



UNIVERSITY EXAMINATIONS

**EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF
SCIENCE IN BIOCHEMISTRY**

BIOC 230: FUNDAMENTALS OF BIOTECHNOLOGY

STREAMS: BSc Biochemistry

TIME: 2 HOURS

DAY/DATE: FRIDAY 12/4/2024

11.30A.M. –1.30 P.M.

INSTRUCTIONS:

- i) Answer Question One and ANY OTHER TWO Questions**
- ii) Do not write on the question paper**

QUESTION ONE (30 marks)

- (a) List the uses of enzymes derived from recombinant microorganisms, plant cells, and animal cells. (4 marks)
- (b) Outline major applications of animal cell culture. (4 marks)
- (c) Outline the main functions of an impeller. (3 marks)
- (d) State factors that influence bulk mixing and micro mixing. (4 marks)
- (e) Outline the disadvantages of producing organic compounds by biological rather than chemical means. (4 marks)
- (f) Outline the basic steps involved in the process of the recombinant DNA technique for gene cloning. (4 marks)
- (g) Briefly describe transfection as a method used for the transformation of cultured cells. (3 marks)
- (h) Outline fermentation factors that affect downstream processing.

QUESTION TWO (20 marks)

- (a) Outline the major steps involved in plant-tissue culture. (7 marks)
- (b) Discuss the methods of genetic recombination in bacteria. (13 marks)

QUESTION THREE (20 marks)

- (a) Discuss batch cultivation as one of the main biotechnological processes for growing microorganisms in the bioreactor. (10 marks)
- (b) Discuss bacterial strain improvement via mutation. (10 marks)

QUESTION FOUR (20 marks)

- (a) Outline the major applications of microbial cultures. (6 marks)
 - (b) Describe reactor engineering. (14 marks)
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