

CHUKA



UNIVERSITY

RESIT/ SPECIAL EXAMINATIONS

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

BIOC 410: BIOTECHNOLOGY I

STREAMS: BSC (BIOCHEM) Y4S1

TIME: 2 HOURS

DAY/DATE: MONDAY 23/07/2018

8.30 AM – 10.30 AM

INSTRUCTIONS:

- i. Answer question one and any other two questions**
- ii. Do not write on the question paper**

Question One (30 marks)

- a. State the disadvantages of using bacteria to produce single cell protein. (3 marks)
- b. Outline the uses of liquid-solid mass transfer. (4 marks)
- c. What should be the basic points of consideration while designing a fermenter? □(5 marks)
- d. Murine monoclonal antibodies have both advantages and disadvantages. Justify this statement. (4 marks)
- e. State the main advantages of fed-batch over batch cultures. (4 marks)
- f. State the four main types of agitator commonly used in the bioreactors. (4 marks)
- g. Elucidate the different methods of bioreactor sterilization. (4 marks)
- h. The function of the fermenter or bioreactor is to provide a suitable environment in which an organism can efficiently produce a target product. State target products that can be produced in a bioreactor. (2 marks)

Question Two (20 marks)

a. Discuss considerations that improve productivity of bioreactor. (10 marks)

b. Discuss the advantages of plant tissue culture. (10 marks)

Question Three (20 marks)

a. Discuss batch cultivation. (10 marks)

b. Discuss the stages of downstream processing. (10 marks)

Question Four (20 marks)

a. Discuss precautions that should be taken to avoid cross contamination when handling cell lines. (7 marks)

b. Outline precautions that should be observed to avoid microbial contamination. (3 marks)

c. Describe how human insulin is synthesized in *E. coli*. (10 marks)
