

B.TECH DEGREE EXAMINATIONS: JUNE 2010

Second Semester

BIOTECHNOLOGY

CHY106: Chemistry for Bio-Technology

Time: Three Hours

Maximum Marks: 100

Answer ALL Questions:-

PART A (10 x 1 = 10 Marks)

1. Hydrogen bond is not formed in
A) Hydrogen fluoride B) Ammonia C) Methane D) Water
2. The molecule which does not exhibit dipole moment is
A) H₂O B) NH₃ C) CCl₄ D) CHCl₃
3. Which one of the following is optically active?
A) Chloroform B) Propionic acid C) α -hydroxypropionic acid D) Carbon tetrachloride
4. 10g of (d) lactic acid is mixed with 15 g of (l) lactic acid. The resultant solution will be
A) Dextro rotatory B) Leavo rotatory C) Recemic mixture D) Optically inactive
5. The exhausted zeolite is regenerated by percolating through it a solution of
A) Zinc chloride B) Sodium chloride C) Calcium Chloride D) Magnesium Chloride
6. Calgon is a trade name of
A) Sodium phosphate B) Calcium phosphate
C) Sodium hexametaphosphate D) Calcium Silicate
7. Bakelite is prepared by the condensation of
A) benzene and formaldehyde B) phenol and formaldehyde
C) phenol and acetaldehyde D) glycerol and phthalic acid
8. Which of the following are condensation polymers?
i) Nylone-6, 6 ii) Teflon iii) PVC iv) polyethylene terephthalate
A) i & iv B) i & ii C) i & iii D) ii & iii
9. The indicator used in the determination of amount of calcium in milk by EDTA method is
A) Phenolphthalein B) Eriochrome Black-T C) Fluorescein D) Starch
10. Chemical constituent of kidney stone is
A) sodium oxalate B) potassium oxalate C) calcium oxalate D) sodium acetate

PART B (10 x 2 = 20 Marks)

11. Differentiate covalent bond and co-ordinate covalent bonds with suitable example.

12. How many sp^3 , sp^2 and sp hybridized carbon atoms are present in $(CH_3)_2CH-CH=CH-C\equiv C-CH=CH_2$?
13. 1, 2-dichloroethylene shows two geometrical isomers A and B. The dipole moment of A and B are 0.01D and 1.89D respectively. Predict with reason which one among A and B is cis isomer.
14. What are enantiomers? Give example.
15. Differentiate scale and sludge. How are they formed?
16. Write the principle of colloidal conditioning of water.
17. Write the differences between thermo plastics and thermosetting plastics with suitable examples.
18. How is polyethylene terephthalate prepared? Write its applications.
19. Give an example for super absorbent polymer and write its uses.
20. Write the synthesis of fluorescein with chemical equation.

PART C (5 x 14 = 70 Marks)

21. a) (i) Define inter and intra hydrogen bonding and discuss their consequences. (7)
- (ii) Explain the term hybridization? Discuss its three types involving s and p orbitals. Mention the state of hybridization of the central atom of H_2O (7)
- (OR)
- b) (i) Write a short notes on van der Waals force and its importance. (7)
- (ii) What do you understand by the term ionic bond? Why do ionic compounds have high melting and boiling points? List the characteristic of ionic compounds. (7)
22. a) (i) Write a short notes on geometrical isomerism. (7)
- (ii) Discuss the principle and importance of asymmetric synthesis. (7)
- (OR)
- b) (i) Write short notes on optical isomerism. (7)
- (ii) Explain resolution of racemic mixture. (7)
23. a) (i) Discuss zeolite method of softening of water. (7)
- (ii) Explain the desalination of water by reverse osmosis. (7)

(OR)

- b) (i) With neat diagram explain deionization of water by ion exchange method. (7)
(ii) Explain the principle of various steps involved in effluent treatment. (7)
24. a) (i) Styrene is polymerized in presence of benzoyl peroxide. Explain the free radical mechanism involved. (7)
(ii) Explain the preparation and applications of Teflon and nylon-6, 6. (7)
- (OR)**
- b) (i) Discuss the coordination polymerization mechanism. (7)
(ii) Write short notes on a) Vulcanization of rubber b) Rubber blended plastics. (7)
25. a) (i) Detail the principle involved in the determination of the amount of calcium in the milk powder. (7)
(ii) Explain the extraction and identification of DNA from green peas. (7)
- (OR)**
- b) (i) Explain the estimation of iodine in iodized common salt. (7)
(ii) Discuss the estimation of phosphoric acid in soft drinks. (7)
