

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 :

- _____ 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
- The electrodes used in pH measurement have _____.
(a) very low resistance
(b) moderate resistance
(c) very high resistance
(d) no resistance

- 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)
- Predict the method in which the cells are frozen dehydrated form.
(a) Pasteurization (b) Disinfection
(c) Dessication (d) Lyophilisation
- 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
- Centrifugation based on the _____ law.
(a) Pascals law (b) Patrick law
(c) Stokes law (d) Stain law

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- Select the most common type of gel used for protein separation in SDS – PAGE.
(a) Agar (b) Polyacrylamide
(c) Agarose (d) Alginate
- _____ is an immunoelectrophoresis technique.
(a) SDS-PAGE
(b) Counter immunoelectrophoresis
(c) 2D immunoelectrophoresis
(d) both (b) and (c)
- Choose the wavelength range of the UV spectrum.
(a) 400 – 800 nm (b) 25 μm – 50 μm
(c) 200 – 800 nm (d) Both (a) and (c)
- The region of electromagnetic spectrum for nuclear magnetic resonance is _____.
(a) Microwave
(b) Radio frequency
(c) Infra red
(d) UV ray

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PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

- (a) Discuss about the buffers.
Or
(b) Interpret the preparation of molar solution with one example.
- (a) Explain the principle of incubator.
Or
(b) Determine the principle and application of autoclave.
- (a) Evaluate the exchangers used in ion exchange chromatography.
Or
(b) Select the basic components of centrifuge.
- (a) Predict the principle of slab gel electrophoresis.
Or
(b) Assess the working mechanism of immunoelectrophoresis.

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[P.T.O.]

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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