

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

**EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN
BIOMEDICAL SCIENCE AND TECHNOLOGY**

BMET 350: BIOMEDICAL TECHNIQUES

STREAMS:

TIME: 2 HOURS

DAY/DATE: THURSDAY 08/07/2021

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. Give 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 3.5 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 you can assay the activity of following enzymes (10 marks)
- I. Fumerase
 - II. Pyruvate dehydrogenase
 - III. α -ketogluterate dehydrogense
 - IV. Succinyl 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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