**CHUKA**  **UNIVERSITY**



**UNIVERSITY EXAMINATION**
**RESIT/SUPPLEMENTARY / SPECIAL EXAMINATIONS**
**EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN BIOCHEMISTRY**

**BIOC 342/303: INTEGRATED LAB TECHNIQUES II**

**STREAMS: BSC. BIOC (Y3S2)** **TIME: 2 HOURS**

**DAY/DATE: WEDNESDAY 11/08/2021** **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. Explain the working principle of polymerase chain reaction. (5 marks)
b. Describe the Bradford assay technique as applied in protein determination. (5 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 agarose gels are prepared. (6 marks)
e. Describe the application differences between sandwich and competitive ELISA. (8 marks)

**Question Two (20 marks)**

a. Describe how the Laemmli discontinuous buffers are used in gel electrophoresis. (10 marks)
b. Describe the principle of isoelectric focusing as applied in protein determination. (10 marks)

**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 principle behind western blot technique. (10 marks)

b. Describe the amplification of DNA using the cell based approach. (10 marks)

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