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**University Examinations 2016/2017**

THIRD YEAR, FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF FOOD SCIENCE AND TECHNOLOGY, BACHELOR OF FOOD SCIENCE AND NUTRITION.

**AFT 3306: CEREAL SCIENCE**

**DATE: DECEMBER, 2016 TIME: 2 HOURS**

**INSTRUCTIONS: -** *Answer question* ***one*** *and any other* ***two*** *questions*

**QUESTION ONE (30 MARKS)**

1. Define the following terms;
2. Food security. (1 mark)
3. Sustainable agriculture. (1 mark)
4. Briefly explain the moisture gradient in the conditioned grain. (4 marks)
5. Briefly explain the factors that may lead to damage of grains during storage. (5 marks)
6. Define resistant starches. Outline three uses of starch. (3 marks)
7. Explain the aim of starch modification. Differentiate between physical and chemical modification of starches. (3 marks)
8. Explain the purpose of steeping maize grain during wet-milling process. (5 marks)
9. Outline the general steps involved in oat processing. Briefly explain the aim of thermal treatment applied to oats during processing. (5 marks)
10. Explain the aim of decortications and how it achieved in sorghum and millet processing. (3 marks)

**QUESTION TWO (20 MARKS)**

1. Describe ‘parboiling’ in rice processing. Briefly explain its advantages. (10 marks)
2. Discuss the occurrence of carbohydrates and lipids in cereal grains. (10 marks)

**QUESTION THREE (20 MARKS)**

1. Discuss the biochemical changes that take place during grain storage. (10 marks)
2. Briefly discuss the principles of cleaning of cereal grains using wheat as an example. (10 marks)

**QUESTION FOUR (20 MARKS)**

1. Discus the enzymatic production of pure crystalline glucose form wet-milled maize starch. (15 marks)
2. Briefly describe the byproducts of wet milling of maize and their industrial uses. (5 marks)