UNIVERSITY OF SWAZILAND

SUPPLEMENTARY EXAMINATION PAPER

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

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QUESTION 1 [COMPULSORY]

(a) Explain the working principle of thermocouples and resistance temperature detectors. **(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 advantages and disadvantages of process automation. **(15 Marks)**

(b) With the help of sketches, describe the different types of control valves. **(15 Marks)**

[TOTAL MARKS = 30]

QUESTION 3

(a) Describe the principle of radiation thermometer and explain why its use was limited in the food industry. **(15 Marks)**

(b) Describe **five (5)** reasons for automation. **(15 Marks)**

[TOTAL MARKS = 30]

QUESTION 4

(a) Describe a float type level measurement technique (use sketch). **(15 Marks)**

(b) Make a distinction between servo and regulation activities. **(15 Marks)**

[TOTAL MARKS = 30]