

II B.Tech. I Semester Regular Examinations, November -2005**ORGANIC CHEMISTRY****(Chemical Engineering)****Time: 3 hours****Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. (a) How to explain acidic properties of dicarboxylic acid using Inductive effect.
(b) Explain the following applications of Inductive effect.
 - i. Basic characteristics of amines
 - ii. Formation of esters. [8+8]
2. Show the reaction mechanism of aldol condensation and describe its uses. [16]
3. (a) What are free-radicals ? How are they formed?
(b) Describe the free-radical type halogenation of alkanes. [10+6]
4. Explain the following
 - (a) Chiral center
 - (b) Plane polarised light
 - (c) Meso compound
 - (d) Conformational isomers [4×4]
5. (a) Which types of compounds exhibit geometrical isomerism? Give examples.
(b) Draw the structures of maleic acid and fumaric acid and assign configuration on the basis of E-Z rotation. [8+8]
6. Write about the structure, preparation, properties and uses of
 - (a) Bakelite
 - (b) Nylons. [8+8]
7. (a) How will you isolate pyrrole from bone oil? Indicate how it reacts with the following.
 - i. HI /P
 - ii. NH_2OH / C_2H_5OH
(b) Compare the oxidation reactions of quinoline and isoquinoline by alkaline $KMnO_4$. [8+8]
8. What makes an organic compound coloured? Give the method of preparation and uses of Malachite Green and Congo Red. [16]

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1. Discuss about polar effects briefly such as inductive, hyperconjugation and resonance effects. [16]
2. (a) Discuss about hydroboration with reaction mechanism.
(b) Describe the Perkin condensation. [8+8]
3. (a) Describe the acid catalyzed addition of water to propylene.
(b) Discuss the reaction between ethane gas and chlorine in the presence of UV light. [8+8]
4. (a) Discuss the methods of resolution of racemic mixtures.
(b) What is the criterion of enantiomerism? [10+6]
5. How will you assign E-Z notations to geometrical isomers? Explain with suitable examples. [16]
6. (a) What is Vulcanisation? Why is this done?
(b) Describe properties and uses of cellulose. [8+8]
7. (a) How will you isolate pyrrole from bone oil? Indicate how it reacts with the following.
 - i. HI /P
 - ii. NH_2OH / C_2H_5OH
(b) Compare the oxidation reactions of quinoline and isoquinoline by alkaline $KMnO_4$. [8+8]
8. Give an example for each of the following
 - (a) Mordant dye
 - (b) an azo dye
 - (c) Vat dye
 - (d) Triphenyl amine dye

Give the synthesis of any two of them? [16]

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1. (a) Define and explain Inductive effect.
(b) Explain why aniline is less basic in comparison with methyl amine. [10+6]
2. Write a detailed note on Perkin reaction with mechanism. [16]
3. (a) Describe the chlorination of methane in the presence of peroxides.
(b) Discuss the chlorination of ethane in the presence of heat. [8+8]
4. Explain the following
(a) Chiral center
(b) Plane polarised light
(c) Meso compound
(d) Conformational isomers [4×4]
5. Write a note on conformational analysis of cyclohexane. [16]
6. (a) How are polymers classified based on
 - i. tacticity
 - ii. branching of chains and
 - iii. nature of monomers.
(b) Outline the preparation, properties and uses of PVC. [12+4]
7. (a) How will you prepare the following compounds.
 - i. Pyrrole
 - ii. Quinoline
(b) Compare Electrophilic substitution reactions in Pyrrole and Pyridine. Justify your comparison with suitable explanation. [8+8]
8. (a) What are dyes?
(b) Explain the classification of dye based on their chemical structure. [6+10]

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1. (a) Explain the following applications of Inductive effect
 - i. Effect of bond lengths
 - ii. Dipole moment
 - iii. reactivity of alkyl halide(b) Discuss the strength of carboxylic acid based upon Inductive effect. [9+7]
2. Write a detailed note on Perkin reaction with mechanism. [16]
3. (a) What are peroxides ? How are they prepared?
(b) How are peroxides useful in generating radicals?
(c) Describe the halogenation of alkanes using free-radicals. [6+5+5]
4. Write short note on optical isomerism and explain it with reference to tartaric Acid. How does it give two optically active forms? [16]
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 is natural wool? How is it obtained?
(b) Explain the difference between natural and artificial silk. How are they distinguished? [8+8]
7. (a) What are Heterocyclic compounds? How are they classified?
 - i. Furan is treated with SO_3 in pyridine.
 - ii. Pyridine is treated with sodamide.
 - iii. Quinoline is treated with alkaline $KMnO_4$.(b) Give the above answers with suitable chemical equations. [4+12]
8. What makes an organic compound coloured? Give the method of preparation and uses of Malachite Green and Congo Red. [16]
