



Technical University of Mombasa

Faculty of Applied and Health Sciences

DEPARTMENT OF PURE AND APPLIED SCIENCES

UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF
TECHNOLOGY IN INDUSTRIAL MICROBIOLOGY AND BIOTECHNOLOGY
BIMBT 10M

SBT 2442: GENETIC ENGINEERING I

SPECIAL/SUPPLEMENTARY EXAMINATION

FEBRUARY 2013 SERIES

2 HOURS

Instructions to candidates:

This paper consist of **FIVE** questions

Answer question **ONE** (compulsory) and any other **TWO** questions

Question ONE

- a) Define the following terms :
 - i) Sieving (2marks)
 - ii) Chimera DNA (2marks)
 - iii) Palmdromic sequence (2marks)
- b) Differentiate between southern and northern blotting (4marks)
- c) List the **FOUR** stages of DNA separation from cellular components (4marks)
- d) Name **TWO** reasons for the limited range of applications for crude lysates as DNA source (4marks)
- e) Name **TWO** types of cohesive ends (2marks)
- f) State how an enzymes activity is estimated (2marks)
- g) List any **FOUR** types of cloning vectors in order of the DNA size each can pack (start

with the smallest) **(4marks)**

h) State any TWO reasons for amplifying DNA by polymerase chain reaction (PCR) **(2marks)**

i) Name TWO uses that polyacrylamide gel electrophoresis (PAGE) is suitable for **(2marks)**

Question TWO

a) Describe the classical procedure of gene cloning **(12marks)**

b) Describe DNA isolation by salting-out method **(8marks)**

Question THREE

a) Highlight the main distinctions between restriction enzymes I, II and III **(7marks)**

b) Describe the principle of conventional and real time PCR technology **(13marks)**

Question FOUR

a) Describe restriction mapping procedure **(10marks)**

b) Describe DNA spacing by addition of homopolymers **(10marks)**

Question FIVE

a) Plasmids are suitable as cloning vectors. Explain **(10marks)**

b) Describe the principle of nucleic acid hybridization **(10marks)**