PAPER 2

TECHNICAL UNIVERSITY OF MOMBASA

School of Applied and Health Sciences

DEPARTMENT OF PURE AND APPLIED SCIENCES

UNIVERSITY EXAMINATION FOR:

DIPLOMA IN INDUSTRIAL MICROBIOLOGY AND BIOTECHNOLOGY

ABT 2211 BIOCHEMICAL TECHNIQUES AND INSTRUMENTATION

END OF SEMESTER EXAMINATION

SERIES: JULY 2025 SERIES

TIME: 2 HOURS

DATE: JULY 2025

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)

a) Name any three buffer used in electrophoresis. **(3marks)**

b) Differentiate between differential and density gradient centrifugation **(4marks)**

c) Name any four types of chromatography stating their uses **(12marks)**

d) **Calculate the pH of a solution containing 0.4grams of sodium hydroxide per litre.** **(3marks)**

e) **Enlist three buffers found in the biological systems** **(3marks)**

f) **Highlight five use of analytical centrifugation.** **(5marks)**

QUESTION TWO (15 MARKS)

a) **Name any two rotors used in centrifuge.** **(2marks)**

b) **List four factors influencing centrifugation.** **(4marks)**

c) **Give three forces which are involved in centrifugation.** **(3marks)**

d) **Discuss differential centrifugation**. **(6marks)**

QUESTION THREE (15 MARKS)

a) State the principle of electrophoresis. (5Marks)

b) Discuss polyacrylamide gel electrophoresis. (6marks)

c) State the applications of polyacrylamide gel electrophoresis. (4marks)

QUESTION FOUR (15MARKS)

Discuss the principles, instrumentation and applications of atomic absorption spectroscopy. **(15marks)**

QUESTION FIVE (15 Marks)

a) Describe the concentration of proteins solution by precipitation method

i) Using ammonium sulphate. (5marks)

ii) Using organic polymers (3marks)

b) Give four disadvantage of protein precipitation method. (4markks)

c) State three advantages of concentration of proteins by precipitation technique. (3marks)