

STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI-86  
(For candidates admitted during the academic year 2004 –05 & thereafter)

SUBJECT CODE: CH/MC/OC34  
B.Sc. DEGREE EXAMINATION, NOVEMBER 2007  
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 :

6x1=6

- The hybridization of carbon in  $\begin{array}{l} \diagup \\ \text{C} = \text{O} \\ \diagdown \end{array}$  is  
a) sp<sup>3</sup>                                      b) sp<sup>2</sup>                                      c) sp    d) sp<sup>3</sup>d
- The product formed during base catalysed hydrolysis of ester in  $\text{H} - \overset{18}{\text{O}} - \text{H}$  medium is  
a)  $\text{R} - \overset{\text{O}}{\parallel} - \overset{18}{\text{O}} - \text{H}$       b)  $\overset{18}{\text{O}} - \text{R} - \text{H}$       c)  $\text{R} - \overset{\text{O}}{\parallel} - \overset{18}{\text{O}} - \text{R}'$       d)  $\text{H} - \overset{18}{\text{O}} - \overset{18}{\text{O}} - \text{H}$
- Phenol on treatment with phthalic anhydride gives  
a) Salicylic acid      b) Phenolphthalein      c) Bakelite      d) Methyl red
- Among the isomers of phenols is p-nitro phenol, o-nitro phenol, m-nitro phenol - the one which is least acidic is  
a) o-nitro phenol    b) p-nitro phenol  
c) m-nitro phenol    d) all the three have the same acidity
- Acetamide on heating with P<sub>2</sub>O<sub>5</sub> gives  
a) acetic acid      b) acetic anhydride      c) aceto nitrile      d) methyl acetate
- The most reactive acid derivative is  
a) acid chloride                                      b) acetic anhydride                                      c) ester                                      d) acetamide

II. State true or false :

6x1=6

- Phenoxide ion is more stable than phenol.
- Benzoic acid on reduction with LiAlH<sub>4</sub> gives benzylalcohol.
- Acetamide on treatment with Br<sub>2</sub>/NaOH gives methyl amino.
- Benzaldehyde reacts with primary amines to gives schiffs bases.
- Benzoin contains keto and hydroxy group.
- Isopropyl alcohol on passing over copper heated over 300°C gives acetone.

**III. Fill in the blanks:****6x1=6**

13. The isomerism between by acetone and propanal is known as \_\_\_\_\_.
14. Calcium acetate on heating gives calcium carbonate and \_\_\_\_\_.
15. Salicylic acid can be prepared from sodium phenoxide by treating with \_\_\_\_\_.
16. The reaction between benzoyl chloride and alcohol is known as \_\_\_\_\_ reaction.
17. Benzoic acid on chlorination gives \_\_\_\_\_.
18. Amino acids give purple complex with \_\_\_\_\_.

**IV. Answer the following questions in one or two sentences:**

19. State Hofmann's and Saytzeff's rules. (2+2=4)
  
20. Arrange the following in increasing order of acidity  
 $\text{NO}_2\text{CH}_2\text{COOH}$ ,  $\text{CH}_3\text{CH}_2\text{COOH}$ ,  $\text{ClCH}_2\text{COOH}$ ,  $\text{ICH}_2\text{COOH}$  (2)

**V Match the following:**

- |                         |   |   |
|-------------------------|---|---|
| 21. Clemenson reduction | - | H <sub>2</sub> /Pd – BaSO <sub>4</sub>            |
| 22. Wolff's reduction   | - | [Ag(NH <sub>3</sub> ) <sub>2</sub> ] <sup>+</sup> |
| 23. Tollens reagent     | - | NH <sub>2</sub> .NH <sub>2</sub>                  |
| 24. Fehlings reagent    | - | Cl <sub>2</sub> /NaOH                             |
| 25. Haloform reaction   | - | Zn/Hg   |
| 26. Rosemund reduction  | - | Cu <sup>2+</sup>                                  |

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**TIME : 2 ½ HOURS**

**MAX.MARKS : 70**

**SECTION – B**

**Answer any five questions.**

**(5x6=30)**

1. What is the isomerism exhibited by fumaric and maleic acids? Discuss three methods to distinguish between them. (6)
2. Discuss mechanism of Benzoin Condensation. (6)
3. Explain a) Kolbe reaction                      b) Reimer Tiemann reaction (3+3)
4. a) What is the action of heat on adipic acid?  
b) What is Perkin reaction? (3+3)
5. Explain a) aldol condensation    b) Cannizaro reaction (3+3)
6. Explain the following be synthesized:  
i) Phenolic ketone by Houben-Hoesch method.  
ii) Glycine by Gabriel's synthesis  
iii) Alanine by Strecker's synthesis (3x2=6)
7. Discuss the mechanism of HVZ reaction. (6)

**SECTION - C**

**Answer any two questions.**

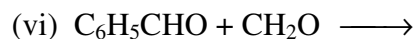
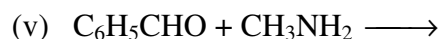
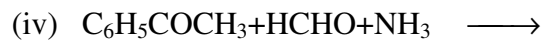
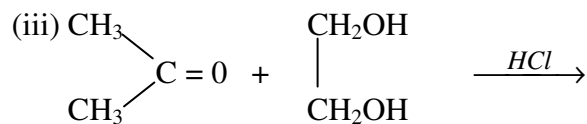
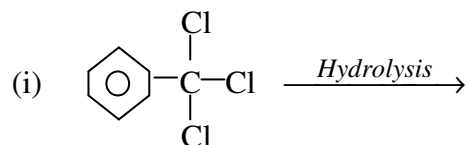
**(2x20=40)**

8. a) What are the reactions between  $\text{NH}_2\text{OH}$  and  $\text{NH}_2\text{NH}_2$  with acetone and acetaldehyde? (6)  
b) Explain the mechanism of (1,2) and (1,4) addition reaction of 1,3-butadiene with HCl. (4)  
c) Compound A on ozonolysis gives  $\text{CH}_3\text{COCH}_3$  and  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CHO}$ . Identify A and explain. (4)  
d) Explain Blanc's rule. (6)

9. a) Compare  $S_N1$  and  $S_N2$  mechanisms .(any six points) (8)  
 b) Discuss 'Benzyne' mechanism of aromatic nucleophilic substitution with proof (8)  
 c) What is the action of  $HNO_2$  and  $HCHO$  on glycine. (4)
10. a) What is the action of heat on  $\alpha, \beta, \gamma$  amino acids. (6)  
 b) Complete the following reaction.  

$$CH_3COOH \xrightarrow{PCl_5} A \xrightarrow{CH_3COONa} B \xrightarrow{PCl_5} C \xrightarrow{NH_3} D$$

$$D \xrightarrow{HNO_2} E \xrightarrow{CH_3OH} F$$
 (6)
- c) Give two tests to distinguish between aldehydes and ketones. (4)  
 d) Write the tautomers of acetone and give proof for the two forms. (4)
11. a) Discuss  $E2$  mechanism. (5)  
 b) What is CIS elimination? (3)  
 c) Complete the following equations (6x2)



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