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University Examinations 2024/2025

THIRD YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE BACHELOR OF SCIENCE IN BIOCHEMISTRY

SHC 3302: INTEGRATED BIOCHEMICAL TECHNIQUES II

DATE: JANUARY 2025 **TIME: 2 HOURS**

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

QUESTION ONE (30 MARKS)

a) Distinguish immersion from perfusion fixation (4 marks)

b) Explain briefly a swinging bucket rotor and a fixed angle rotor (4 marks)

c) Outline the purpose of SDS in SDS-PAGE (2 Marks)

d) Explain three factors to consider when choosing a material for forming gradients in density centrifugation (3 marks)

e) Describe briefly three factors that can affect enzyme activity (3 marks)

f) Outline the equation that governs all types of electrophoresis (3 marks)

g) Explain briefly two methods used to apply samples on an electrophoretic paper (2 marks)

h) Describe the concept of molecular sieving in gel electrophoresis (3 marks)

i) Explain two (2) methods of creating pH gradients in ISo-electric focussing (2 marks)

j) Outline two advantages of using alternating electrical fields in pulsed gel electrophoresis (2 marks)

k) Differentiate continuous and discontinuous enzyme assays (2 marks)

QUESTION TWO (20 MARKS)

a) Describe the steps involved in subcellular fractionation (10 marks)

b) Discuss the steps involved in western blotting (10 marks)

QUESTION THREE (20 MARKS)

a) Differentiate between differential and density gradient centrifugation (10 marks)

b) Discuss SDS-PAGE (10 marks)

QUESTION FOUR (20 MARKS)

a) Describe the principles of simple and coupled NAD^+ (p) linked spectrophotometry (10 marks)

b) Explain the principles of 2D-PAGE and its application in protein analysis (10 marks)