FACULTY OF SCIENCE

DEPARTMENT OF FOOD TECHNOLOGY
NATIONAL DIPLOMA

MODULE FOOD PROCESS ENGINEERING 2
FTN3BE2

CAMPUS DFC

EXAM November 2014

DATE: 07 November 2014 **SESSION** 14:00

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INTERNAL MODERATOR PROF. K JALAMA

DURATION 3 HOURS **MARKS** 100

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INSTRUCTIONS: ANSWER ALL THE QUESTIONS.

QUESTION 1

Explain the following:

1.1 Batch processes **(5)**

1.2 Continuous processes **(5)**

1.3 Mixed processes **(5)**

[15]

QUESTION 2

Consider the simple case of a thermostatat, electrically heated laboratory water bath in Figure 1.

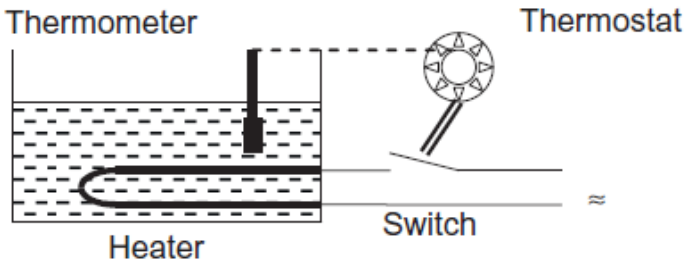

Figure 1

Assume that the control objective is to maintain the temperature of the bath at 37°C. We set the thermostat knob of the bath to 37°C and turn the heater on. A thermometer measures the temperature of the water. When the temperature of the water exceeds 37°C, the thermostat turns off the heater automatically. The temperature of the water drops. When the temperature drops below 37°C, the thermostat turns on the heater automatically, and so on.

Explain the process control of this concept.

[22]

QUESTION 3

In order to ensure ongoing control of food safety, the prerequisite programmes, HACCP and safe design processes need to work together as a cohesive system.

Explain the keys points to ongoing control of food safety.

[12]

QUESTION 4

The economic construction and efficient operation of a process unit will depend on how well the plant and equipment specified on the process flow-sheet is laid out.
A detailed account of plant layout techniques cannot be given in this short section.
Explain the principal factors to be considered.

[21]

QUESTION 5

The multiplicity of uses for water in the food industry (cleaning, blanching, sterilization, cooling and steam generation for power process heating and direct in-process use) calls for enormous quantities of this commodity.

Explain the classification for water used in the food and beverage industries.

[12]

QUESTION 6

Refrigeration systems are essential for the production, storage and distribution of chilled foods.
Discuss the commonly used refrigerants in these systems (chlorofluorocarbons and hydrofluorocarbons).

[18]

TOTAL 100