

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN FOOD SCIENCE AND TECHNOLOGY

FOST 461: PACKAGING, STORAGE AND DISTRIBUTION OF FOODS

STREAMS:

TIME: 2 HOURS

DAY/DATE: FRIDAY 24/09/2021
A.M

8.30 A.M – 10.30

INSTRUCTIONS

- Answer all questions in section A and any two questions in section B

SECTION A

1. Explain aseptic packaging and state its advantages over traditional thermal sterilization.

[6 marks]

2. By use of examples differentiate between reuse and recycling under sustainable food packaging. [4 marks]

3. Describe the roles played by food packaging. [8 marks]

4. (a) The oxygen transmission rate of PET film with 0.1 cm thickness is $0.41 \text{ cm}^3 \text{ cm}^{-2} \text{ s}^{-1}$. The partial pressure difference (∇P) through the film is 21278 Pa. What is the oxygen permeability coefficient of the film? [2 marks]

(b) A food stored in a PET jar with a wall thickness of 0.1 cm and a surface area of 400 cm^2 becomes rancid if it absorbs 3 cm^3 of oxygen. The oxygen

permeability coefficient of PET is $1.2 \times 10^{-15} \text{ cm}^3 \cdot \text{cm} \cdot \text{cm}^{-2} \cdot \text{Pa}^{-1}$. The oxygen vapour pressure inside the container (P_i) was 0 pa and outside the container (P_o) was 21278 Pa. Calculate the shelf life of this product.

[3 marks]

5. Describe the process of making a three piece can. [7 marks]

SECTION B

6. (a) Proper waste management is important to protect human health, the environment and to preserve natural resources. Discuss sustainable food packaging with respect to recycling of food packaging materials.

[16 marks]

(b) Discuss the general properties of polyethylene terephthalate (PET) as a food packaging material and give examples of where its applied. [4 marks]

7. (a) By giving examples, describe types of papers and their applications in food packaging. [12 marks]

(b) Define glass and explain its advantages and disadvantages as a food packaging material. [8 marks]

8. (a) Name and describe the properties of agents used in active packaging in food processing. [14 marks]

(b) State types of metals used in food packaging and their general properties. [6 marks]
