



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE & APPLIED SCIENCES

UNIVERSITY EXAMINATION FOR:

BTMB

ABT 4301: GENETIC ENGINEERING 1

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2016

TIME: 2 HOURS

DATE: Pick Date Dec 2016

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. Define the following terminologies:

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|--------------------|----------|
| i. Attenuators | (1 mark) |
| ii. Exons | (1 mark) |
| iii. Operon | (1 mark) |
| iv. Taq polymerase | (1 mark) |

b. Give the full meanings of the following acronyms.

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|-----------|----------|
| i. PFE | (1 mark) |
| ii. TBE | (1 mark) |
| iii. tRNA | (1 mark) |
| iv. dNTPs | (1 mark) |

- c. List the disadvantages of the Guanidinium Thiocyanate-Phenol-Chloroform DNA extraction method. (5 marks)
 - d. Outline the THREE possible ways of genetic modification using rDNA technology. (3 marks)
 - e. State the demerits of radioisotopes as a method of DNA staining. (4 marks)
 - f. Explain the rationale of measuring absorbance of the DNA solution at wavelengths 260 nm and 280 nm. (4 marks)
- (a) Describe bacterial plasmids. (6 marks)

Question TWO

Discuss the application of Polymerase chain reaction (PCR) in research. (20 marks)

Question THREE

- a) Describe the FIVE factors affecting gel electrophoresis. (10 marks)
- b. Explain the principle of the blue-white screening method in determining a successful ligation. (10 marks)

Question FOUR

- a) Explain the principle of silica matrices in nucleic acid purification. (5 marks)
- b) Discuss the salting-out method of nucleic acid extraction. (7 Marks)
- c) A student programmed his PCR conditions as follows: 95°C for 3 minutes, 94° C for 45 seconds, 72° C for 1 minute, 72° C for 5 minutes. Explain what happened in the PCR. (8 marks)

Question FIVE

- a) Describe the key steps in polymerase chain reaction (PCR). (7 marks)
- b) Explain the Northern blot hybridization. (13 marks)