

Code No: R09220803

**R09****Set No. 2**

II B.Tech II Semester Examinations, APRIL 2011

**ORGANIC CHEMISTRY**Common to Chemical Engineering, Electronics And Telematics, Electronics  
And Communication Engineering

Time: 3 hours

Max Marks: 75

Answer any FIVE Questions  
All Questions carry equal marks

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- Write mechanism for generation of bromine free radical from HBr using dibenzoyl peroxide.
  - What happens when 2-pentene is treated with NBS in  $CHCl_3$  solution under reflux? [7+8]
- What are the important reactions undergone by pyridines?
  - State and formulate the following synthesis for quinolines : -
    - Combe's method
    - Friedlander's method. [8+7]
- Which of the following compounds has greater polarity difference & explain why?
    - $CH_3I$
    - $CH_3Br$
    - $CH_3F$
    - $CH_3Cl$
  - Draw the resonance structures of benzyl carbonium ion and explain their stability? [7+8]
- Differentiate between plastics, rubbers and fibers giving examples.
  - Outline the preparation of raw rubber from Latex.
  - Explain the process of vulcanization. [7+4+4]
- Explain the concept of "free-rotation" across C-C bond with the help of an example.
  - What is "Specific Rotation" and how it is measured? [7+8]
- Discuss the electronic absorption spectrum of dyes.
  - Explain chromophore and auxochrome with examples. [7+8]
- Explain why Reimer-Tiemann reaction does not occur with ethoxy benzene?
  - Describe the preparation of butyrophenone from benzene. [7+8]
- Describe the reaction between acetophenone and propanaldehyde in the presence of aq. ethanolic KOH.

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- (b) Describe a laboratory method for the preparation of  $\beta$ -phenylacrylic acid using Perkin condensation reaction. [7+8]

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1. (a) State and explain Perkin reaction?  
(b) Discuss the scope and limitations of this reaction. [4+11]
2. (a) Discuss the Reimer-Tiemann reaction giving the scope of this reaction.  
(b) Describe, giving mechanism, the reaction between benzene and benzoyl chloride in the presence of anhydrous  $AlCl_3$  in refluxing 1,2-dichloroethane. [7+8]
3. (a) Write the order of acidity in the descending order and explain the order for the following:  
i. Benzoic acid; p-Nitrobenzoic acid; p-methoxybenzoic acid.  
(b) Comment on the stability of Kekule structures and Charge separated structures in benzene and explain their importance. [7+8]
4. (a) How is PVC manufactured? What are its important properties?  
(b) How is PVC plasticized to obtain a non-brittle polymer?  
(c) Outline the important applications of PVC. [6+5+4]
5. (a) Differentiate between "conformation" and "configuration" of an organic compound using examples.  
(b) Draw the chair, boat and twist boat forms of Cyclohexane and comment on their stability. [7+8]
6. Discuss the synthesis and applications of the following :-  
(a) Bismark Brown - Y  
(b) Congo-Red. [8+7]
7. (a) Write the structures of the following compounds indicating the correct numbering of the ring system:-  
i. 3-Hydroxypyridine  
ii. Pyrrole - 3- aldehyde  
iii. 4-Nitroquinoline - N-Oxide  
iv. 1-Cyanoisoquinoline.  
(b) Draw the resonance structures of isoquinoline and explain its reactivity. [7+8]

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8. (a) Discuss the reaction between n-pentane and chlorine in the presence of UV light.
- (b) Describe the reaction between HCl and cyclohexene. [7+8]

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1. (a) What is a nucleophile? How it is different from a basic anionic species?  
(b) Discuss the reaction between acetone and propanaldehyde in the presence of aq. KOH. [4+11]
2. (a) What do you mean by No bond Resonance? Explain its importance.  
(b) Explain why benzyl carbonium ion is more stable than ethyl carbonium ion? [7+8]
3. (a) Describe the reaction of benzyl chloride with benzene in the presence of anhydrous  $AlCl_3$  in refluxing dichloromethane solution?  
(b) How was it proved that the groups which migrate in Beckmann rearrangement reaction are those that are anti to each other. [7+8]
4. (a) Explain the difference between the following grades of polyethylene: -  
i. LDPE  
ii. HDPE  
iii. LLDPE.  
(b) How are these grades of polythenes made? What are their properties and applications? [6+9]
5. (a) Draw the structures of pyrrole, pyridine, quinoline and isoquinoline ring systems and provide correct numbering for these ring systems.  
(b) Explain why pyrrole is a weaker base than aniline? [7+8]
6. (a) What are "conformers"? Explain why conformers are regarded as readily interconvertible isomers at room temperature?  
(b) What are sequence rules? Explain them taking the example of lactic acid. [7+8]
7. (a) Predict the product obtained when 1-hexene is treated with NBS using  $CCl_4$  as solvent.  
(b) What happens when the reaction of 2-pentene is carried out with HBr in the presence of diphenyl peroxide? [7+8]

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8. (a) p-methylbenzaldehyde is condensed with 2moles of N,N-dimethylaniline in the presence of  $\text{Con.H}_2\text{SO}_4$  to obtain a condensation product which on oxidation with  $\text{PbO}_2$  in acetic acid followed by treatment with con.  $\text{HCl}$  gave a brilliantly coloured product. Formulate the reactions and give the structure of the coloured product.
- (b) If a compound shows no absorption in the region 400-800 nm, can it show any absorption in the UV-region. [11+4]

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1. (a) Write the structure of Rosaniline hydrochloride.  
(b) Outline a method for its preparation.  
(c) What are the important uses of Congo-Red? [4+7+4]
2. (a) Describe any two methods for radical generation.  
(b) Give one example for neutral radical, cation radical and anion radical.  
(c) Describe the thermal halogenation of ethane. [6+5+4]
3. (a) What are initiators? How are they useful in bringing about addition polymerisation reactions?  
(b) Write a note on condensation polymerisation giving examples. [7+8]
4. (a) Discuss the reaction between two moles of n-butyraldehyde in aq.KOH at RT.  
(b) What happens when p-bromobenzaldehyde is heated with KCN in aq.ethanolic solution? [7+8]
5. (a) Draw the orbital picture of benzene. Explain its stability by using resonance phenomenon.  
(b) Indicate which of the following compounds has more number of resonance structures and what are they?  
i. Ethylbenzene; Styrene [7+8]
6. (a) Explain the role and necessity of Lewis acids in Friedel-Crafts reactions.  
(b) Arrange the following compounds in the order of their reactivity in Reimer-Teimann reaction : -  
i. p-Nitrophenol  
ii. Phenol  
iii. p-Methylphenol. [7+8]
7. (a) Indicate which of the following compounds can exhibit geometrical isomerism and give justification for your answer :-  
i. 1-Propene  
ii. Acetaldehyde  
iii. Acetophenone

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- iv. 2-Butene.
- (b) Indicate which of the following compounds can exhibit optical isomerism and give justification for your answer : -
- i.  $\alpha$ -Chloroacetic acid
  - ii. Benzyl chloride
  - iii. Propionic acid
  - iv. 2-Chlorobutanoic acid. [8+7]
8. (a) Compare the aromaticities of furan, pyrrole and thiophene.
- (b) Describe the Pictet - Spengler synthesis of isoquinolines. [11+4]

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