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[127 E+G]

**SARDAR PATEL UNIVERSITY**

**B. Sc. IV$^{th}$ - Semester Examination**

**US04CCHE21 : ORGANIC CHEMISTRY**

**Date : 09 - 04 - 2022,** Saturday **Time : 03:00 to 05:00 p.m.**

**Total Marks: 70**

**Note :** (1) All questions are to be attempted. (2) Figures to the right indicate marks.

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**Q.1 Choose the correct option for the following** **[10]**

(1) Which Conformer of Cyclohexane is most stable?
(a) Chair (b) Boat
(c) Half-Chair (d) Twist boat

(2) How many stereo isomers are possible for 2, 3-dichloro pentane.
(a) 2 (b) 3
(c) 4 (d) 8

(3) Optical Isomers that are mirror image of each other are called .....
(a) Tautomers (b) Diastereomers
(c) Enantiomers (d) Metamers

(4) Which of the following compound is suitable for aldol condensation.
(a) Formaldehyde (b) Acetaldehyde
(c) Benzaldehyde (d) Di-phenyl ketone

(5) Phenol with Kolbe reaction gives .....
(a) Benzoic acid (b) Cinnamic acid
(c) Salicyaldehyde (d) Salicylic acid

(6) (+) Glucose can be converted into (-) Arabinose by .....
(a) Killiani-Fisher synthesis (b) Ruff-degradation
(c) Haworth synthesis (d) Hudsan method

(7) Which of the following is 2-Ketohexose.
(a) Mannose (b) Galactose
(c) Glucose (d) Fructose

(8) Which of the following is a diasaccharide.
(a) Lactose (b) Glucose
(c) Fructose (d) Cellulose

(9) Which of the following is most acidic.
(a) Acetic acid (b) Chloro acetic acid
(c) Formic acid (d) Phenol

(10) Which of the following is most basic.
(a) 2-nitro aniline (b) 2, 4-dinitro aniline
(c) 2, 4, 6-trinitro aniline (d) aniline



**Q.2 Fill in the blanks** **[08]**

(1) 1 dm. = ..... (100 cm. / 10 cm.)
(2) 2-chloro propanoicacid is optically ..... (active / inactive)
(3) ..... alcohol does not oxidized. (Secondary / Tertiary)
(4) The Reimer-Tiemann reaction of phenol gives.....
(Salicylic acid / Salicyaldehyde)
(5) Glucose and Galactose both are ..... (epimers / geometrical isomers)
(6) Glucose reacts with $HNO_3$ to produce.....carboxylic acid. (mono / di)
(7) Formic acid is ..... acid as compare to acetic acid. (weak / strong)
(8) The basicity of methyl amine is ..... than aniline. (more / less)



(P.T.O)

**Q.3 Answer the following (Attempt any Ten)** [20]

(1) Define the terms: Enantiomers and Diastereomers.
(2) Write down the factors affecting the stability of conformations.
(3) Explain, Eclipsed conformer of ethane is less stable than staggered conformer.
(4) Discuss the Kolbe reaction with example.
(5) Give the synthesis of 1-phenyl ethanol from benzene.
(6) Give the synthesis of 3-methyl-1-butene from methanol and iso butyl alcohol.
(7) What are carbohydrates? How are they classified?
(8) Explain Osazone formation.
(9) Explain the reaction of glucose with $H_2$/Ni and HCN
(10) Alcohol is neutral as compare to phenol? Why?
(11) Give difference between Tautomerism & Resonance.
(12) Why Acetamide is less basic than Ethyl amine.



**Q.4 Answer the following (Attempt any Four)** [32]

(1) What is Conformation? By using Newman formula, Draw various conformation of n-butane resulting from rotation about $C_2$-$C_3$ bond through $60^0$ and explain their stability with potential energy diagram and arrange them in increasing order of stability.
(2) Draw all possible Conformational isomers of Cyclohexane and explain their stability with potential energy diagram and arrange them in increasing order of stability.
(3) Complete the following reaction and give appropriate detail mechanism of:

Isopropyl benzene (Cumene) $\xrightarrow[(2)\ H_2O/H^+]{(1)\ O_2}$ ..... + .....

(4) Write the detail stepwise mechanism of Gatterman synthesis.
(5) Give the Synthesis of (+) Glucose from (-) Arabinose.
(6) Prove that: (+) Lactose is a galactoside and not a glucoside.
(7) Arrange the following in increasing order of their basicity: $NH_3$, $(CH_3)_2NH$, $(CH_3)_3N$, $CH_3NH_2$ and Why?
(8) Arrange the following in increasing order of their acidity: Picric acid, Phenol, 2-$NO_2$ Phenol, 2, 4-dinitro phenol and Why?