

UNIVERSITY EXAMINATIONS

FIRST SEMESTER 2025/2026 ACADEMIC YEAR

**FOURTH YEAR EXAMINATION FOR THE DEGREE OF
BACHELOR OF BIOMEDICAL SCIENCE AND
TECHNOLOGY**

BMED 412: LABORATORY RECOMBINANT DNA TECHNIQUES

STREAM: R

TIME: 2 HRS

DAY: TUESDAY [14.30 – 16.30 P.M]

DATE: 03/02/2026

THIS QUESTION PAPER CONSISTS OF THREE (3) PAGES

PLEASE DO NOT OPEN UNTIL THE INVIGILATOR SAYS SO.

Answer all the questions in section A and any of the two questions in B

SECTION A (40 MARKS)

QUESTION ONE

Outline the key features of the Watson-Crick model of DNA structure. **(5 Marks)**

QUESTION TWO

Give a brief account of the process of DNA isolation and purification. **(5 Marks)**

QUESTION THREE

List any five types of enzymes used in recombinant DNA technology and their functions. **(5 Marks)**

QUESTION FOUR

Outline industrial applications of recombinant DNA technology. **(5 Marks)**

QUESTION FIVE

Explain the principle of Northern blot analysis and its applications. **(5 Marks)**

QUESTION SIX

Give a summary of the synthesis of double-stranded cDNA. **(5 Marks)**

QUESTION SEVEN

Explain the principle of polymerase chain reaction (PCR) and its applications. **(5 Marks)**

QUESTION EIGHT

Elaborate the concept of mutagenesis and its applications. **(5 Marks)**

SECTION B (30 MARKS): ANSWER ANY TWO QUESTIONS

QUESTION NINE

Discuss the process of mapping the human genome.

(15 Marks)

QUESTION TEN

Describe the different types of protein analysis techniques.

(15 Marks)

QUESTION ELEVEN

Describe the process of creating a recombinant DNA molecule.

(15 Marks)