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**University Examinations 2014/2015**

FOURTH YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN FOOD SCIENCE AND TECHNOLOGY

**AFN 3452: POST HARVEST TECHNOLOGY OF NON-PERISHABLES**

 **DATE: APRIL 2015 TIME: 2 HOURS**

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

**QUESTION ONE (30 MARKS)**

1. Define the following terms as used in post harvest technology
2. Food loss and food damage
3. Post harvest period
4. Hysteresis
5. Equilibrium moisture content (5 Marks)
6. 1000 kilograms of grains were dried in an oven to 12% moisture content on wet basis. Determine the dry matter and moisture content in dry basis (3 Marks)
7. List five insects of importance to grains during storage and specify which grain they are associated with (5 Marks)
8. Define water activity and explain storage of nuts at very low water activities (3 Marks)
9. List three types of equipment that can be used to move grains within a store indicating the grains they are used for (3 Marks)
10. Differentiate between direct and indirect grain driers (2 Marks)
11. Mixing grains with sand or wood-ash was used traditionally to control grain insects. Briefly explain (3 Marks)
12. Differentiate between quantitative and qualitative loss giving example of each (2 Marks)
13. In Kenya there are high incidences of aflatoxin poisoning from consumption of grains. Briefly highlight sources of aflatoxin and methods of controlling its production (2 Marks)
14. To reduce transport costs, grains are dried and transported. Following transport, it is possible to equilibrate the grains to a higher moisture content to increase the weight. Briefly discuss what is the main disadvantage of this process (2 Marks)

**QUESTION TWO (20 MARKS)**

1. Discuss the mechanism by which fumigant work when applied to grains to control insects (10 Marks)
2. A farmer dried grains with initial moisture content of 80 %( wet basis) to a critical moisture content of 30% (wet basis). The constant drying rate was 0.2 kg H20/M2s). Determine the time required for the grains to begin falling drying rate period. The exposed side of the grains is 0.5 cm by 0.5 cm sides and the grains density is 950 kg/m3. (10 Marks)

**QUESTION THREE (20 MARKS)**

1. In Kenya grain weevil attack many types of grains and causes high losses. Discuss the process by which the weevil attacks the grains and the best methods to control them

(10 Marks)

1. Name and discuss five equipment that are used to hoist grains in storage facilities

 (10 Marks)

**QUESTION FOUR (20 MARKS)**

1. Discuss the following factors as they affect grains during storage:
2. Moisture content
3. Temperature (10 Marks)
4. Discuss five methods that are used to control storage insect without use of chemicals and compare them with chemical alternatives. (10 Marks)