# TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE & APPLIED SCIENCES

**UNIVERSITY EXAMINATION FOR:**

BACHELOR OF TECHNOLOGY IN INDUSTRIAL MICROBIOLOGY AND BIOTECHNOLOGY

Type unit code : ABT 4307: PROTEIN BIOTECHNOLOGY

END OF SEMESTER EXAMINATION

**SERIES:** APRIL 2016

**TIME:** 2 HOURS

**DATE:** 13 May 2016

**Instructions to Candidates**

You should have the following for this examination

*-Answer Booklet, examination pass and student ID*

This paper consists of Choose No questions. Attempt Choose instruction.

**Do not write on the question paper.**

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**Question ONE**

a) Name any 2 strains of filamentous fungi that are used as expression systems for producing recombinant proteins (2mks)

b) Outline 3 foldases that accelerate the rate-limiting steps in enhancing *in vivo* folding of recombinant proteins (6mks)

c) Name any 3 genera of methylotrophic yeasts (3mks)

d) Name any 2 proteins expressed by transgenic goats (2mks)

e) Highlight the benefits associated with exploiting transgenic trypanosomes expression systems for proteins (3mks)

f) Explain the difference between animal and microbial cells (3mks)

g) Describe advances in recombinant DNA technology that has been adopted in the production of industrial enzymes (4 mks)

h) Highlight recombinant pharmaceutical products that have radically improved human health care (4 mks)

i) State the advantages of using animal bladder as a bioreactor instead of the mammary gland for the production of recombinant products (3mks)

**Question TWO**

a) Explain the of role of Glycosylation in the production of recombinant proteins (10mks)
b) Describe the advantages of *Bacillus* as expression systems for proteins (10mks)

**Question THREE**

Discuss co-expression of chaperones and foldases as strategies for enhancing the solubility of proteins (20mks)

**Question FOUR**

Discuss the benefits of recombinant protein production in plants over cell cultures and live animals (20mks)

**Question FIVE**

Describe the industrial role of the following proteins from higher plants
a) Papain (10mks)
b) Ficin (10mks)