

Seat No. : _____

DE-105

December-2021

B.Sc., Sem.-III

**201 : Biochemistry
(Biophysics and Instrumentation)**

Time : 2 Hours]

[Max. Marks : 50

- Instructions :**
- (1) All Questions in Section – I carry equal marks.
 - (2) Attempt any **THREE** questions in Section – I.
 - (3) Question – 9 in Section – II is **Compulsory**.
 - (4) Illustrate your answers with neat diagrams wherever necessary.

Section – I

Attempt any three :

1. (a) Define : (1) pOH (2) Pk_w (3) Base (4) pH (5) Ampholyte (6) Buffer capacity (7) Weak acids
(b) Discuss Buffer capacity with proper example. 7

2. (a) (i) Calculate the pH of a buffer with 20 ml 0.5 M sodium acetate and 20 ml 0.5 M acetic acid. What will be the pH of the buffer if 1 ml 0.5 M NaOH is added to this buffer. 5
(ii) Calculate the pH of a solution whose pOH is 10. 2
(b) (i) Discuss ionization of water. 5
(ii) Draw and label standard hydrogen electrode. 2

3. (a) Define Viscosity and give its units. How do we measure relative and absolute viscosity of a solution. 7
(b) Discuss physiological importance of surface tension. 7

4. (a) Explain the effect of Donan membrane equilibrium. 7
(b) Explain the physiological importance of Osmosis and osmotic pressure. 7

5. (a) What is the principle of TLC ? List any five applications of HPLC. 7
 (b) Write a brief note on Gas Chromatography. 7
6. (a) What is the principle of Electrophoresis? Discuss factors affecting Electrophoresis. 8
 (b) List advantages of PAGE 6
7. (a) Discuss the parts and working of a Colorimeter. 8
 (b) State the Lambert- Beer law. What is its limitations ? 6
8. (a) Draw, label and discuss parts of a Spectrofluorometer. Write any two applications of it. 8
 (b) Discuss the differences between Colorimeter and Spectrophotometer. 6

Section – II

9. Attempt any 8 : (All questions are of 1 mark each) 8
- (1) Name the electrodes in pH meter.
 - (2) Give one physiological importance of water.
 - (3) Write Henderson Hasselbalch equation.
 - (4) Give one factor that influences pH determination.
 - (5) What is Adsorption ?
 - (6) Between two solutions of 1 M glucose and 1 M NaCl which one will have higher osmotic pressure and why ?
 - (7) What is membrane hydrolysis ?
 - (8) What is the effect of temperature on surface tension ?
 - (9) What is Rf?
 - (10) What is stationary phase in paper Chromatography ?
 - (11) What is full form of HPLC ?
 - (12) Give any one application of electrophoresis.
 - (13) Name the monochromators used in Spectrophotometer.
 - (14) What is the role of detector in Colorimeter ?
 - (15) What is the relationship between OD and %Transmission ?
 - (16) What is the lamp or radiation source used in UV Spectrophotometer ?