UNIVERSITY OF JOHANNESBURG

FACULTY OF SCIENCE

DEPARTMENT OF FOOD TECHNOLOGY

NATIONAL DIPLOMA

MODULE **Process Engineering FTN1PE2**

Food Process Engineering 2-FTN3BE2

CAMPUS **DFC**

Main EXAM **01-11-2019**

DATE: 01-11-2019 **Start Time: 12-30**

VENUE: DFC Q/K BUILDING G300

ASSESSOR **Edouard Malenga Ntumba**

INTERNAL MODERATOR **MS N BALOYI**

DURATION **3 HOURS** **MARKS** **100**

NUMBER OF PAGES: 3 PAGES

INSTRUCTIONS: ANSWER 5 QUESTIONS OF CHOICE AND TICK IN THE TABLE BELOW

Q1	Q2	Q3	Q4	Q5	Q6

Students can used calculators.

No to exchange

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1 It is known that during the processing of food, the manufacturing process starts with raw materials and ends with products and by-products ready for consumption. Since each step of transformation is characterized by several actions that can be grouped into a relatively small number of operations governed by the same basic principles [20]

1.1 List all the groups developed in the cadre of the present module

1.2 From each group give and explain at least 2 correspondings unite operations of choice by supporting it with an example

2 Two basic control structures exist to monitor the process in order to satisfy operating conditions: "Feedback control" and the "Feed-forward control". [20]

2.1 Explain with the used of schematic diagrams when each of them is applied to pasteurization of whole milk in which the temperature has to be monitored in order to be maintained constant at the pasteurization temperature

2.2 Compare the two control structure by giving the advantage and disadvantage of each case.

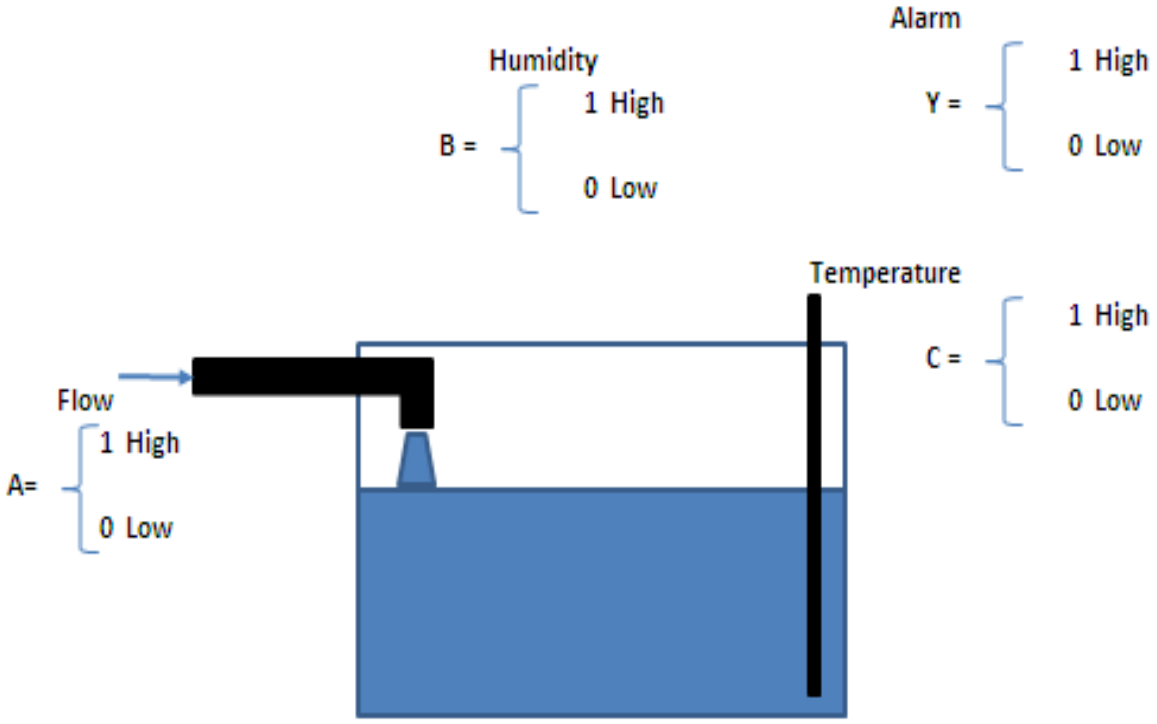
3 The storage tank below is being filled with a liquid. The flow of the liquid is labeled A, the humidity of the environment is labeled B, and the temperature of the liquid is labeled C. Set points have been established for these variables, and depending on whether the variables are above or below the set points, a digit 1 or 0 is assigned to each variable, in order to develop the Boolean expression for the system.

It is necessary to sound an alarm when certain parameters exceed specifications. When the Boolean variable Y goes to the 1 state, an alarm will be activated.

The conditions for turning on the alarm are:

1. Low flow with High temperature;
2. Low flow or low humidity;
3. High flow with low humidity or High temperature.

The final condition to activate the alarm is
Condition 1 or Condition 2 and Condition 3
[20]



4 Give different categories of materials handling equipment and for each give the characteristics based on the followings: direction, frequency, location to serve, service nature, movement depending on the height and material status [20]

5 In order to develop a HACCP system, a food company applies the Codex HACCP principles to its operations. [20]

5.1 Enumerate all the steps to go through in the development a HACCP system

5.2 Elaborate on two steps of your choice

6 The location of the plant can have a crucial effect on the profitability of a project, and the scope for future expansion.

6.1 Give the principal factors to consider during the establishment of a food plant

6.2 Discuss or elaborate at least about 2 factors of your choice

Good luck