



UNIVERSITY OF GHANA

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BSC. ENGINEERING FIRST SEMESTER EXAMINATIONS: 2018/2019

DEPARTMENT OF FOOD PROCESS ENGINEERING

FPEN 311: INTRODUCTION TO BIOTECHNOLOGY (2 Credits)

INSTRUCTIONS: ANSWER ANY FOUR (4) QUESTIONS.

TIME ALLOWED: TWO (2) HOURS

1.
 - a. Differentiate between modern and traditional biotechnology. Use examples to illustrate your answer.
 - b. Nucleic acids are the basic store of genetic information in all cells. Explain in detail how the structure and function of nucleic acids allows the storage, decoding and usage of genetic information.
2.
 - a. Modern biotechnology techniques can be applied to manipulate and alter the genetic material of different organisms. Using a specific example, describe the complete process involved in the modification of microbial genetic material to produce a food additive of your choice.
 - b. Differentiate between primary and secondary metabolism in microorganisms.
3.
 - a. Identify five (5) features that you would consider as critical in designing a fermenter. Give reasons for your selection.
 - b. Using flow diagrams, describe in detail the process for the production of the following products
 - i. Yoghurt
 - ii. Kenkey
 - iii. Gari
4. Write brief explanatory notes on the following:
 - a. Restriction endonucleases and their application in genetic engineering.
 - b. The Central Dogma of Genetics.

- c. The options available for downstream processing of products generated through industrial microbiology.
- d. Reproductive and Therapeutic Cloning.
- e. The polymerase chain reaction

- 5.
- a. Discuss the key ethical issues that arise in response to the application of modern biotechnology techniques. Your answer should include arguments both for and against modern biotechnology.
 - b. Briefly explain the following:
 - i. The use of Reverse Transcriptase in Genetic Engineering
 - ii. Differentiate between Batch, Continuous and Fed-Batch Fermentation
 - iii. Synthesis of complementary DNA (cDNA)

