UNIVERSITY OF ESWATINI

RE-SIT EXAMINATION PAPER

PROGRAMME	:	BACHELOR OF SCIENCE IN FOOD SCIENCE, NUTRITION AND TECHNOLOGY YEAR IV
COURSE CODE	:	FSNT 410/FNS410
TITLE OF PAPER	:	PROCESS CONTROL AND AUTOMATION
TIME ALLOWED	:	TWO (2) HOURS
INSTRUCTIONS	:	ANSWER QUESTION ONE (1) AND ANY OTHER TWO (2) QUESTIONS.

DO NOT OPEN THIS PAPER UNTIL PERMISSION HAS BEEN GRANTED BY THE CHIEF INVIGILATOR

QUESTION 1 (COMPULSORY)

(a) Discuss the process Control Loop Design Criteria **(20 Marks)**

(b) Explain the functions of actuators and final control elements. Give an example for each in food process operations. **(20 Marks)**

[TOTAL MARKS = 40]

QUESTION 2

(a) Discuss the functions and principle of thermocouples. **(12 Marks)**

(b) With the help of sketches, describe the different types of on-off control systems. **(18 Marks)**

[TOTAL MARKS = 30]

QUESTION 3

(a) Write short notes on the following:

i. Automatic tuning
ii. Variable type transducers
iii. Settling time
iv. Event based control

(4 x 5 = 20 Marks)

(b) Explain the working principle of resistive transducers. Give examples of their application in food process operations. **(10 Marks)**

[TOTAL MARKS = 30]

QUESTION 4

(a) Describe pressure type level measurement technique (include a sketch). (14 Marks)

(a) Describe four (4) important stages of E-nose signal processing and pattern recognition. (16 Marks)

[TOTAL MARKS = 30]