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UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER

2018

PROGRAMME: B.SC.

COURSE CODE: ABE 406

TITLE OF PAPER: CROP PROCESSING AND STORAGE

ALLOWED TIME: TWO (2) HOURS

SPECIAL MATERIAL REQUIRED: CALCULATOR.

INSTRUCTIONS: ANSWER QUESTION ONE AND ANY TWO OTHER QUESTIONS

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SECTION ONE: COMPULSORY QUESTION

QUESTION ONE

a) Give four reasons why high temperature is undesirable for most stored agricultural products. (12 marks)

b) Explain why drying grain is considered a loss to a farmer. (6 marks)

c) i) Calculate the moisture shrink when drying peanuts from 12 percent to 10 percent moisture content (6 marks)

ii) If a farmer has harvested 150 tonnes of peanuts at 12 percent moisture, what would be the weight after drying to 10 percent moisture. (6 marks)

d) Discuss clearly the implication of the following statement, "the upper limit of relative humidity for sowing seed is 40% whereas the lower limit of relative humidity for tubers is 80%". (10 marks)

SECTION II: ANSWER ANY TWO QUESTIONS

QUESTION TWO

a) With the aid of neat schematic representations, explain the principle of operation of the following artificial dryers;

i) Counter flow (5 marks)
ii) Concurrent flow (5 marks)
iii) Mixed flow (5 marks)

b) Discuss three factors that are responsible for causing damage to sowing seeds, stating clearly how each factor is implicated. (9 marks)

c) One alternative method of storing tubers is to leave them on the ground particularly during the dry season. Discuss three disadvantages of such a technique. (6 marks)

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QUESTION THREE

a) A farmer's harvest 10 tonnes of maize at a moisture content of 18 % and stores it in an open storage for three weeks. When shelling the maize he realized that he had only 8.8 tonnes left. At what moisture content was the maize at shelling? (10 marks)

b) What happens to an agricultural product when the relative humidity of the drying air is lower than the equilibrium relative humidity that corresponds with the moisture content of the product? (5 marks)

c) Give two reasons why respiration is a problem in food storage. (5 marks)

d) Name five possible methods of storing seeds and or grains. (10 marks)

QUESTION FOUR

a) Discuss five key attributes of a storage material. (10 marks)

b) Moisture content of grain is usually determined on a wet basis MC_{wb} (%). Scientist sometimes use the dry basis MC_{db} (%).

i) Write the expressions for the two equations, clearly naming the parameters. (10 marks)

ii) Given that the moisture content on a dry basis is 8 %, calculate the moisture content on a wet basis. (10 marks)