



UNIVERSITY EXAMINATIONS

THIRD YEAR EXAMINATION FOR THE AWARD OF DEGREE OF
BACHELOR OF SCIENCE IN BIOCHEMISTRY

BIOC 342: INTEGRATED LABORATORY TECHNIQUES II

STREAMS: Y3S2

TIME: 2 HOURS

DAY/DATE: FRIDAY 12/4/2024

8.30 A.M. –10.30 A.M.

INSTRUCTIONS:

- i) Answer question ONE and any other TWO questions
- ii) Do not write anything on the question paper

QUESTION ONE (30 MARKS)

- (a) Give the factors to consider for a successful rate zonal centrifugation. (4 marks)
- (b) Describe the Bradford assay technique as applied in protein determination. (6 marks)
- (c) A fixed-angle rotor exhibits a minimum radius, r_{min} , at the top of the centrifuge tube of 3.5 cm and a maximum radius, r_{max} , at the bottom of the tube of 7.0 cm. If the rotor is operated at a speed of 20,000 r.p.m., what is the relative centrifugal field, RCF, at the top and bottom of the centrifuge tube? (6 marks)
- (d) Briefly describe how polyacrylamide gels are prepared. (6 marks)
- (e) Describe the application of silver staining in protein detection following electrophoresis. (8 marks)

QUESTION TWO (20 MARKS)

- (a) Describe how the Laemmli discontinuous buffers are used in gel electrophoresis. (10 marks)
- (b) Describe how one can assay the activity of following enzymes. (10 marks)
 - I. Fumarase
 - II. Pyruvate dehydrogenase
 - III. α -ketogluterate dehydrogenase
 - IV. Succinly coA synthetase

V. Hexokinase

QUESTION THREE (20 MARKS)

- (a) Describe the various biochemical processes in which centrifugation technique can be applied. (10 marks)
- (b) Describe the application of density gradient centrifugation as a separation technique. (10 marks)

QUESTION FOUR (20 MARKS)

- (a) Describe the Edman degradation chemistry of protein mapping. (10 marks)
 - (b) Describe how proteases can be used to achieve peptide mapping. (10 marks)
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