Reg. No.										

MANIPAL UNIVERSITY

THIRD SEMESTER B.S. (ENGG.) DEGREE EXAMINATION – DECEMBER 2015

SUBJECT: TECHNICAL CHEMISTRY - I (CH 232)

(BRANCH: CHEMICAL)

Friday, December 11, 2015

Time: 10:00 – 13:00 Hrs. Max. Marks: 100

- **Answer any FIVE full questions.**
- **Write diagrams, equations or examples whenever necessary.**

1A. With suitable examples discuss the classification of dyes based on its application.

1B. Explain the effect of following factors on acidity of organic compound.

i) Solvent ii) Resonance stabilization iii) Inductive effect

iv) Hydrogen bonding

1C. i) What are Grignard reagents? Explain with a neat diagram, the laboratory preparation of Grignard reagent.

ii) Write the chemical reactions for the action of the following reagents on glucose and fructose.

a) Bromine water b) Conc.HNO_3 c) Hydroxyl amine d) HI

(4+8+8 = 20 marks)

2A. Explain Ninhydrin test and Xanthoprotic test shown by proteins.

2B. Justify the following:

i) Furan undergoes electrophilic substitution at position-2

ii) Sucrose is non-reducing sugar

iii) Salicylic Acid is stronger than the benzoic acid

iv) Pyridine is more basic than pyrrole but less basic than piperidine

2C. i) Explain the mechanism of mutarotation. How does it account for the ring structure of monosaccharide?

ii) Discuss the Terminal residue analysis of peptide.

(4+8+8 = 20 marks)

3A. Discuss in detail the structure of protein.

3B. What are dyes? Explain Valence bond theory and Otto-Witt's Chromophore-Auxochrome theory in detail to explain the structure of dye.

3C. What are disaccharides? Explain the manufacture of sucrose from sugar cane.

(4+8+8 = 20 marks)

4A. Account for the structure of Lactose and Maltose.

4B. With suitable example explain Sulphonation and Nitration of benzene.

4C. **Explain the following reactions:**

i) Strecker synthesis of glycine ii) Paal knorr synthesis of Furan

iii) Fischer Indole synthesis iv) Skraup synthesis of Quinoline

(4+8+8 = 20 marks)

5A. Write an explanatory note on Huckel's theory of aromaticity and compare the aromaticity of furan, pyrrole and benzene.

5B. Describe the structures of benzene.

5C. **Write explanatory note on:**

i) Denaturation of proteins ii) Speficity of enzymes iii) Ruff degradation

iv) Bathochromic effect and Hypsochromic effect

(4+8+8 = 20 marks)

6A. Explain the effect of activating and deactivating group on aromatic electrophilic substitution reaction by taking suitable examples.

6B. i) How does diazomethane react with following compounds?

a) Phenol b) Amine c) Acid chloride d) Sodium amalgam

ii) Give the synthetic route of following dyes:

a) Cango red b) Malachite green

6C. Give reason:

i) Methyl amine is stronger base than trimethylamine

ii) Indigo dye cannot be applied directly on fabrics

iii) Indole undergoes electrophilic substitution at β- position

iv) Unsaturated compounds more susceptible to undergo addition reaction than substitution

(4+8+8 = 20 marks)

7A. Explain the mechanism of following reactions:

i) Electrophilic substitution of thiophene

ii) Nucleophilic substitution of pyridine

7B. Explain the following:

i) Gabriel Phthalimide synthesis ii) Koop synthesis iii) Epimerisation

iv) Fischer Kilani Synthesis

7C. Discuss the following with an appropriate example:

i) Enzymes and Co-enzymes

ii) Classification of amino acids

iii) Diazo alkanes

iv) Isoelectric point and Zwitter ion

(4+8+8 = 20 marks)