

I Semester B.Sc. Examination, November/December 2005  
(Semester Scheme)  
BIOCHEMISTRY - I

Time : 3 Hours

Max. Marks : 60

*Instruction : Answer any six questions from Part - A and any eight questions from Part - B.*

PART - A

Answer **any six** of the following :

(2×6=12)

1. Define Viscosity. Give its SI unit.
2. Define semipermeable membrane.
3. Distinguish between strong and weak electrolytes.
4. Write the electronic configuration of chromium and copper.
5. Name the conjugate bases of the following :
  - a)  $\text{CH}_3-\text{COOH}$
  - b)  $\text{H}_3\text{O}^+$
  - c)  $\text{NH}_3$
  - d)  $\text{H}_3\text{PO}_4$
6. What is an adsorption Isotherm ?
7. What is half life period ? Give its relation with decay constant.
8. What are biopolymers ? Give two examples.
9. Define lattice energy. How does it influence the stability of an ionic compound ?
10. Express:
  - a) 480 cm in metres
  - b) 18 gms/cc in  $\text{kgm}^{-3}$ .

PART - B

Answer **any eight** of the following :

(6×8=48)

1. a) What are the reasons for errors in quantitative analysis ?  
b) Define surface tension. Give its S.I. unit.

(4+2)

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2. a) Calculate the wavelength of an electron moving with a velocity of  $2.05 \times 10^7 \text{ ms}^{-1}$ .  
[Given : mass of an electron =  $9.1 \times 10^{-31} \text{ kg}$ .  
Plank's constant =  $6.63 \times 10^{-34} \text{ kgm}^2\text{s}^{-1}$ .]
- b) Derive an expression for the combined solution equation. (3+3)
3. a) What is ionisation potential ? Ionisation potential of ferric iron is greater than ferrous iron. Give reason.
- b) What are the advantages of conductometric titration ? (3+3)
4. a) Explain the mechanism of buffer action in the case of weak base and its salt of a strong acid.
- b) Mention two differences between nuclear fusion and nuclear fission. (4+2)
5. a) What is co-ordinate bond ? Explain the formation of co-ordinate bond in  $\text{NH}_4^+$ .
- b) Write Nernst's equation for a single electrode potential. (4+2)
6. a) Discuss the light scattering method for the determination of molecular weight of a polymer.
- b) Explain adsorption of gases by solids. (3+3)
7. a) Write the experimental procedure for the determination of viscosity of the given liquid using Ostwald's viscometer.
- b) What is artificial radioactivity ? Give its applications. (3+3)
8. a) A current of dry air was passed through a solution containing 4.5 g of a solute in 100 g of water and then through pure water. The loss in weight of solvent and solution bulbs were 0.006 g and 2.4 g respectively. Calculate the molecular mass of the solute.
- b) Give the difference between sigma and pi bond. (4+2)
9. a) Explain the principle and working of G.M. counter.
- b) What are amphoteric substances ? Give two examples. (4+2)
10. a) Explain :
- 1) Common ion effect.
  - 2) Solubility product.
- b) Explain the difference in the bond angle of methane and ammonia, although both are  $\text{sp}^3$  hybridised. (4+2)
11. a) Discuss the structure of water molecule on the basis of VSEPR theory.
- b) What is meant by isoelectric pH of an amino acid ? (4+2)