Code No: R050210802 **Set No. 1**

**II B.Tech I Semester Regular Examinations, November 2006**
**ORGANIC CHEMISTRY**
**(Chemical Engineering)**

**Time: 3 hours** **Max Marks: 80**

**Answer any FIVE Questions**
**All Questions carry equal marks**

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1. (a) Explain the differences between resonance and hyperconjugation effects.
   (b) Differentiate the inductive and electromeric effects. [8+8]
2. State and explain the mechanism of the following reactions:-
   (a) Fridel-Crafts acylation.
   (b) Reimer-Tiemann reaction. [8+8]
3. (a) Discuss the reaction mechanism and applications of Aldol condensation.
   (b) What happens when benzaldehyde is refluxed with acetic anhydride in the presence of potassium acetate? [8+8]
4. (a) What is a free-radical?
   (b) How do you get bromine free radicals?
   (c) Describe the free-radical mediated addition of HBr to alkenes. [4+8+4]
5. (a) Assign R and S configurations to the enantiomers of glyceraldehyde with the help of sequence rules.
   (b) Write a note on sequence rules for R.S notation. [6+10]
6. Write about the structure, preparation, properties and uses of
   (a) Bakelite
   (b) Nylons. [8+8]
7. (a) Explain why furan is less aromatic then pyrrole.
   (b) Compare the basicity of pyridine and pyrrole. How does pyrrole respond to electrophilic substitution reactions? [6+10]
8. How are the following conversions effected?
   (a) Tetrozotised benzidine to Congo red.
   (b) Benzaldehyde to Malachite Green. [8+8]

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Code No: R050210802 **Set No. 2**

**II B.Tech I Semester Regular Examinations, November 2006**
**ORGANIC CHEMISTRY**
**(Chemical Engineering)**

**Time: 3 hours** **Max Marks: 80**

**Answer any FIVE Questions**
**All Questions carry equal marks**

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1. Explain the influence of inductive effect on
   (a) bond lengths
   (b) reactivity of alkyl halides towards substitutions.
   (c) strength of carboxylic acid when electron with drawing groups are attached to $\alpha$-carbons. [5+5+6]

2. Write the sequence of reactions for the following conversions. As show in figures 2 & 2. [16]

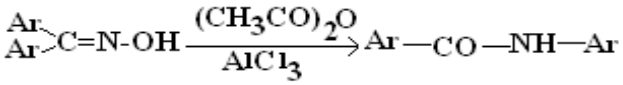


Figure 2

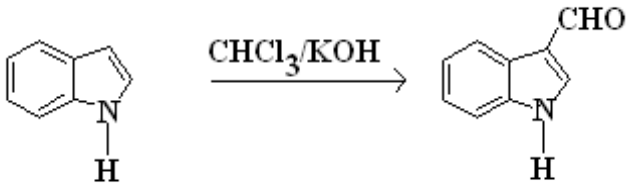


Figure 2

3. Formulate the following reactions with the mechanism involved in the product formation:-
   (a) $C_6H_5CHO + CH_3CHOO\underrightarrow{H^{\ominus}}$ Pr$oduct$
   (b) $C_6H_5CHO \frac{Acetic anhydride}{Sodium acetate}$ Pr$oduct$ [8+8]

4. Formulate and give mechanism for the following reactions:-
   (a) NBS and isobutylene.
   (b) Diborane and isobutylene followed by treatment with $H_2O_2$. [8+8]

5. (a) How maleic acid and fumaric acid react with acetyl chloride? What inference you get from this reaction?
   (b) Write a note on E and Z configurations of geometrical isomers. [8+8]

6. (a) What are high polymers? How are they classified - explain with examples.
   (b) With the help of a block diagram, discuss the manufacture of polyethylene terephthalate. [8+8]

7. (a) Furan acts as the least aromatic compound when compared with pyrrole and thiophene. Explain.
   (b) Explain how pyridine undergoes very facile substitution reactions. [8+8]

8. How are the following conversions effected?
   (a) Tetrozotised benzidine to Congo red.
   (b) Benzaldehyde to Malachite Green. [8+8]

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Code No: R050210802 **Set No. 3**

**II B.Tech I Semester Regular Examinations, November 2006**
**ORGANIC CHEMISTRY**
**(Chemical Engineering)**

**Time: 3 hours** **Max Marks: 80**

**Answer any FIVE Questions**
**All Questions carry equal marks**

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1. (a) Mention the role of resonance on increasing or decreasing the strength of acids and bases.
   (b) Explain how inductive effect influences the basic strength of amines. [8+8]

2. Formulate and give the mechanism for the following transformations
   (a) $Benzene + \underset{(excess)}{Alkyl\ halide} \xrightarrow{AICI_3} Dialkyl\,benzenes$
   (b) $Phenol \xrightarrow{CHCI_3/KOH/\Delta} salicylalic\,acid$ [8+8]

3. (a) Write the various steps involved in the reaction of butyraldehyde in the presence of 10% KOH.
   (b) Mention the different steps involved in the treatment of salicyaldehyde with acetic anhydride in the presence of sodium acetate. [8+8]

4. (a) What are free-radicals ? How are they formed?
   (b) Describe the free-radical type halogenation of alkanes. [10+6]

5. (a) Discus the methods of resolution of racemic mixtures.
   (b) What is the criterion of enantiomerism? [10+6]

6. (a) Explain the difference between natural rubber and gutta percha.
   (b) Write briefly on:
      i. Wool and
      ii. Silk. [8+8]

7. (a) Give any two methods for the preparation of the following:
      i. Pyrole
      ii. Pyridine.
   (b) How will you explain the grater basicity of pyridine as compared to that of pyrrole? [4+4+8]

8. (a) What are dyes and how are they prepared? Give any two examples.
   (b) Describe the important uses of azo dyes. [8+8]

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Code No: R050210802 **Set No. 4**

**II B.Tech I Semester Regular Examinations, November 2006**
**ORGANIC CHEMISTRY**
**(Chemical Engineering)**

**Time: 3 hours** **Max Marks: 80**

**Answer any FIVE Questions**
**All Questions carry equal marks**

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1. (a) Define inductive effect and discuss various characteristics of inductive effect.
   (b) How inductive effect plays a role on dipole moment, bond length of a molecule. [8+8]

2. Write the sequence of steps involved in the following conversions.As show in figures 2 & 2. [16]

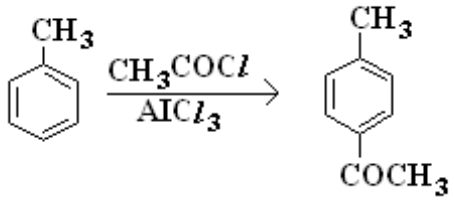


Figure 2

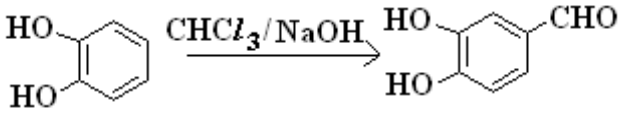


Figure 2

3. (a) Discuss the steps involved in the formation of cinnamic acid from benzaldehyde and acetic anhydride in the presence of anhydrous sodium acetate.
   (b) Explain the mechanism in the formation of acetaldol from acetaldehyde.[8+8]

4. (a) What are free-radicals ? How are they formed?
   (b) Describe the free-radical type halogenation of alkanes. [10+6]

5. How will you assign E-Z notations to geometrical isomers? Explain with suitable examples. [16]

6. (a) Describe the structure of natural rubber.
   (b) Explain the difference between natural and synthetic rubber.
   (c) What are the commercial forms of natural rubber and how are they obtained. [5+5+6]

7. (a) Outline any two methods for the preparation of thiophenes.
   (b) What happens when quinoline is treated with?
      i. Sodamide in liq.ammoinia.
      ii. Fuming nitric acid in the presence of fuming sulphuric acid.
      iii. Alkaline $KmnO_4$ [6+4+3+3]

8. (a) What are dyes?
   (b) Explain the classification of dyes based on their chemical structure. [6+10]

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