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[10]

SARDAR PATEL UNIVERSITY

Bachelor of Science (Semester 3) Examination - 2022

US03CICV52: Fundamentals Of Organic Chemistry

Date: 21st November 2022, Monday

Time: 10:00 AM to 01:00 PM

Total: 70 Marks

NOTE: Figure to the right indicate full marks of the questions. ¶

Q-1 Multiple Choice Questions

[10]

- Which of the following is less stable carbocation?
(a) CH_3^+
(b) $(\text{CH}_3)_3\text{C}^+$
(c) CH_3CH_2^+
(d) $(\text{CH}_3)_2\text{CH}^+$
- The decreasing order of "s" character in the three hybrid orbitals is
(a) $sp > sp^2 > sp^3$
(b) $sp^3 > sp^2 > sp$
(c) $sp^2 > sp > sp^3$
(d) None of these
- A Nucleophile is _____
(a) Lewis acid
(b) Electron deficient species
(c) An electron rich species.
(d) None of these
- What does $\text{CH}_3\text{-CO-CH}_2\text{-CH}_2\text{-CH}_2\text{-CH}_3$'s name stand for?
(a) Hexan-1-one
(b) Hexan-2-one
(c) Pentan-1-one
(d) Pentan-2-one
- Resorcinol on distillation with zinc dust gives
(a) Benzene
(b) Cyclohexane
(c) Toluene
(d) m-xylene
- Which of the following is the strongest acid?
(a) Formic acid
(b) Dichloroacetic acid
(c) Acetic acid
(d) Trifluoroacetic acid
- Conc. HNO_3 and conc. H_2SO_4 react with benzoic acid to form
(a) o-nitrobenzoic acid
(b) p-nitrobenzoic acid
(c) m-nitrobenzoic acid
(d) o,p-dinitrobenzoic acid
- Which of the following ketones has the common term acetone?
(a) Dimethyl ketone
(b) Ethyl methyl ketone
(c) Diethyl ketone
(d) N-propyl ketone
- Which of the following compound is a secondary amine?
(a) $\text{CH}_3\text{-CH}(\text{NH}_2)\text{-CH}_3$
(b) $\text{H}_2\text{NCH}_2\text{CH}_2\text{NH}_2$
(c) $\text{CH}_3\text{CH}_2\text{NHCH}_3$
(d) $(\text{CH}_3)_3\text{N}$
- A primary amine can be identified using
(a) HCl
(b) $\text{CHCl}_3 + \text{KOH}$
(c) NaOH
(d) CHCl_3

[1]

(870)

Q-2 Short Answer Question (Attempt TEN out of TWELVE)

[20]

1. Explain the boiling point Dimethyl ether and ethanol.
2. Define term steric effect.
3. Define term electronic effect.
4. Which do you expect to have the higher boiling point: o-chloro phenol or m-chloro phenol? Why?
5. Why 2-chlorobutanoic acid is a stronger acid than butanoic acid?
6. Explain homolytic cleavage of covalent bond.
7. Why p-nitrophenol have high boiling point and higher water solubility than o-nitrophenol?
8. Write a reaction of alcohols.
9. Explain the acidity of dicarboxylic acid.
10. Differentiate a direct and indirect method of diazotization reaction.
11. Write a synthesis of 1,2,3-tri bromo benzene.
12. Why amines are weaker basic?

- Q-3 (A) Write a short note on Inductive effect & Steric effect. [05]
(B) Write a short note on Carbanions & Carbocation. [05]
OR
(A) Write a short note on resonance effect. [05]
(B) Explain Hydrogen bonds in details. [05]
- Q-4 (A) Write a note on 'Ethers'. [05]
(B) Write a note on "Oxymercuration-demercuration" reaction. [05]
OR
(A) Write a note on acid catalyzed dehydration of alcohol. [05]
(B) Write a note on the addition of Grignard reagent in carbonyl compound. [05]
- Q-5 (A) Write a short note on Cross-aldol condensation. [05]
(B) Discuss the Transesterification reaction in details. [05]
OR
(A) Explain the synthesis of a carboxylic acid in details. [05]
(B) Discuss the Hell-Volhard-Zelinsky reaction. [05]
- Q-6 (A) Write a short note on methods of diazotization reaction. [05]
(B) Discuss the reactions of amine with nitrous acid. [05]
OR
(A) Write a note on analysis of amines. [05]
(B) Write a synthesis of 1,2,3 tri bromo benzene from p-nitro aniline. [05]

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[22]