

(6 pages)

Reg. No. :

Code No. : 30555 E Sub. Code : CAMI 11

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

First Semester

Microbiology — Allied — I

BIOINSTRUMENTATION

(For those who joined in July 2021-2022)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. _____ solutions will act as a buffer.
(a) HNO_2 and NaNO_2 (b) NaOH and NaCl
(c) HCl and KCl (d) HNO_3 and NH_4NO_3
2. The electrodes used in pH measurement have _____.
(a) very low resistance
(b) moderate resistance
(c) very high resistance
(d) no resistance
3. Identify the following instrument is used for sterilizing glassware
(a) Autoclave
(b) Hot air oven
(c) Laminar air flow chamber
(d) Both (b) and (c)
4. Predict the method in which the cells are frozen dehydrated form
(a) Pasteurization (b) Disinfection
(c) Dessication (d) Lyophilisation
5. In thin layer chromatography, the stationary phase is made of _____ and the mobile phase is made of _____.
(a) Solid, liquid (b) Liquid, liquid
(c) Liquid, gas (d) Solid, gas
6. Centrifugation based on the _____ law.
(a) Pascals law (b) Patrick law
(c) Stokes law (d) Stain law

7. Select the most common type of gel used for protein separation in SDS – PAGE.

- (a) Agar (b) Polyacrylamide
(c) Agarose (d) Alginate

8. _____ is an immunoelectrophoresis technique.

- (a) SDS-PAGE
(b) Counter immunoelectrophoresis
(c) 2D immunoelectrophoresis
(d) both (b) and (c)

9. Choose the wavelength range of the UV spectrum.

- (a) 400 – 800 nm (b) 25 μ m – 50 μ m
(c) 200 – 800 nm (d) Both (a), and (c)

10. The region of electromagnetic spectrum for nuclear magnetic resonance is _____.

- (a) Microwave
(b) Radio frequency
(c) Infra red
(d) UV ray

PART B — (5 × 5 = 25 marks)

Answer ALL the questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Discuss about the buffers.

Or

(b) Interpret the preparation of molar solution with one example.

12. (a) Explain the principle of incubator.

Or

(b) Determine the principle and application of autoclave.

13. (a) Evaluate the exchangers used in ion exchange chromatography.

Or

(b) Select the basic components of centrifuge.

14. (a) Predict the principle of slab gel electrophoresis.

Or

(b) Assess the working mechanism of immunoelectrophoresis.

15. (a) Describe briefly about the Raman spectroscopy.

Or

(b) Interpret the working principle of NMR.

PART C — (5 × 8 = 40 marks)

Answer ALL the questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Explain the challenges of preparing a buffer solution.

Or

(b) Illustrate the working mechanisms and application of pH meter.

17. (a) Determine the principle and application of laminar air flow chamber.

Or

(b) Illustrate the working mechanism of lyophilizer and its application.

18. (a) Analyze the instrumental components of HPLC with diagram.

Or

(b) Explain the working principle and their importance of centrifuge.

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19. (a) Distinguish between vertical and horizontal gel electrophoresis.

Or

(b) Summarize the principle and application of paper electrophoresis.

20. (a) Illustrate the instrumentation in X-ray spectroscopy.

Or

(b) Explain the principle, components, working procedure and application of flame photometer.

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