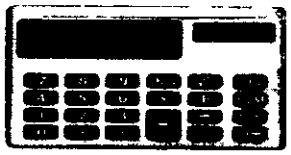
UNIVERSITY EXAMINATIONS



UNIVERSITEITSEKSAMENS

UNISA university of south africa

BIT2601

May/June 2018

Biotechnology

Duration 2 Hours

100 Marks

EXAMINERS :

FIRST	MS AAC HARRIS
SECOND	PROF SL LEBELO

Programmable pocket calculator is permissible

Closed book examination

This examination question paper remains the property of the University of South Africa and may not be removed from the examination venue.

You have two (2) hours to answer all the questions

Answer the questions in the examination answer book provided

[TURN OVER]

QUESTION 1 **[20]**

Define/explain the following terms

1 1 plasmid DNA vectors
1 2 restriction site
1 3 transformation
1 4 cDNA libraries
1 5 aerobic metabolism
1.6 reduction
1.7 bioremediation
1.8 thermophiles
1.9 biosensor technology
1 10 autocidal control

(2 x 10 = 20)

QUESTION 2 **[20]**

2 1 A researcher wishes to create multiple copies of a particular gene, but only has a small sample of DNA Describe the optimal technique for amplifying this DNA. (10)

2 2 Distinguish between genomic libraries and complementary DNA (cDNA) libraries and name the disadvantages of each. (10)

QUESTION 3 **[20]**

3.1 Explain how bacteria are able to metabolise organic chemicals such as toluene and benzene to less harmful substances (5)

3.2 Discuss how transgenic animals may be used as bioreactors and how this is related to genetic knockout technology. (5)

3.3 Explain why knockout experiments are effective predicative tools for testing how pharmaceutical drugs will affect humans. (2)

3.4 Discuss the term "phytoremediation" and the various subsets of phytoremediation (8)

QUESTION 4 **[25]**

4 1 Provide an extensive list of the various fields of applications of biotechnology. Include examples. (12)

4.2 Explain the various advantages and disadvantages of genetically engineered foods. (10)

4 3 Discuss the term "plant transgenesis" and the importance of plant transgenesis in biotechnology. (3)

QUESTION 5 **[15]**

5 1 Briefly explain how and why the Sanger method has been replaced by computer-automated DNA sequencing. (4)

5.2 Briefly explain the principle of agarose gel electrophoresis (6)

5 3 In a mixture of protein samples, the protein of interest is labelled with a histone ligand Describe a chromatographic technique that can be used to identify this protein and explain the basic principle of chromatography (5)

TOTAL MARKS: 100