TECHNICAL UNIVERSITY OF MOMBASA

School of Applied and Health Sciences

DEPARTMENT OF PURE AND APPLIED SCIENCES

UNIVERSITY EXAMINATION FOR:

BACHELOR OF SCIENCE IN BIOCHEMISTRY

ABC 4401: REGULATION AND INTEGRATION OF METABOLISM

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2024 SERIES

TIME: 2 HOURS

DATE: DECEMBER 2024

Instructions to Candidates

You should have the following for this examination

Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attemptquestion ONE (Compulsory) and any other TWO questions.

Do not write on the question paper.

Question One (30 Marks)

i. Differentiate between positive and negative nitrogen balance (4 Marks)

ii. Give the functions of any four metabolic pathways in mammalian body (4 Marks)

iii. Name three metabolites that increase in the absorptive stage of catabolism (3 Marks)

iv. Rate of metabolic processes in an organism depend on its stage. Explain (3 marks)

v. List four benefits of representing metabolic pathways on a map (4 Marks)

vi. Explain the effect of glucocorticoid on glycogen metabolism in different tissues (4 Marks)

vii. Explain the function of epinephrine in the regulation of metabolism (5 Marks)

viii. State any three signs of abundant energy whichallosterically inhibit pyruvate kinase (3 Marks)

Question Two (20 Marks)

(i) Discuss the functions of the major organs involved in the integration of metabolism (14 Marks)

(ii) Discuss any two fates of pyruvate (6 Marks)

Question Three (20 Marks)

(i) Discuss two methods used in the coarse control mechanism to tag enzymes before they undergo protease degradation (12 Marks)

(ii) Explain the mechanism of metabolic regulation through regulation of enzyme activities (8 Marks)

Question Four (20 Marks)

Discuss the regulation of gluconeogenesis (20 Marks)

Question Five (20 Marks)

(i) With an illustration explain phosphorylation in the control of glycogen synthase (10 Mark)

(ii) Discuss how AMP affects pathways in different tissues (5 Marks)

(iii) Explain how the regulation of cholesterol metabolism occurs (5 Marks)