



1ST SEM. 2013/14

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**UNIVERSITY OF SWAZILAND
SUPPLEMENTARY 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**

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

QUESTION 1 (COMPULSORY)

- (a) Using diagrams, describe how a disc bowl centrifuge clarifier works. (15 Marks)
- (b) Discuss the issues related to hygienic design of pipes used to transport food materials. (15 Marks)
- (c) Compare and contrast multiple and single use CIP systems. (10 Marks)

[TOTAL MARKS = 40]

QUESTION 2

- (a) Briefly describe the factors influencing the degree of mix in solid-mixing. (15 Marks)
- (b) Make a distinction between single and twin screw extruders and list the advantages of twin screw extruders. (15 Marks)

[TOTAL MARKS = 30]

QUESTION 3

- (a) Write short notes on the following:
 - i. Mixed flow fans
 - ii. Falling film evaporator
 - iii. Attrition mills
 - iv. Relationship charts(4 x 5 = 20 Marks)
- (b) Describe two (2) types of filtration equipment used in the food processing industry. (10 Marks)

[TOTAL MARKS = 30]

QUESTION 4

- (a) With the help of a sketch describe how tunnel driers work. (15 Marks)
- (b) Define membrane processes and discuss two (2) types of membrane designs. (15 Marks)

[TOTAL MARKS = 30]