UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER

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

COURSE CODE : **FSNT 408**

TITLE OF PAPER : **FOOD PACKAGING & TRANSPORTATION**

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

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

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QUESTION 1 (COMPULSORY)

(a) Define packaging and explain **five (5)** functions of food packaging.

(12 Marks)

(b) A manufacturer has produced 4800 units of 450 g canned peach slices in syrup. According to the sampling plan 6 units (n = 6) must be sampled and the acceptance number is 1. The net weight results were as follows: 450, 440, 418, 460, 470, and 465 grams.

Nominal quantity in grams and millilitres	Tolerable negative error	
	As a percentage of nominal quantity	g or ml
5 to 50	9	-
from 50 to 100	-	4.5
from 100 to 200	4.5	-
from 200 to 300	-	9
from 300 to 500	3	-
from 500 to 1,000	-	15
from 1,000 to 10,000	1.5	-
from 10,000 to 15,000	-	150
above 15,000	1	-

State each of the **three (3)** packer's rules and using the table above and by calculation demonstrate if each of the rules is satisfied or not. Should the lot be accepted or rejected?

(15 Marks)

(c) Explain **one (1)** major strength and **two (2)** weakness of the following single films:-

i. Low density polyethylene (LDPE)
ii. Polyimide (nylon)
iii. Ethylene vinyl alcohol (EVOH)

(9 Marks)

(d) Differentiate between modified atmosphere packaging (MAP) and controlled atmosphere packaging (CAP) giving **one (1)** application example in each case.

(4 Marks)
[TOTAL MARKS = 40]

QUESTION 2

(a) What is active packaging? Give **three (3)** examples under the following:

i. Gas control
ii. Moisture
iii. Microbial control

(8 Marks)

(b) Explain the process for manufacturing the following glass packaging:

i. Glass bottles for beer
ii. Glass jars for marmalade jam

(10 Marks)

(c) Give **One (1)** advantage and **two (2)** disadvantages of the following single films?

iv. Low density polyethylene (LDPE)
v. Polyimide (nylon)
vi. Ethylene vinyl alcohol (EVOH)

(9 Marks)

(d) Explain how laminated films are manufactured.

(3 Marks)
[TOTAL MARKS = 30]

QUESTION 3

(a) Explain the following manufacturing processes for rigid and semi-rigid plastic containers:-

i. Thermoforming
ii. Injection moulding
iii. Stretch blow moulding

(10 Marks)

(b) Describe the following types of shipping containers. Give a food product example that could be shipped in each type of container.

i. Dry container
ii. Insulated container
iii. Reefer container

(9 Marks)

(c) Explain **three (3)** functions of an in-transit refrigeration unit.

(6 Marks)

(d) Explain the function of the additives, pigments and resin in paper manufacturing.

(5 Marks)
[TOTAL MARKS = 30]

QUESTION 4

(a) Name and explain the following processes for manufacturing the following two piece cans:-

i. Carbonated soft drink cans
ii. Jam cans

(14 Marks)

(b) Discuss a process for manufacturing paper from cellulose fibre derived from wood chips.

(8 Marks)

(c) Explain how the following product characteristics affect logistic costs:-

i. Volume to weight ratio
ii. Value to weight ratio

(8 Marks)

[TOTAL MARKS = 30]