

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

THIRD YEAR EXAMINATION FOR THE AWARD OF DEGREE OF BIOMEDICAL SCIENCE AND TECHNOLOGY

BMET 350: BIOMEDICAL TECHNIQUES

STREAMS: BSc. BIOMEDICAL SCIENCE & TECH

TIME: 2 HOURS

DAY/DATE: TUESDAY 18/4/2023

8.30 A.M. – 10.30 A.M.

INSTRUCTIONS:

- i) Answer Question One and Any Other Two Questions
- ii) Do not write on the question paper

QUESTION ONE (30 marks)

- a) State the underlying principle of spectrophotometry and hence outline its advantages. (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 3.5cm, and a maximum radius, r_{max} , at the bottom of the tube of 7.0cm. 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 the 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 you can assay the activity of following enzymes. (10 marks)

- I. Fumarase
- II. Pyruvate dehydrogenase
- III. α -ketoglutarate dehydrogenase
- IV. Succinyl coA synthetase
- V. Hexokinase.

QUESTION THREE (20 marks)

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