KOH forms eliminated product with 2-chloropropane. Why? (3+3)
6. How is aldohexose converted to a) aldopentose b) aldoheptose?
7. a) What is the product of HIO_4 Oxidation of glucose? (2+4)
b) Write the structures of epimer, enantiomer, diastereomer of glucose

SECTION – C
ANSWER ANY TWO QUESTIONS

(2x20=40)

8. a) How will you convert Benzaldehyde into
 - i) Cinnamic acid
 - ii) Benzyl alcohol
 - iii) Toluene
 - iv) Styrene
 - v) Benzalchloride(5x2=10)
b) Why do glucose and fructose form the same osazone? (4)
c) Differentiate the following by one specific test:
 - (i) Acetaldehyde & benzaldehyde
 - (ii) Acetophenone & benzophenone(2x3=6)

9. a) What will be the derivative formed when acetaldehyde reacts with
(i) HCN followed by hydrolysis (ii) Grignard reagent (iii) semicarbazide
(iv) Sodiumbisulphite (v) Phenyl hydrazine (5x2)
- b) An organic compound 'A' (C_4H_8O) shows intense 1700 cm^{-1} absorption and a positive Iodoform test. It is oxidized by Potassium dichromate to Methanoic and Propanoic acids. On reduction and further treatment with PCl_5 and KCN/HOH , it forms 'B' ($C_5H_{10}O_2$). Identify the compounds and explain the sequence. What is the isomer of A and how can the two be differentiated?. (10)
10. Explain the following reactions with Mechanisms (4x 5 = 20)
- Benzoin condensation
 - Crossed Cannizaro reaction
 - Knoevenegal reaction
 - Riemer Tiemer Reaction
 - Reformatsky reaction
11. a) What are the proofs for the presence of ring structure in Glucose? How is the ring size established? (15)
- b) Discuss the mechanism of 1,2 and 1,4 addition reactions in 1,3 – butadiene (2+3)

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