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## Sardar Patel University

B. Sc. (Semester – III) Examination

Date: 14-06-2022, Tuesday

Time: 12:00 – 02:00 PM

Industrial Chemistry

COURSE NO: US03CICH22 (Organic Chemistry)

Notes: Figures to the right indicate full marks. 14/06/22

Total marks: 70

Q.1 Answer the following Multiple-Choice Questions. (All are compulsory) (10)

- Phenol is used in .....
  - As moth repellent
  - In alcoholic beverages
  - As anesthetic
  - In antiseptics
- Which of the following compound is Aspirin?
  - Methyl Salicylate
  - Salicylic Acid
  - Phenyl Salicylate
  - Acetyl Salicylic Acid
- Sodium phenoxide reacts with  $\text{CO}_2$  at  $125^\circ\text{C}$  under 5 atm pressure to give salicylic acid is known as .....
  - Kolbe's reaction
  - Perkins reaction
  - Wurtz reaction
  - HVZ reaction
- The carbonyl group is ....
  - $\text{Sp}$  hybridized
  - $\text{Sp}^2$  hybridized
  - $\text{Sp}^3$  hybridized
  - None of these
- Which statement about the carbonyl compound is NOT true?
  - The carbonyl carbon is  $\text{sp}^2$  hybridized
  - The bond angles among the three atoms attached to carbonyl carbon is  $120^\circ$ .
  - The three atoms attached to the carbonyl carbon forms a nonplanar symmetry
  - The carbonyl group forms resonance structures
- Acetone contains.....
  - Nine  $\sigma$  bond plus one  $\pi$  bond
  - Ten  $\sigma$  bonds
  - Eight  $\sigma$  bond plus two  $\pi$  bond
  - Nine  $\pi$  bond plus one  $\sigma$  bond
- Which of the following heterocyclic compounds is not aromatic?
  - Pyridine
  - Pyrrole
  - Furan
  - Piperidine
- The 'N' atom in pyridine is.....
  - $\text{sp}^3$  hybridized
  - $\text{sp}^2$  hybridized
  - $\text{sp}$  hybridized
  - cannot be predicted
- All carbon atoms in Naphthalene are.....
  - $\text{sp}$  hybridized
  - $\text{sp}^3$  hybridized
  - $\text{sp}^2$  hybridized
  - None of these
- Naphthalene undergoes reduction with  $\text{H}_2$ , in the presence of Ni catalyst at high temperature and pressure to give.....
  - Phthalic acid
  - Decalin
  - Benzoic acid
  - Tetralin

(1)

(P.T.O)

Q.2 Answer the following. (All are compulsory)

(08)

1. Methyl alcohol is produced by fermentation of sugars. True / False?
2. Cyclic ethers with three-membered ring are called "Lactones". True / False?
3. In succinic acid  $\text{HOOC}(\text{CH}_2)_n\text{COOH}$ , where n is equal to 1. True / False?
4. Acetic acid is stronger acid than monochloroacetic acid. True / False?
5. Thiophene is five membered rings which is most resonance stabilized among others five-member heterocyclic ring. True / False?
6. 2,5-dibromothiophene is the main product when thiophene reacts with  $\text{Br}_2$  in benzene. True / False?
7. The Friedel-Crafts reaction of Naphthalene with Succinic anhydride using Nitrobenzene as a solvent give .....as a main product.
8. A reaction of Anthracene with Acetyl chloride using  $\text{AlCl}_3$  and Nitrobenzene at lower temperature give.... as a main product.

Q.3 Answer the following short questions (Attempt Any 10 out of 12)

(20)

1. Explain the physical properties and preparation of ethers.
2. Dimethyl ether and ethanol have the same molecular weight but ethanol has a much higher boiling point. Why?
3. Why acetic acid is a weaker acid than formic acid?
4. Define term "Enolization".
5. Why, the typical reaction of aldehydes and ketones is Nucleophilic addition?
6. Why, Carboxylic acids are more acidic than Alcohols?
7. Define term "Heterocyclic compound", write few examples of six members heterocyclic compounds.
8. Write synthesis of Pyrrole.
9. Write synthesis of Furan and Thiophene.
10. Explain Nitration reaction in alfa-Naphthol.
11. Write a reaction for "Friedel Crafts alkylation of Naphthalene with  $\text{C}_2\text{H}_5\text{I}$  in presence of  $\text{AlCl}_3$ ".
12. Write a reaction for "Sulponation of Naphthalene with conc  $\text{H}_2\text{SO}_4$  at  $80^\circ\text{C}$ .

Q.4 Answer the following Long questions (Attempt Any 04)

(32)

1. Write a note on base catalyzed cleavage of epoxide.
2. Write a note on "Oxymercuration-demercuration" for preparation of alcohol.
3. Write a note on "Transesterification reaction".
4. Write a note on "Acidity of carboxylic acids".
5. Discuss the structure of Pyrrole.
6. Discuss the "Nucleophilic substitution" in Pyridine.
7. Give Haworth's synthesis of Naphthalene & Anthracene.
8. Discuss the structure of Naphthalene & Anthracene in terms of molecular orbital picture.

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