

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

1. (a) Write mechanism for generation of bromine free radical from HBr using dibenzoyl peroxide.
(b) What happens when 2-pentene is treated with NBS in $CHCl_3$ solution under reflux? [7+8]
2. (a) What are the important reactions undergone by pyridines?
(b) State and formulate the following synthesis for quinolines : -
i. Combe's method
ii. Friedlander's method. [8+7]
3. (a) Which of the following compounds has greater polarity difference & explain why?
i. CH_3I
ii. CH_3Br
iii. CH_3F
iv. CH_3Cl
(b) Draw the resonance structures of benzyl carbonium ion and explain their stability? [7+8]
4. (a) Differentiate between plastics, rubbers and fibers giving examples.
(b) Outline the preparation of raw rubber from Latex.
(c) Explain the process of vulcanization. [7+4+4]
5. (a) Explain the concept of "free-rotation" across C-C bond with the help of an example.
(b) What is "Specific Rotation" and how it is measured? [7+8]
6. (a) Discuss the electronic absorption spectrum of dyes.
(b) Explain chromophore and auxochrome with examples. [7+8]
7. (a) Explain why Reimer-Tiemann reaction does not occur with ethoxy benzene?
(b) Describe the preparation of butyrophenone from benzene. [7+8]
8. (a) 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 β -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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Answer any FIVE Questions
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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 Con. H_2SO_4 to obtain a condensation product which on oxidation with PbO_2 in acetic acid followed by treatment with con. 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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Answer any FIVE Questions
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- Write the structure of Rosaniline hydrochloride.
 - Outline a method for its preparation.
 - What are the important uses of Congo-Red? [4+7+4]
- Describe any two methods for radical generation.
 - Give one example for neutral radical, cation radical and anion radical.
 - Describe the thermal halogenation of ethane. [6+5+4]
- What are initiators? How are they useful in bringing about addition polymerisation reactions?
 - Write a note on condensation polymerisation giving examples. [7+8]
- Discuss the reaction between two moles of n-butyraldehyde in aq.KOH at RT.
 - What happens when p-bromobenzaldehyde is heated with KCN in aq.ethanolic solution? [7+8]
- Draw the orbital picture of benzene. Explain its stability by using resonance phenomenon.
 - Indicate which of the following compounds has more number of resonance structures and what are they?
 - Ethylbenzene; Styrene [7+8]
- Explain the role and necessity of Lewis acids in Friedel-Crafts reactions.
 - Arrange the following compounds in the order of their reactivity in Reimer-Teimann reaction : -
 - p-Nitrophenol
 - Phenol
 - p-Methylphenol. [7+8]
- Indicate which of the following compounds can exhibit geometrical isomerism and give justification for your answer :-
 - 1-Propene
 - Acetaldehyde
 - 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. α -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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