

UNIVERSITY OF GHANA
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BSC. FIRST SEMESTER EXAMINATIONS: 2015/2016

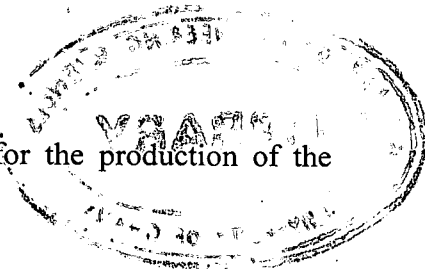
DEPARTMENT OF FOOD PROCESS ENGINEERING

FPEN 311: INTRODUCTION TO BIOTECHNOLOGY (2 Credits)

INSTRUCTIONS: ANSWER ANY FOUR QUESTIONS

TIME ALLOWED: TWO (2) HOURS

1. Modern biotechnology techniques can be applied to manipulate and alter the genetic material of different organisms. Using a specific example, discuss the complete process involved in the modification of the genetic material of a plant to exhibit a new trait.
2.
 - a. The process of genetic engineering involves the isolation of the genomic DNA of interest.
 - i. What are the challenges associated with isolating DNA from a eukaryotic cell for later insertion into a prokaryotic cell?
 - ii. How are these challenges addressed?
 - b. Nucleic acids are the basic store of genetic information in all cells. Explain how the structure and function of nucleic acids allows the storage, decoding and usage of genetic information.
3.
 - a. Differentiate between the following pairs
 - i. primary and secondary metabolism of microorganisms
 - ii. Batch and continuous fermentation
 - iii. Somatic Cell Nuclear Transfer and Microinjection
 - b. Describe the essential features of a typical Aerated Stirred Tank Batch Fermenter.



4.
 - a. Using flow diagrams, describe in detail the process for the production of the following condiments
 - i. Vinegar
 - ii. Dawadawa
 - b. What are the benefits associated with the fermentation of African foods?
5.
 - a. The discovery of restriction endonucleases was an important landmark in genetic engineering. What are restriction endonucleases and exactly how are they used in genetic engineering?
 - b. Explain the Central Dogma of Genetics.
 - c. Differentiate between modern and traditional biotechnology. Use examples to illustrate your answer.

