



1ST SEM. 2012/13

PAGE 1 OF 3

**UNIVERSITY OF SWAZILAND
FINAL EXAMINATION PAPER**

**PROGRAM : 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 TWO (2) QUESTIONS. ILLUSTRATE
YOUR ANSWERS WITH DIAGRAMS
WHERE NEEDED**

QUESTION 1 (COMPULSORY)

- (a) Enumerate factors to be considered in selecting the location of food processing plant. (10 Marks)
- (b) Name hot air dryers and describe the operation of any one of them. (10 Marks)
- (c) List the stages of process design and discuss any one of the stages in detail. (10 Marks)
- (d) Discuss the principles for hygienic design of food processing equipment in contact with food. (10 Marks)

[TOTAL MARKS = 40]

QUESTION 2

- (a) List the steps followed in Clean-in-Place (CIP) systems. (8 Marks)
- (b) Discuss the principle of separation using centrifuges and list the different classes of centrifuges. (10 Marks)
- (c) Describe the different types of valves used in the food processing industry from hygienic design point of view? (6 Marks)
- (d) Compare and contrast blast and chest freezer? (6 Marks)

[TOTAL MARKS = 30]

QUESTION 3

- (a) Explain the advantages of twin screw extruders. (8 Marks)
- (b) Explain how a fluidized bed dryer works. (8 Marks)
- (c) Describe phenomena in falling and rising film evaporators. (8 Marks)
- (d) Name mixers used to mix powdered and particulate foods. (6 Marks)

[TOTAL MARKS = 30]

46

QUESTION 4

- (a) Describe the different types of fans based on the direction of air flow (8 Marks)
- (b) Describe the working principle of a hammer and a disc mill. (8 Marks)
- (c) Explain the working principle of a freeze drier. (8 Marks)
- (d) What are the main components of a sheeting machine? (6 Marks)

[TOTAL MARKS = 30]