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**UNIVERSITY OF SWAZILAND**

**FINAL EXAMINATION PAPER**

**PROGRAMME:** **BACHELOR OF SCIENCE IN FOOD  
SCIENCE, NUTRITION AND  
TECHNOLOGY YEAR III**

**COURSE CODE** : **FSNT 302**

**TITLE OF PAPER** : **FOOD MACHINERY AND PLANT  
DESIGN**

**TIME ALLOWED** : **TWO (2) HOURS**

**INSTRUCTIONS** : **ANSWER QUESTION ONE (1)  
AND ANY OTHER (2) QUESTIONS**

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GRANTED BY THE CHIEF INVIGILATOR**

**QUESTION 1 [COMPULSORY]**

Your task is to set up a tomato processing plant in Swaziland. The final product will be canned tomatoes in their own juice and paste.

- a. Describe the composition of your planning team that will be responsible for setting up the processing plant.  
[15 marks]
- b. Discuss factors that will influence the geographic location of the tomato processing plant.  
[15 marks]
- c. Describe the design requirements for the following structures of the tomato processing plant.
  - i. Grounds
  - ii. Floors and drains
  - iii. Walls
  - iv. Windows and sills
  - v. Doors

[10 marks]

**[Total = 40 marks]**

**QUESTION 2**

Some equipment for the tomato processing plant will be fabricated on site and some will be purchased from suppliers

- a. Explain **six** important points you would consider in plate fabrication of processing equipment  
[12 marks]
- b. Discuss **seven** important points to consider when installing the tomato processing equipment.  
[14 marks]
- c. Discuss **four** points that can improve the efficiency in a work centre  
[4 marks]

**[Total = 30 marks]**

**QUESTION 3**

It is your function to identify equipment that will be required for tomato processing. Specify the type of equipment you will need for the following unit operations and explain the principle of operation of each piece of equipment.

- i. Washing of tomatoes
- ii. Sorting out of green and rotten tomatoes
- iii. Size grading of tomatoes
- iv. Peeling of tomatoes
- v. Dicing of tomatoes
- vi. Heat sterilization of canned tomatoes

**[Total =30 marks]**

**QUESTION 4**

Small tomatoes after cleaning are cooked, pulped and some water evaporated to produce a viscous paste. Specify the type of equipment you will need for the following unit operations and explain the principle of operation of each piece of equipment.

- i. Pulping of cooked tomatoes
- ii. Evaporation of water
- iii. Mixing stabilizer into paste
- iv. Aseptic packaging of paste

**[Total = 30 marks]**