

NOVEMBER/DECEMBER 2018

BBC31 — BIOCHEMICAL TECHNIQUES - I

Time : Three hours

Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. Define Osmotic pressure.
2. What will happen if rbc's are suspended in 1.5% saline?
3. What is buffering capacity?
4. Calculate the pH and pOH of a solution containing 1×10^{-7} M H^+ ions.
5. What is reference electrode?
6. Write any two applications of hydrogen electrode.
7. Which elutes first, smaller molecule or bigger one in a molecular sieve chromatography?
8. Define Svedberg unit.

9. What are the support materials used for different chromatographic techniques?

10. What is a rotor? Where it is used?

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) Explain the concept of osmosis.

Or

(b) Give the importance of isotonic, hypertonic and hypotonic solutions in biology.

12. (a) Briefly discuss about the concept of pH and pOH.

Or

(b) What is buffer? Give the buffer systems present in rbc's and their role.

13. (a) Explain the working of glass electrode.

Or

(b) Enumerate the applications of Clark's oxygen electrode.

14. (a) Write shortly on the applications of TLC.

Or

(b) Explain the principle of molecular sieving chromatography.

15. (a) Write down the applications of analytical ultracentrifuge.

Or

(b) Discuss about rate zonal centrifugation.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. How will you prepare 100 ml of (a) 1N NaOH (m.wt.40) (b) 1N HCl (from 10N HCl) (c) 1 Molal NaOH in water (d) 5 millimolar NaCl (m.wt. 56) (e) 2M H₂SO₄ (from conc H₂SO₄)

17. Derive the Henderson Hasselbalch equation. Give its importance.

18. Detail on the principle and instrumentation of Clark oxygen electrode.

19. Write elaborately on the principle, operation and applications of paper chromatography.

20. Elaborate on the methodology to determine the molecular weight of a protein using ultracentrifugation.