



MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

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University Examinations 2023/2024

SECOND YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF
BACHELOR OF BIOCHEMISTRY

SHC 3251: INTEGRATED BIOCHEMICAL TECHNIQUES I

DATE: APRIL 2024

TIME: 2 HOURS

INSTRUCTIONS: Answer question *one* and any other *two* questions

QUESTION ONE (30 MARKS)

- a) Outline 3 common experimental errors in measurement of P^H (3 marks)
- b) Explain briefly R_f value (2 marks)
- c) Differentiate between cation resins and anion resins used in ion exchange chromatography (4 marks)
- d) Describe two solvent systems used in column chromatography (2 marks)
- e) Differentiate between direct and indirect fluorescence analysis methods (2 marks)
- f) Describe briefly the forces in operation during paper chromatography (3 marks)
- g) Describe factors to consider when selecting a tracer (4 marks)
- h) Describe briefly manometry techniques in biology (3 marks)
- i) Explain stable and radioactive isotopes (3 marks)
- j) Describe two advantages and two disadvantages of packed and open tubular columns in gas chromatography (4 marks)

QUESTION TWO (20 MARKS)

- a) Discuss the principle of affinity chromatography (10 marks)
- b) Explain the applications of tracer techniques (10 marks)

QUESTION THREE (20 MARKS)

- a) Discuss the principle of gel filtration (10 marks)
- b) Describe the instrument and procedure used to measure beta (β) radiations (10 marks)

QUESTION FOUR (20 MARKS)

- a) Describe two instruments that measure fluorescence (8 marks)
- b) Diagrammatically explain the components of HPLC (12 marks)