UNIVERSITY OF SWAZILAND

FINAL 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) Identify and describe the essential elements of a process control. **(16 Marks)**

(b) Describe the principle behind a resistive transducer and give an example of such a transducer. **(10 Marks)**

(c) Describe capacitance method of level measurement. **(14 Marks)**

[TOTAL MARKS = 40]

QUESTION 2

(a) Describe programmable and flexible automation. **(20 Marks)**

(b) Make a distinction between event-based and time-based sequential control. **(10 Marks)**

[TOTAL MARKS = 30]

QUESTION 3

(a) Describe in detail how a feedback control structure works. **(10 Marks)**
(b) Describe the principle behind a piezo electric device. **(10 Marks)**
(c) Explain how a strain gauge works and suggest how it could be used (integrated) in a food processing operation for automation and control. **(10 Marks)**

[TOTAL MARKS = 30]

QUESTION 4

(a) Discuss proportional control using an appropriate example. **(15 Marks)**

(b) Explain how a chemo resistive e-nose works. **(15 Marks)**

[TOTAL MARKS = 30]