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No. of Printed Pages: 3

SARDAR PATEL UNIVERSITY
B.Sc. THIRD SEMESTER EXAMINATION – 2013
COURSE NO : US03CCHE01
SUBJECT : ORGANIC CHEMISTRY

DATE : 13/11/2013

TIME : 2:30 P.M. TO 5:30 P.M.

DATE : WEDNESDAY

TOTAL MARKS : 70

Que : 1 Choose the correct option and rewrite the answer of the following. [10]

- Which of the following statement true about enantiomer ?
(a) Rotate plane polarized light (b) Are super imposable mirror image
(c) Are nonsuper imposable mirror image (d) None of these
- How many optical isomer are possible for 2,3,Dichlorobutane ..
(a) 2 (b) 4
(c) 6 (d) 9
- Which of the following is used as an antifreeze ?
(a) Glycerole (b) Ethylene Glycole
(c) Picric acid (d) Diethyl ether
- Which of the following alcohol is easy for oxidation ?
(a) Ethanol (b) 2,Methyl,2-Butanol
(c) 2,Methyl,2-Propanol (d) Isopropyl alcohol
- The carbon atom of carbonyl group is.....
(a) SP Hybridized (b) SP² Hybridized
(c) SP³ Hybridized (d) None of these
- Reduction of an imine will give an ...
(a) Amine (b) Acid
(c) Amide (d) Alcohol
- Which of the following is stereo selective reducing agent ...
(a) 9-BBN (b) KMnO₄
(c) Al₂O₃ (d) LiAlH₄
- Which of the following is not carboxylic acid...
(a) Acetic acid (b) Malonic acid
(c) Picric acid (d) Adipic acid
- Which of the following compound is possessed analgesic an antipyretic properties.?
(a) Piperine (b) Hexestrol
(c) Phenacetin (d) Thymol
- In adipic acid HCOO - (CH₂)_n-COOH where n is equal to...
(a) 1 (b) 4
(c) 2 (d) 3

- Que : 2** Answer the following. [Attempt any ten] [20]
1. Axial methyl cyclohexane is less stable than equatorial methyl cyclohexane.
 2. The priority order of group is $-\text{CN} > \text{CHO} > \text{CH}(\text{CH}_3)_2$. Explain.
 3. Cyclopentane is planar "Puckered" conformation while cyclobutane is a non-planar "folded" conformation. Explain.
 4. Give the synthesis of 3-Methyl,1-butene from methanol and isobutyl alcohol.
 5. Tertiary alkyl halide cannot be used in Williamson ether synthesis. Explain.
 6. Write a note on base catalyzed cleavage of Epoxide.
 7. Write the synthesis of 1,2,3-Tribromo benzene from p-Nitro aniline.
 8. How can you distinguish $1^\circ, 2^\circ$ and 3° Amine with illustration.
 9. Explain it is necessary to adjust the reaction mechanism to just the right acidity in nucleophilic addition to aldehyde and ketone.
 10. Write Kolbe reaction with illustration.
 11. α -Chlorobutyric acid is stronger acid than β -Chlorobutyric acid.
 12. o-Nitro phenol is less water soluble than p-Nitro phenol. Explain.

- Que : 3** Draw and discuss all possible conformational isomers of Cyclohexane with Potential energy diagram and arrange them in increasing order of stability and also discuss the factors affecting stability of conformation. [10]

OR

- Que : 3** Cis -1,2-Cyclopentane diol cannot be resolved whereas Trans -1,2-Cyclopentane diol is resolvable and also explain Trans-1,2-Dimethyl cyclohexane is a configurational enantiomer while Cis-1,2-Dimethyl cyclohexane is a conformational enantiomer. [10]

- Que : 4** Answer the following. [06]
- (A) (i) Alcohol act as Acid and Base. Explain.
(ii) Define Grignard reagent with its limitation.
- (B) Write reaction mechanism of Pinacol-Pinacolone rearrangement. [04]

OR

- Que : 4** Answer the following [06]
- (A) (i) Give the synthesis of 3-Methyl,2-Pentanol from Ethyl alcohol by Grignard synthetic route.
(ii) Justify: HIO_4 is used as powerful tool in the structure determination of alcohol.
- (B) Discuss the oxidation reaction of Glycerol using different oxidizing agents. [04]

- Que : 5** Give the reaction mechanism of the following. [06]
- (A) (i) Acetaldehyde + 2-Moles of Ethyl alcohol $\xrightarrow{\text{Dry HCl}}$?
- (ii) Two Moles of Acetone $\xrightarrow{\text{NaOH}}$?
- (B) Describe the action of Nitrous acid on Aliphatic amine and Aromatic amine. [04]

OR

- Que : 5** Answer the following. [06]
- (A) (i) Explain Aromatic amines are weak base than ammonia.
(ii) Give stepwise detail mechanism of Acid catalyzed halogenations of Ketone
- (B) Write short note on reductive amination. [04]

- Que : 6** Complete and rewrite the following reaction and write appropriate mechanism. [04]
- (A) Cumene $\xrightarrow{\text{O}_2}$? $\xrightarrow{\text{H}_2\text{O}/\text{H}^+}$? + ?
- (B) (I) Phenol are more acidic than alcohol. [06]
(II) Give the synthesis of Valeric acid from Malonic ester

OR

- Que : 6** Answer the following [04]
- (A) Write reaction mechanism for Reformatsky reaction. [04]
- (B) Complete the reactions and give correct structural formula of the following. [06]
- (1) p-Toluic acid + fuming $\text{H}_2\text{SO}_4 \longrightarrow$ A ($\text{C}_8\text{H}_8\text{O}_5\text{S}$)
 - (2) A + KOH $\xrightarrow{\text{Fusion}}$ B ($\text{C}_8\text{H}_8\text{O}_3$)
 - (3) B + Na, alcohol \longrightarrow C ($\text{C}_8\text{H}_{14}\text{O}_3$)
 - (4) C + HBr \longrightarrow D ($\text{C}_8\text{H}_{13}\text{O}_2\text{Br}$)
 - (5) D + Base, Heat \longrightarrow E ($\text{C}_8\text{H}_{12}\text{O}_2$)
 - (6) E + $\text{C}_2\text{H}_5\text{OH}$, HCl \longrightarrow F ($\text{C}_{10}\text{H}_{16}\text{O}_2$)
 - (7) F + CH_3MgI , then $\text{H}_2\text{O} \longrightarrow$ α -terpineol ($\text{C}_{10}\text{H}_{18}\text{O}$)
