Reg. No.										

MANIPAL UNIVERSITY

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

SUBJECT: TECHNICAL CHEMISTRY - II (CH 233)
(BRANCH: CHEMICAL)

Wednesday, December 16, 2015

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

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

1A. Give reasons for the following:
   i) Crystalline polymer have greater rigidity, higher and sharper softening point than amorphous polymers.
   ii) Animal fats are solid while vegetable oils liquid.

1B. How are the following prepared?
   i) SBR ii) Cellulose acetate iii) Carboxy methyl cellulose

1C. Write an explanatory note on compounding of rubber.

1D. Explain the following giving advantages and disadvantages:
   i) Emulsion polymerization ii) Bulk polymerization

(2+6+4+8 = 20 marks)

2A. Write the main reactions that occur during reforming.

2B. Explain how the viscosity average molecular weight of a polymer is determined?

2C. Describe the manufacture of Vanaspati.

2D. Discuss the classification of petroleum. Explain how ethane and benzene are used to make other petrochemicals.

(2+6+4+8 = 20 marks)

3A. What are antibiotics? Write the structure and uses of chloramphenicol.

3B. i) Discuss the classification of synthetic detergents with suitable examples.
   ii) Derive the copolymerization equation.

3C. i) Give the cleaning action of soaps.
   ii) Explain the expeller method for extracting vegetable oils.

3D. i) Define iodine number of oil. How is it experimentally determined?
   ii) Distinguish between each of the following (any two points):
      a) Addition and condensation polymerization
      b) Thermosetting and thermoplastic polymers.

(2+6+4+8 = 20 marks)

4A. Calculate the number average and weight average molecular weight of a polymer sample in which 40% molecules have molecular mass of 25000, 20% have molecular mass of 30,000 and rest have molecular mass of 55,000.

4B. i) Explain how the structure of a polymer influences the following properties:
   a) Plastic deformation b) Elastic character
   ii) Explain the free radical mechanism for polymerization of styrene (CH_2=CHC_6H_5)

4C. i) Discuss the manufacture of soap by modern continuous process.
   ii) Give reasons for the following:
   a) Silicone rubber cannot be vulcanised using sulphur.
   b) PVC is a tougher and stronger polymer than polyethylene.

4D. Explain the characteristics and applications of
   i) Tetracycline ii) Streptomycin

(2+6+4+8 = 20 marks)

5A. Describe the method of preparation, properties and uses of rayon.

5B. Give the synthetic route for the following:
   i) Sodium lauryl sulphate
   ii) Sodium alkyl benzene sulphonate

5C. Give the synthesis of sulphanilamide. Explain the mechanism of action of sulpha drugs.

5D. What is glass transition temperature (T_g)? Explain the factors affecting it. Mention its significance.

(2+6+4+8 = 20 marks)

6A. Account for the following;
   i) Oleic acid is hydrogenated at a later stage than linoleic acid.
   ii) The manufacture of potassium soaps cannot be carried out by the boiling process.

6B. i) Account for the following:
   a) Catalyst requires regeneration in a catalytic cracking process.
   b) Plasticizers are added during compounding of rubber.
   ii) Discuss the following reactions as applied to oils and fats:
   a) Hydrogenolysis
   b) Hydrolytic rancidity

6C. Explain how ultracentrifugation method is used to determine the molecular weight of polymer.

6D. Define cracking. Give an example. Explain fluidised bed catalytic cracking process. Mention its advantages over fixed bed.

(2+6+4+8 = 20 marks)

7A. Write a note on the general characteristics of antimalarials.

7B. Describe the structure, manufacture and any two properties of
   i) Starch ii) Silicone rubber

7C. What is vulcanization? Explain with reaction the vulcanization process of SBR.

7D. i) Write note on the products of hydrolysis of nucleic acids.

ii) Define the terms:

a) Nucleosides

b) Nucleotides

iii) Write the structure of penicillin, explain its properties and uses.

(2+6+4+8 = 20 marks)