SHIVAJI UNIVERSITY, KOLHAPUR

Question bank for Mar 2022 (Summer) Examination

Subject Code – 78909

Subject Name - Organic Chemistry Paper VIII-DSC-D4

Unit 1: Carboxylic acids and their derivatives

Q.1 Select the most correct alternatives from among those given below.

1. ……..of the following is mono carboxylic acid.

(a) Oxalic acid (b) Succinic acid (c) Formic acid (d) Citric acid.

2. Derivatives of carboxylic acid are hydrolyzed into …….

(a) alcohols (b) acyl Chlorides (c) thio ethers (d) carboxylic acid

3. Citric acid is ……

(a) halo acid (b) hydroxy acid (c) unsaturated acid (d) mineral acid

4. Acyl chloride can be obtained……...

(a) by direct esterification (b) By dehydration of acid

(c)fromcyanohydrine reaction (d) From Carboxylic acid

5. Anhydride can be converted in to Carboxylic acids by……..

(a) oxidation (b)ammonolysis(c) hydrolysis (d) decarboxylation

6. ……is not a hydroxy acid.

(a) Glycolic acid (b) Malic acid (c) Succinic acid (d)Citric acid

7. Phthalic acid on heating forms……

(a) Phthalicunhydride (b) Benzoic acid (c)Cinnamic acid (d) Succinic acid

Q.2. Answer the following in one sentence.

1. What are hydroxy acids?
2. What is the action of KCN on chloroacetic acid?
3. Give one example of unsaturated acid?
4. Which reaction is useful to prepare halo-acids?
5. What is used as an acetylating reagent?
6. What is the action of $KMnO_4$ on Malic acid?
7. What is action of bromine on Cinnamic acid?

Q. 3. Long answer type questions.

1. Give the method of preparation and uses of acetyl chloride.
2. Give methods of preparation of following:-
    a) Monochloro acetic acid
    b) Dichloro acetic acid
    c) Trichloro acetic acid
3. Give any two methods of preparation of acrylic acid and cinnamic acid.
4. What happens when ……
    a) Succinic acid is treated with C_2H_5OH/H^+
    b) Phthalic acid is heated with sodalime
    c) Citric acid is heated at 425K
5. What is the action of following on cinnamic acid?
    a) Br_2 b) $KMNO_4$ c) CrO_3
6. What is action of following reagents on monochloro acetic acid.
    a) KCN b) NaOH c) KI d) NH_3
7. How acetic unhydride is prepared? What are chemical properties and uses of acetic unhydride.

Q.4. Short answer question.

1. What are dicarboxylic acid? Give method of preparation of Phthalic acid from naphthalene.
2. What are carboxylic acid derivatives? Name different classes with an example each.
3. Write note on classification of monocarboxylic acid.
4. Explain bromination and oxidation reaction of cinnamic acid.

Unit 2: Amines and Diazonium Salts

Q.1 Select the most correct alternatives from among those given below.

1. The primary amines contain the functional group…….

   (a) $-NH_2$ (b) >NH (c) –N< (b) any of these

2. The aliphatic primary amines have $-NH_2$ group linked to ……. Group

   (a) alkyl (b) alkenyl (c) aryl (b) any of these

3. Ammonolysis of alkyl halides is ……..

   (a) unselective (b) inefficient (c) aryl amines cannot be prepared (b) all of these

4. Hoffmann degradation method of amine synthesis forms ……. Amines

   (a) alkyl (b) alkenyl (c) aryl (b) any of these

5. Bromination of aniline with Br_2 water forms …….. bromoaniline

   (a) orthol (b) para (c) tri (b) a mixture of these

6. The reaction by which benzene diazonium salt is prepared is called ……reaction

   (a) Sandmeyer (b) Gatterman (c) Diazotization (b) none of these

7. Orange dye is prepared by treating benzene diazonium salt with …….

   (a) phenol (b) ß-naphthol (c) N-N-dimethyl aniline (b) any of these

8. Coupling of naphthanoic acid with diazotized …….. formsCongored.

   (a) benzene (b) aniline (c) p-toludine (b) benzidine

Q.2. Answer the following in one sentence.

1. What are amines?
2. What is ammnolysis?
3. What is Hofmann's rearrangement?
4. What is diazonium salt?
5. What is Sandmeyer reaction?
6. What is coupling reaction?
7. How methyl orange is synthesized?

Q. 3. Long answer type questions.

1. Explain the classification and nomenclature of amines with suitable examples.
2. How do you prepare an amine from Cyanide and Amide.

3. Explain the mechanism of following reactions w.r.t. aniline

a) Bromination b) Nitration

4. What is diazotization? Describe the method of preparing of benzene diazonium chloride.
5. Give any four synthetic applications of benzene diazonium chloride
6. How will you convert benzene diazonium chloride into benzene and phenol?
7. What is the action of following reagents on benzene diazoniumchloride

a) aqueous KI b) water

8. Give the synthesis of methyl orange and congo red.

Q.4.Short answer question.

1. Sandmeyer reaction.
2. Replacement reaction of diazonium salt.
3. Coupling reactions of benzene diazonium salt.
4. Synthetic importance of benzene diazonium salt.
5. Gabrial synthesis of primary amine
6. Write synthesis of Methyl orange.
7. Write synthesis of Congo-red.

Unit 3: Carbohydrates

Q.1 Select the most correct alternatives from among those given below.

1.Anomers are pair of stereoisomers differing in –OH group orientation at …….

(a) chiral carbon (b) anomeric carbon (c) astereocentre (b) two stereocentres

2. A reducing sugar reacts with the ……. reagent.

(a) Benedits (b) Fehling's (c) Tollen's (b) none of these

3. A reducing sugar gives red precipitate with reagents…….

(a) Benedits (b) Fehling's (c) Tollen's (b) both a and b

4. Polyhydroxy aldehydes are called ……

(a) aldose (b) polyaldehydes (c) ketoses (b) polysaccharides

5. Carbohydrates is the term used in include ……..

(a) polyhydroxy aldehydes (b) polyhydroxykketone

(c) derivatives of a and b (b) all of these

6. The sugar …….. is also called as invert sugar.

(a) glucose (b) sucrose (c) lactose (b) maltose

7. …….is a non-reducing disaccharide.

(a) Galactose (b) Lactose (c) Invert sugar (b) maltose

8. Fructose is …….

(a) aldopentose (b) ketopentose (c) ketohexose (b) none of these

Q.2. Answer the following in one sentence.

1. What are hecarbohydrates ?
2. What is Oligosaccharides?
3. What is reducing sugar?
4. What is non-reducing sugar?
5. What is epimers?
6. What is homopolysaccharides?
7. What is heteropolysaccharides?

Q. 3. Long answer type questions.

1. What are carbohydrates? Give a scheme to classify them.

2. Define and explain the term disaccharide. Give the structure of lactose, maltose, sucrose.

3. Establish open chain structure of D (+) glucose and fructose.

4. How will you arrive at the configuration of D(+) glucose?

5. How will you prove the presence for obtaining D(+) glucose from D-arabinose.

6. What are polysaccharides? How they are classified. Explain the structure and uses of starch.

Q.4.Short answer question.

1. Explain ring structure of glucose.
2. Explain reducing and non-reducing sugar.
3. Write note on classification of carbohydrate.
4. Write note on Disaccharides.
5. Explain Hexagonal structure of œ-D-glucopyranose.
6. Write note on Mutarotation.

Unit 4: Carbonyl compounds Aldehydes and Ketones

Q.1 Select the most correct alternatives from among those given below.

1. The carbonyl group in aldehyde is joined to…….

   (a)two hydrogen atoms(b) least one H atom (c) No H atom (d) Either A or C

2. The carbonyl carbon of aldehydes and ketones is …….. hybridised.

   (a) Sp3 (b) Sp (c) Sp^2 (d) Sp^3d

3. The carbonyl carbon of aldehyde and ketone bear…….bonds.

   (a) one sigma and two pi (b) one pi and two sigma

   (c) one pi and three sigma (d) one sigma and three pi

4. Aldol condensation is shown by aldehydes ……

   (a) carrying hydrogen atom (b) not carrying hydrogen atom

   (c) other than formaldehyde (d) carrying alpha-hydrogen atom

5. Aldol condensation is carried out in presence of ……

   (a) mild and dilute alkali (b) Dilute acid

   (c) concentrated alkali (d) $AlCl_3$

6. Reformatsky reaction is carried out in presence of ……..

   (a) weak base (b) Metallic zinc (c) Na salt of acid (d) pyridine

Q. 2. Answer the following in one sentence.

1. Why nucleophillic attack occurs on carbonyl carbon?
2. What is hybridization of carbonyl carbon?
3. Why formaldehyde and benzaldehyde does not undergo aldol condensation?
4. Which base is used in perkin's reaction?
5. What is Cannizzaro's reaction?
6. Which reaction is useful for synthesis of alpha-beta unsaturated compound?
7. Which catalyst is used in Reformatsky reaction?

Q. 3. Long answer type questions.

1. What is nucleophilic addition reaction? Explain mechanism of nucleophilic addition to carbonyl compounds.
2. Explain in in detains Reformatsky reaction and give its applications.
3. Describe the structure and reactivity of carbonyl group.

4. How will you prepare cinnamic acid with the help of Perkin reaction and Knovenagel condensation reaction.

Q.4. Short answer question.

1. Explain Perkin reaction giving its mechanism and application.
2. Explain Knoevenagel condensation with mechanism.
3. Write a note on Aldol condensation?
4. Write a note on Cannizzaro's reaction?
5. Give an account ofReformatsky reaction?
6. Write a note on Perkins reaction?

Unit 5: Stereochemistry

Q.1 Select the most correct alternatives from among those given below.

1. The potential energy of cyclohexane is maximum in ……. conformation.

(a) boat (b) twist boat (c) chair (b) half chair

2. According to Baeyerdistortion in bond angle of nuclear carbon in cyclic compounds introduces ……. Strain in molecule.

(a) torsional (b) van der Wall (c) angle (b) dipole-dipole

3. According to Baeyer, all cycloalkanes are …… in nature.

(a) planar (b) puckered (c) linear (b) cyclic

4. The valence angle in cyclopropane is ……

(a) 90^0 (b) 60^0 (c) 108^0 (b) 120^0

5. Strainless rings are ……..

(a) planar (b) puckered (c) linear (b) none of these

6. Torsional strain is minimum in ……..conformation of cyclohexane.

(a) boat (b) twist boat (c) chair (b) half chair

7. In chair conformation of cyclohexane all C – H bonds are in ……position.

(a) eclipsed (b) staggered (c) skew (b) overlapping

8. Conformational isomers are also known as ……

(a) conformers (b) rotational isomers (c) rotomers (b) all of these

Q.2. Answer the following in one sentence.

1. Define conformational isomerism.
2. Which conformers are called as extreme conformers?
3. Which conformers are possible in cyclohexane?
4. Among axial and equatorial methyl-cyclohexane which conformer is more stable?
5. Which theory is proposed by Sachse and Mohr?
6. What is ring flipping?

Q. 3. Long answer type questions.

1. With the help of potential energy diagram explain the stability of conformers of n-butane.
2. Discuss the relative stabilities of cyclohexane conformers with potential energy curve.

3. Comment on conformational analysis of ethane.

4. Explain the Baeyer's strain theory? What are its limitations?

5. What is ring flipping? Comment on the stabilities of conformers of cyclohexanol formeddue to ring flipping?

6. Explain the conformational analysis of monosubstituted cyclohexane w.r.t. suitable examples.

Q.4. Short answer question.

1. Which conformation of cyclohexane is more stable?
2. Explain 1:3 diaxial interactions with suitable examples.
3. Write note on locking of conformation.
4. Write note on theory of strainless ring.
5. Draw the Newman projections of n-butane conformations.