



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE & APPLIED SCIENCES

UNIVERSITY EXAMINATION FOR:

BTMB

ABT 4306: DOWNSTREAM PROCESSING: PAPER 2

SPECIAL SUPPLEMENTARY EXAMINATION

SERIES: AUGUST 2017

TIME: 2 HOURS

DATE: Pick Date Sep 2017

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other **TWO** questions.

Do not write on the question paper.

Question ONE

a) Highlight the precipitation of macromolecules using the following compounds:

i) Neutral salts (2 marks)

ii) Organic solvents (2 marks)

iii) Non-ionic polymers (2 marks)

b) List the advantages of membrane based separation (5 marks)

c) Using a flow diagram highlight the upstream processing of pharmaceutical products (5 marks)

d) Differentiate between rate zonal and isopycnic separation (4 marks)

e) List the names of microorganism that produce the antibiotics below (5 marks)

Antibiotic	Producing microorganism
Bacitracin	
Erythromycin	
Griseofulvin	
Lincomycin	
Neomycin	

f) With the aid of a drawing, explain the differences between the cell walls of gram positive bacteria and yeast (5 marks)

Question TWO

a) Explain the final product fill in downstream processing (10 marks)

b) Describe SDS lysis of cell membrane method used in downstream processing (10 marks)

Question THREE

Explain how the following mechanisms alter the biological activity of proteins:

i) Protein deamidation (10 marks)

ii) Oxidation of methionine and cystine amino acids (10 marks)

Question FOUR

a) Describe size exclusion chromatography of a protein (10 marks)

b) Explain diafiltration process and its application in downstream processing (10 marks)

Question FIVE

Explain the industrial production of Penicillin and its derivatives (20 marks)