



2<sup>nd</sup> SEM. 2017/18

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**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.**

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

**QUESTION 1 (COMPULSORY)**

- (a) Discuss feedback and feed forward control. (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 purpose and principle of strain gauges. (15 Marks)
- (b) With the help of sketches, describe the different types of on-off control systems. (15 Marks)

[TOTAL MARKS = 30]

**QUESTION 3**

- (a) Describe the different sight type level measuring techniques. (15 Marks)
- (b) List the temperature measuring techniques and discuss any two further. (15 Marks)

[TOTAL MARKS = 30]

**QUESTION 4**

- (a) Describe pressure type level measurement technique (include a sketch). (15 Marks)
- (b) Describe the different automation strategies. (15 Marks)

[TOTAL MARKS = 30]