

II B.Tech. I Semester Regular Examinations, November -2005
APPLIED CHEMISTRY AND BIO-CHEMISTRY
(Bio-Medical Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Explain the terms: [8]
 - i. Specific Conductance and
 - ii. Equivalent conductance.(b) Describe an experimental method to determine the equivalent conductance of an electrolyte. [8]
2. (a) Describe the free-radial polymerization of ethylene to polyethylene.
(b) Discuss the compounding of crude rubber. [8+8]
3. (a) What is a lubricant? How are lubricants classified? Give Examples. [8+8]
(b) Give, with examples, the mechanism of
 - i. Hydrodynamic.
 - ii. Boundary lubrication.
4. (a) Define hardness of water and what are the common units of hardness? Give relationship between various units.
(b) Describe the principle and procedure involved in softening of hard water by zeolite method. What are the limitations, advantages and disadvantages of the process. [8+8]
5. (a) Define cell. How many types of cells are there? Name them.
(b) Draw a generalized cell and differences in all types of cells and describe the main functions of the organelles. [8+8]
6. (a) What are isoenzymes? Explain with suitable examples.
(b) Explain the allosteric effects in enzyme catalysed reactions. [8+8]
7. (a) Explain the terms alkaptonuria , phenylketonuria and albinism.
(b) Write short notes on transamination and decarboxylation reactions of aminoacids. [8+8]
8. (a) Explain Henderson-Hassenbach equation and its significance.
(b) What is chloride shift? [8+8]

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1. (a) Explain the construction of:
 - i. A hydrogen electrode.
 - ii. A calomel electrode.(b) Describe the Kohlrausch's law of independent migration of ions. [8+8]
2. (a) What is crepe rubber? How is it made?
(b) Explain the compounding and fabrication of rubber. [8+8]
3. Write notes on: [16]
 - (a) Acid and saponification values of lubricating oil,
 - (b) Oxidation stability,
 - (c) Synthetic lubricants.
4. (a) Define potable water. How the municipal supply of water is carried out?
(b) Explain scales and sludge formation and controls. [8+8]
5. (a) Differentiate between prokaryotic and eukaryotic cells with suitable examples.
(b) Explain the composition or cell walls of prokaryotic cells [8+8]
6. (a) Give classification of enzymes based on their action with suitable examples.
(b) Explain the extraction and purification of an enzyme from tissues. [8+8]
7. Why the Krebs's cycle is known as final common path way of metabolism? Explain. [16]
8. (a) Discuss in detail the chemical composition of urine under normal and disease condition.
(b) Highlight some of the important diseases diagnosed by urine analysis. [8+8]

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1. (a) What is Arrhenius theory of electrolyte dissociation?
(b) Describe the construction and mode of working of a Galvanic cell. [8+8]
2. (a) Describe the radical, anionic and cationic polymerization of ethylene to polyethylene.
(b) Write a note on Vulcanization of rubber. [8+8]
3. Write a brief essay on the treatment of sewage, involving both physical and chemical methods. [16]
4. (a) Describe boiler troubles. And how do you overcome them.
(b) Define softening. Explain the lime-soda method of softening. [8+8]
5. (a) Define cell. How many types of cells are there? Name them. Give suitable examples for each.
(b) Name the important organelles of the cell. Explain the centrifugal separation of cell organelles and main functions of the cell. [8+8]
6. (a) Define enzyme? How it functions?
(b) Explain the factors which influence the rate of enzymic reaction. [8+8]
7. (a) Describe Embden Myerhof pathway and its significance. [8]
(b) Write short notes on: [8]
 - i. Glycogenolysis
 - ii. Glycogenesis
8. (a) Illustrate the structure of hemoglobin.
(b) Describe biological functions and mechanism of hemoglobin. [8+8]

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1. (a) Discuss Kohlraush's law of ionic mobilities.
(b) What is meant by degree of dissociation? Derive the Ostwald's dilution law relating equilibrium constant with the degree of dissociation. [8+8]
2. (a) How is Vinyl Chloride manufactured commercially?
(b) Describe the preparation, properties and application of novolac resin? [8+8]
3. Write notes on: [8+8]
(a) Aerobic and anaerobic processes in connection with Sewage.
(b) Analysis of Sewage
4. (a) Define sludge and scales. Explain scales formation in boilers and what are their effects in boilers?
(b) How do you prevent scale formation in boilers? Explain. [8+8]
5. (a) What are the differences between plant and animal cells?
(b) Explain the differences in the chemical composition of their cell walls. [8+8]
6. (a) Define active site, inhibitory site and activating site with a typical enzymic reaction.
(b) Explain irreversible inhibition of an enzyme with a suitable example. [8+8]
7. Write short notes on: [8+8]
(a) Essential fatty acids and cholesterol.
(b) Lipoproteins and triglycerides.
8. (a) Enumerate the chemical composition of urine.
(b) Highlight the clinical significance of urine analysis in diseases. [8+8]
