

(6 Pages)

Reg. No. :

Code No. : 20234 E Sub. Code : SAMI 11/
AAMI 11

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023.

First Semester

Microbiology — Allied

BIOINSTRUMENTATION

(For those who joined in July 2017–2020 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The pH of the buffer solution depends upon the concentration of
 - (a) Acid (H⁺) only
 - (b) Conjugate base (-OH⁻) only
 - (c) Salt
 - (d) Acid (H⁺) and conjugate base (-OH⁻)

2. A pH value less than 7.0 means that the solution is
 - (a) Conductive
 - (b) Caustic
 - (c) Alkaline
 - (d) Acidic
3. Hot air oven is used for sterilization of all except _____
 - (a) Glassware
 - (b) Rubber tubes
 - (c) Sharp instrument
 - (d) Liquid paraffin
4. In laminar air flow which types of filter is located
 - (a) Membrane filter
 - (b) Seitz filter
 - (c) HEPA filter
 - (d) Vacuum filter
5. Which of the following is used as a carrier gas in gas chromatography?
 - (a) Carbon dioxide
 - (b) Oxygen
 - (c) Helium
 - (d) Methane
6. Density gradient centrifugation is used to
 - (a) purify viruses, ribosomes, membranes
 - (b) remove dirt
 - (c) remove fine particles
 - (d) remove large particles

7. Which features are affecting electrophoresis mobility?
(a) Molecule size (b) Shape of protein
(c) (a) and (b) (d) None of the above
8. What is agarose gel?
(a) Cross linkage molecules
(b) Purified un change polysaccharide
(c) Prepared by dissolving 0.5% agarose in boiling water and allowing it to cool to 4°C
(d) All of the above
9. Detectors utilized in spectrophotometer
(a) Phtotube
(b) Photovoltaic cell
(c) Photomultiplier tube
(d) Diffraction grating
10. What is the advantage of spectroscopic methods?
(a) Amount of sample required is very small
(b) Time required for structure determination is mush less
(c) Detailed information is obtained
(d) All of these

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 250 words.

11. (a) What are the different types of electrodes and their uses?
Or
(b) What is buffer capacity? Mention few applications of buffer.
12. (a) Describe the process of sterilization in an autoclave.
Or
(b) Describe the parts of hot air oven and differentiate it from the incubator.
13. (a) Mention the commonly used matrix materials in column chromatography.
Or
(b) Write some applications of the analytical ultracentrifuge.
14. (a) Discuss the principles, method and application of agar gel electrophoresis.
Or
(b) Brief out the principle and uses of SDS-PAGE.

15. (a) Write short notes on UV-visible and IR spectroscopy.

Or

(b) Discuss the application of flame photometry in the determination of trace elements.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 600 words.

16. (a) What is meant by a molar solution? Explain millimolar solution with example.

Or

(b) Explain the applications of redox indicators in biology.

17. (a) Explain the principle and applications of laminar air flow.

Or

(b) Write the principle and application of incubator.

(a) Explain density gradient centrifugation.

Or

(b) Explain different types of ion-exchange resins and their uses.

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19. (a) Explain different types of gel electrophoresis.

Or

(b) Write about separation of serum proteins by paper electrophoresis.

20. (a) Explain in detail about electromagnetic radiation.

Or

(b) Describe the types and components of spectrophotometer.

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