UNIVERSITY OF ESWATINI
FINAL EXAMINATION PAPER

PROGRAM	:	**BACHELOR OF SCIENCE IN FOOD SCIENCE, NUTRITION AND TECHNOLOGY YEAR II**
COURSE CODE	:	**FNS202**
TITLE OF PAPER	:	**FOOD MACHINERY AND PLANT DESIGN**
TIME ALLOWED	:	**TWO (2) HOURS**
INSTRUCTIONS	:	**ANSWER QUESTION ONE (1) AND ANY OTHER TWO (2) QUESTIONS**

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QUESTION 1 (COMPULSORY)

(a) Describe the purpose of process design and outline the steps involved. **(10 Marks)**

(b) Describe **three (3)** issues related to functional area design of a food processing plant. **(15 Marks)**

(c) State the requirements in food machinery design. **(15 Marks)**

[TOTAL MARKS = 40]

QUESTION 2

(a) Define membrane processes and discus **two (2)** types of membrane designs. **(10Marks)**

(b) Explain the following: **(4x5=20 Marks)**

i. Blast freezer
ii. Gauge rolls
iii. Atomization
iv. Centrifugal fans

[TOTAL MARKS = 30]

QUESTION 3

(a) With the help of a sketch, describe how pneumatic conveying works. **(10 Marks)**

(b) With the aid of a sketch, describe the drum dryer and the principle of the drying process using drum dryer. **(10 Marks).**

(c) With the help of a sketch, describe how a continuous screw press works and indicate its application in food processing. **(10 Marks)**

[TOTAL MARKS = 30]

QUESTION 4

(a) Define extrusion process and describe the different sections of an extruder **(10 Marks)**

(b) State the factors that influence the degree of mix in liquid and solid mixing. **(14 Marks)**

(c) Using diagrams, describe how a disc bowl centrifuge clarifier works. **(6 Marks)**

[TOTAL MARKS = 30]