INTERNATIONAL CENTRE FOR APPLIED SCIENCES
(Manipal University)
III SEMESTER B.S. DEGREE EXAMINATION – NOV. / DEC. 2016
SUBJECT: TECHNICAL CHEMISTRY - 1 (CH 232)
(BRANCH: CHEMICAL)
Friday, 25 November 2016

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

✓ **Answer ANY FIVE full Questions.**
✓ **Write diagrams, equations or examples wherever necessary.**

1A. Explain the following reactions with an example each.
- **i)** Paal Knorr Synthesis
- **ii)** Riemann Tiemann reaction
- **iii)** Diels Alder reaction

1B. Write the following compounds in the increasing order of their acidities by giving appropriate reasons.
- **i)** CH_3CH_2COOH, CH_3COOH, $HCOOH$
- **ii)** $ClCH_2CH_2CH_2COOH$, $CH_2CH_2ClCH_2COOH$, $CH_2CH_2CH_2ClCOOH$
- **iii)** Alcohol, phenol, p-nitro phenol

1C. Give reasons for the following:
- **i)** Benzene is colorless while azo-benzene is red
- **ii)** Bromo-acetic acid is weaker acid than Fluro-acetic acid

1D. How does Grignard reagent react with the following organic compounds?
- **i)** Aldehydes
- **ii)** Alkylnes

           (6+6+4+4=20 marks)

2A. With suitable example explain the mechanism of Friedal crafts alkylation and acylation.

2B. Explain the following conversion methods:
- **i)** Aldohexose to aldopentose
- **ii)** Ketose to Aldose

2C. What are amines? Write the classification of amines with examples.

2D. Write the structure of cellulose. Mention any two of its applications.

           (6+6+4+4=20 marks)

3A. Name the components of starch. Write and explain its structure.

3B. Account for the following:
- **i)** Denaturation of proteins
- **ii)** Zwitter ion formation

3C. What are amino acids? How are they classified? Give an example for each.

3D. Discuss the Otto-Witt's Chromophore-auxochrome theory of dyes with suitable example.

           (6+6+4+4=20 marks)

4A. What are enzymes? Discuss the classification of enzymes.
4B. Explain the Skraup synthesis of quinolone. Account for the electrophilic and nucleophilic substitution reactions of pyridine.
4C. Explain with suitable examples the effect of following factors on the acidity of the organic compounds.
   i) Hydrogen bond   **ii)** Resonance stabilization
4D. Discuss the theory of enzyme action.

(6+6+4+4=20 marks)

5A. Give an explanatory note on N-terminal and C-terminal residue analysis of peptide.
5B. Justify the following.
   i) Fehling's solution can oxidize fructose but not bromine water
   ii) Sucrose is a non-reducing sugar
   iii) Glucose does not react with $NaHSO_3$ though it has an aldehyde group.
5C. Explain the procedure to separate the mixture of primary, secondary and tertiary amines. Write the reactions involved in it.
5D. Discuss the method of formation of the following dyes:
   i) Malachite green   **ii)** Rosaniline

(6+6+4+4=20 marks)

6A. Write an explanatory note on following:
   i) Huckel's theory of Aromaticity
   ii) Fluorescent brightening agent
6B. Explain the following tests shown by proteins with an example each
   i) Biuret test   **ii)** Millon's test   **iii)** Ninhydrin test
6C. How is glucose converted to arabinose and fructose? Explain with reactions.
6D. Justify the following:
   i) Indole is more susceptible to undergo electrophilic substitution at C-3 position than C-2 position
   ii) Chorine is deactivating, yet it is ortho-para directing in electrophilic aromatic substitution.

(6+6+4+4=20 marks)

7A. Discuss the valance band theory and resonance theory of dyes.
7B. Discuss the structure of protein in details.
7C. Differentiate between the following:
   i)   Bathochromic shift and hyposochromic shift
   ii)   Enzyme and co-enzyme
7D. Write the mechanism for the nitration of furan.

(6+6+4+4=20 marks)

8A. Explain the manufacture of sucrose from sugar cane using sugar manufacture flowsheet.
8B. Elucidate the ring structure of benzene. Discuss two evidence in favor of ring structure of benzene.
8C. Explain the classification of carbohydrates with Examples.
8D. What is polarimetry? Describe the determination of specific rotation using polarimeter.

(6+6+4+4=20 marks)

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