

Note:

1. All the questions are compulsory. Choice is internal.
2. Figures to the right indicate full marks.
3. All questions carry equal marks.
4. Draw flowcharts/diagrams wherever necessary.

Q.1.A) State True or False:

(04)

- (i) Buffers resist the change in pH.
- (ii) pI stands for isoelectric point.
- (iii) In buffers both components decrease and increase at same time.
- (iv) pI is not used in protein separation.

Q.1.B) Write short notes on: (Any three)

(09)

- (i) Formulas used for calculating pH and pOH.
- (ii) pK
- (iii) Titration curve of lysine
- (iv) pK_{a1} and pK_{a2}
- (v) Protein buffer system
- (vi) Neutral side chain

Q.1.C) Answer the following: (Any two)

(12)

- (i) Write a short note on Henderson –Hasselbalch equation.
- (ii) Explain the titration curve of glycine.
- (iii) Write a short note on any two buffer systems.
- (iv) Write a short note on following:
a) Buffers b) Buffering action c) Isoelectric point

Q.2.A) State True or False:

(04)

- (i) Colloids do not precipitate on addition of an electrolyte.
- (ii) Viscosity of the sucrose solution is less than water.
- (iii) Temperature affects osmosis.
- (iv) Colloidal solutions have higher surface area than suspension solutions.

Q.2.B) Answer the following: (Any three)

(09)

- (i) Explain significance of osmosis.
- (ii) Explain the tyndall effect with an example.
- (iii) What is Molarity and molality?
- (iv) Explain factors affecting surface tension
- (v) Explain renal dialysis
- (vi) What do you mean by volume percentage? What is the volume percentage if 25.5 grams of NaCl dissolved in 250 ml solution.

Q.2.C) Answer the following: (Any two)

(12)

- (i) Explain the mechanism of osmosis.
- (ii) Elaborate on properties of colloids.
- (iii) Describe Normality, also what is the normality of the following 1 L aqueous solution with 55 gram NaOH dissolved in it?

(iv) What is the difference between Molarity and Normality? Write any two uses of Normality

Q.3.A) State True or False:

(04)

- (i) Light can be focused by adjusting the condenser.
- (ii) Stereo microscopy provides a one-dimensional image.
- (iii) The magnifying power of the compound microscope is the product of the magnification of the objective lens and eyepiece.
- (iv) The use of single convex lenses or groups of lenses is found in fluorescent lamps.

Q.3.B) Write short notes on: (Any three)

(09)

- (i) Compound microscope.
- (ii) Scanning electron microscope.
- (iii) Principles of microscopy.
- (iv) Electron microscope.
- (v) Dark field microscope.
- (vi) Fluorescent microscope.

Q.3.C) Answer the following: (Any two)

(12)

- (i) What are the types of microscopes?
- (ii) What is differential interference contrast?
- (iii) What are the principles of microscopy?
- (iv) What is electron microscopy and its types?

Q.4.A) Define and explain: (Any five)

(10)

- (i) Acid
- (ii) Prism
- (iii) Specimen
- (iv) Magnification
- (v) Colloids
- (vi) Eyepiece
- (vii) Titration

Q.4.B) Write Short notes on: (Any three)

(15)

- (i) Explain in brief about Sorenson's titration.
- (ii) Write a short note on the titration curve of aspartate.
- (iii) Renal Dialysis
- (iv) Role of bile in digestion.
- (v) Light Microscope.
- (vi) Scanning electron Microscope.