Code No: 07A4BS03 **R07** **Set No. 2**

II B.Tech II Semester Examinations,December 2010
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 difference between "enantiomers" and "diastereomers" giving examples.
   (b) Write notes on elements of symmetry found in organic compounds. [8+8]
2. (a) Write the electrophile formed in the reaction of ethyl chloride with $AlCl_3$. Describe the reaction of this electrophile with toluene in dichloromethane solution under refluxing conditions.
   (b) Discuss the reaction of p-chlorophenol with chloroform in ethanolic KOH under heating conditions. [8+8]
3. Formulate the reaction and give mechanism for the following:
   (a) Addition of HBr to 1-hexene using benzoyl peroxide.
   (b) Reaction of isopropylbenzene with Cl_2 gas in the presence of electro-magnetic radiation of wavelength 250 nm. [8+8]
4. (a) If a compound does not show absorption in the UV region of electromagnetic spectrum, can it exhibit the property of colour?
   (b) Draw the resonance structures of Bismark - Brown - R. [4+12]
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? [8+8]
6. (a) Formulate the reaction between p-chlorobenzaldehyde and acetaldehyde in the presence of aq.ethanolic KOH at RT.
   (b) Discuss the reaction between m-nitrobenzaldehyde with KCN in aq.ethanolic solution. [8+8]
7. Discuss the preparation, properties and uses of:
   (a) Terylene and
   (b) Neoprene. [8+8]
8. (a) Differentiate between electromeric effect and resonance effect using examples.
   (b) Explain why acetic acid is a stronger acid than ethanol. [8+8]

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Code No: 07A4BS03 **R07** **Set No. 4**

II B.Tech II Semester Examinations,December 2010
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) What happens when p-methylphenol is heated with chloroform in aq.ethanolic KOH.? Formulate the reaction and give its mechanism.
   (b) Discusss the reaction between benzene and ethyl iodide in the presence of anhydrous $AlCl_3$ in refluxing dichloromethane solution. [8+8]
2. (a) Between methyl fluoride and methyl iodide which one has greater polarisability effect ? Which one will undergo nucleophilic substitution at a faster rate and why ?
   (b) For bases such as ammonia, trimethyl amine, dimethyl amine & methyl amine which one is more basic? Write the order of basicity in the ascending order and explain the order. [8+8]
3. (a) What are the different types of polyethylenes manufactured? Explain their differences & properties.
   (b) Describe the properties, preparation and applications of polyurethane resins. [8+8]
4. (a) What happens when m-chlorobenzaldehyde reacts with KCN in ethanolic solution?
   (b) Describe the reaction between m-ethylbenzaldehyde and acetic anhydride in the presence of anhydrous sodium acetate under heating conditions. [8+8]
5. What will be the major product(s) for the following reactions:
   (a) Addition of hydrogen chloride to 1-butene in CCl_4 ?
   (b) Addition of HBr to 1-hexene in the presence of di (p-methoxybenzoyl) peroxide. [8+8]
6. (a) Discuss any three reactions of furan in which it acts as a π-excessive system.
   (b) Using simple qualitative experiments in the laboratory, how can you differentiate between:
      i. Thiophene and benzene
      ii. Pyrrole and pyridine. [8+8]
7. (a) Draw the Fisher Projection forms of α-chloropropionic acid and label them as R or S.
   (b) Draw the geometrical isomeric forms of 2-pentene and label them as E or Z.

(c) Using a potential energy diagram, comment on the stability of different conformational forms of Cyclohexane. [4+4+8]

8. (a) What happens when fluorescein is treated with aq. NaOH at room temperature? Explain your answer using resonance structures.

(b) A compound is transparent in the region 200-400 nm. Can it be used as a dye? [12+4]

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Code No: 07A4BS03 **R07** **Set No. 1**

II B.Tech II Semester Examinations,December 2010
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) Describe a synthesis of 4-amino-naphthalenesulphonic acid sodium salt.
   (b) How can this compound be transformed into Congo-red? [8+8]
2. (a) Explain the difference between inductive effect and electromeric effect ?
   (b) Between methyl chloride and methyl iodide which is more reactive towards nucleophiles and explain why? [8+8]
3. (a) Formulate the reaction between ethyl methyl ketone and acetaldehyde in the presence of sodium methoxide in methanol.
   (b) Describe the reaction of benzaldehyde with NaCN in aq.ethanol? [8+8]
4. (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. [8+8]
5. Give mechanisms for the following conversions:
   (a) Propylene into n-propyl bromide in the presence of HBr using benzoyl peroxide.
   (b) Ethane into ethyl iodide in the presence of iodine vapour at 100 ^oC. [8+8]
6. (a) Explain how would you prepare pure ethylbenzene from benzene and acetyl chloride using Friedel-Crafts reaction?
   (b) What happens when phenol is refluxed with chloroform in the presence of potassium t-butoxide in t-butanol? Formulate the reaction and mechanism for product formation. [8+8]
7. (a) How is vinyl chloride manufactured?
   (b) Describe its conversion to PVC of commercially useful grade?
   (c) What are the chief uses of PVC? [4+6+6]
8. Outline the structures of the following products and formulate the reactions :-
   (a) 2-Methylquinoline from aniline
   (b) 2,5-Dimethylfuran from 2,5-hexanedione
   (c) 1-Phenylisoquinoline from benzyl chloride

(d) 4-Aminopyridine from pyridine - N- Oxide. [4+2+6+4]

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Code No: 07A4BS03 **R07** **Set No. 3**

II B.Tech II Semester Examinations,December 2010
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) Describe the reaction between formaldehyde and acetophenone in the presence of aq.methanolic NaOH.
   (b) Formulate the reaction between p-chlorobenzaldehyde and acetic anhydride under reflux in the presence of anhydrous sodium acetate. [8+8]
2. (a) Explain why aniline is a weaker base than cyclohexylamine?
   (b) Draw the resonance structures of p-methoxybenzyl cation and explain their stability. [8+8]
3. (a) Write the correct structure of the following heterocyclic compounds and give their systematic names : -
      i. Furoic acid
      ii. Piperidine
      iii. Furfuraldehyde
      iv. Quinaldine.
   (b) Describe the electrophilic aromatic substitution and nucleophilic aromatic substitutution reactions undergone by quinolines. [8+8]
4. (a) Explain the role and necessity of Lewis acids in Friedel-Crafts reactions.
   (b) Arranage the following compounds in the order of their reactivity in Reimer-Teimann reaction : -
      i. p-Nitrophenol
      ii. Phenol
      iii. p-Methylphenol. [8+8]
5. Predict the products for the following reactions:
   (a) Hydrogen bromide addition to 1-pentene in the presence of diacetyl peroxide.
   (b) Addition of hydrogen chloride to 1-heptene. [8+8]
6. (a) Explain the difference between monomers and synthetic high polymers.
   (b) Discus the compounding of plastics and natural rubber as engineering materials. [4+12]
7. (a) Benzidine was diazotized with aq. $NaNO_2$ in HCl medium at 0^0C to obtain a bis-diazo salt which was coupled with p-aminobenzene sulphonic acid yielding a brightly coloured product. Formulate the reactions and write the structure of the product giving mechanism.

(b) A compound shows no absorption in the region 400-800 nm. Can it be used as a dye? [12+4]

8. (a) What is meant by "Superimposability of a mirror-image" for an organic molecule?

(b) Give any two examples of molecules having a chiral centers, but possessing a "center of symmetry".

(c) Benzaldehyde (C_6H_5CHO) on reaction with MeMgI in anhydrous ether followed by hydrolysis give a products both having a molecular formula of $C_8H_{10}O$. Formulate the reaction sequence & indicate whether the final products will be optically active or not? [4+2+10]

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