

UNIVERSITY EXAMINATIONS

FIRST SEMESTER 2025/2026 ACADEMIC YEAR

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

BMED 415: FUNDAMENTAL OF BIOPROCESSING

STREAM: R

TIME: 2 HRS

DAY: FRIDAY [8.30 – 10.30 A.M]

DATE: 06/02/2026

THIS QUESTION PAPER CONSISTS OF THREE (3) PAGES

PLEASE DO NOT OPEN UNTIL THE INVIGILATOR SAYS SO.

INSTRUCTIONS:

- (i) **Answer ALL questions in Section A and Any Other TWO in Section B.**
- (ii) **Do NOT write on the Question paper.**
- (iii) **Illustrate your Answers with diagrams where possible.**

SECTION A (40 MARKS)**QUESTION ONE**

Explain the engineering principles that are involved in reprogramming human cells like the CAR-T cells.

(6 Marks)

QUESTION TWO

Outline the downstream bioprocessing.

(5 Marks)

QUESTION THREE

Give aspects under which Biotechnology has been defined.

(4 Marks)

QUESTION FOUR

Outline vaccines that were experimentally produced during Covid-19 pandemic.

(3 Marks)

QUESTION FIVE

Explain the term Genetic Engineering.

(6 Marks)

QUESTION SIX

Elaborate the importance of photosynthesis in Bioprocessing.

(6 Marks)

QUESTION SEVEN

List examples of biosensors.

(3 Marks)

QUESTION EIGHT

(a) Give a brief account of the gel Entrapment Method

(5 Marks)

(b) Mention the importance of process control

(2 Marks)

SECTION B. ANSWER ANY TWO QUESTIONS.

QUESTION NINE

Give an account on factors to consider when designing a bioreactor.

(15 Marks)

QUESTION TEN

Discuss the classes of enzymes in accordance with the International Union of Biochemists and Molecular Biology (IUBMB).

(15 Marks)

QUESTION ELEVEN

Discuss Cell energetics in respect to

(a) Electron Transport Chain.

(8 Marks)

(b) Anaerobic respiration

(7 Marks)