



1ST SEM. 2007/2008

PAGE 1 OF 3

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**

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

QUESTION 1 [COMPULSORY]

- a. Describe the responsibilities of each of the following planning team members and also give **three** forms of communication between members.

- i. Administration
- ii. Operations
- iii. Engineering
- iv. Builder

[15 marks]

- b. Describe the design requirements for the following structures in a food processing plant.

- i. Grounds
- ii. Floors
- iii. Walls
- iv. Windows and sills
- v. Doors

[15 marks]

- c. Discuss factors that will influence the geographic location of a food processing plant.

[10 marks]

[Total = 40 marks]

QUESTION 2

- a. Discuss the use of the following materials in the construction of food processing equipment.

- i. Wood
- ii. Aluminum
- iii. Cold rolled steel
- iv. Cast iron
- v. Stainless steel

[10 marks]

- b. Discuss the design requirements for the following structures in the construction of a food processing line.

- i. Fastening
- ii. Pipelines
- iii. Tanks
- iv. Supporting frames

[8 marks]

- c. Discuss six important points to consider in plate fabrication and six important points to consider when installing processing equipment.

[12 marks]

[Total = 30 marks]

QUESTION 3

- a. Discuss three types of plant layout. [6 marks]
- b. Describe the principle of operation and usage of the following equipment in the processing of food.

- i. Brush washer and air classifier
- ii. Roller mill and pressure homogenizer
- iii. Multideck flat bed screen and colour sorter
- iv. Abrasion peeling and caustic peeling
- v. Disc bowl centrifuge and basket centrifuge
- vi. Fluidized bed drier and tunnel drier

[24 marks]

[Total = 30 marks]

QUESTION 4

- a. Discuss the importance of plant layout analysis and the three parts in a layout. [10 marks]
- b. Describe the principle of operation and usage of the following equipment in the processing of food.

- i. Vertical short-tube evaporator and elate evaporator
- ii. Plate heat exchanger and concentric tube heat exchanger
- iii. Continuous hydrostatic sterilizer and cooker cooler
- iv. Z -Blade mixer and ribbon mixer

[20 marks]

[Total = 30 marks]