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# INTERNATIONAL CENTRE FOR APPLIED SCIENCES

(Manipal University)

## IV SEMESTER B.S. DEGREE EXAMINATION – APRIL / MAY 2017

**SUBJECT: BIOORGANIC CHEMISTRY (CH 243)**

**(BRANCH: IND. BIOTECH.)**

**Tuesday, 2 May 2017**

**Time: 3 Hours** **Max. Marks: 100**

- ✓ **Answer ANY FIVE full questions.**
- ✓ **Draw a neat labeled diagram and equations wherever necessary.**

**1A.** Explain the following
(a) Baeyer strain theory
(b) Sache-Mohr theory
**1B.** Give an account of possible isomerism in lactic acid and tartaric acid.
**1C.** Comment on the relative stability of conformers of cyclohexanes.

**(8+8+4)**

**2A.** Explain four methods of preparation of aliphatic carboxylic acids.
**2B.** Explain four synthetic applications of acetoacetic ester.
**2C.** Describe the structure of carbonium ions and carbanions and their stability due to resonanace.

**(8+8+4)**

**3A.** Discuss primary, secondary, tertiary and quaternary structure of proteins.
**3B.** Discuss the classification of structural isomerism with suitable examples.
**3C.** Explain the methods of preparation of diazomethane.

**(8+8+4)**

**4A.** Comment on aromaticity. Give details of orientation in monosubstituted benzene.
**4B.** Describe the general electrophilic substitution reaction mechanism and explain the following:
(a) Halogenation
(b) Nitration
(c) Sulphonation
**4C.** Why benzene undergoes electrophilic substitution reactions whereas alkenes undergo addition reaction? Explain with examples.

**(8+8+4)**

**5A.** Explain the chemical properties of amino acids.

**5B.** Discuss in detail the four color tests shown by proteins.

**5C.** Explain the following:

i) Strecker synthesis ii) Koop synthesis

**(8+8+4)**

**6A.** Discuss the molecular orbital structure of pyrrole and pyridine.

**6B.** Write the chemical reactions with appropriate conditions to show how each of the transformations are carried out:

i Pyrrole→ 2-formylpyrrole

ii Pyridine → 3-nitropyridine

iii Pyrrole→ pyrrole-2- sulphonic acid

iv Quinoline → 1,2,3,4-Tetrahydroquinoline

**6C.** Discuss the carbobenzoxy method for the synthesis of dipeptide.

**(8+8+4)**

**7A.** Expain in detail homolytic and heterolytic fission.

**7B.** How tautomerism differs from resonance? Explain keto enol tautomerism in acetone, ethylacetoacetate and acetylacetone.

**7C.** Explain the following in relation to carboxylic acids:

i Foramation of acid halids

ii Amides

**(8+8+4)**

**8A.** Explain the chemical properties of phenol.

**8B.** Write an account of pKa and pKb.

**8C.** Give one method each for the preparation of primary and secondary amines.

**(8+8+4)**