

**CHUKA**



**UNIVERSITY**

**UNIVERSITY EXAMINATIONS**

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

**FOST 241: FOOD PROCESSING AND PRESERVATION**

**STREAMS: B.SC FOST Y3S2**

**TIME: 2 HOURS**

**DAY/DATE: WEDNESDAY 08/04/2020**

**8.30 A.M. – 10.30 A.M.**

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**INSTRUCTIONS:**

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

**SECTION A**

1. Discuss geometric properties of raw food materials and its relevance with respect to food processing. (5 marks)
2. Describe the mechanisms by which raw food materials deteriorate. (5 marks)
3. (a) Microbial inactivation by thermal processes follows first order reaction kinetics.
  - (i) Use a diagram to illustrate the relationship between the population of microorganisms and time at a constant heating. (2 marks)
  - (ii) Explain the term, D-value. (2 marks)
- (b) A soup with an organism with a  $D_7$  value of 10 s, is heated for 60 s at  $70^{\circ}C$ . Calculate percentage microorganisms population remaining after the heat treatment. (2 marks)
4. (i) Explain the importance of sulphiting of fruits and vegetables in food processing and name two permitted sulphiting agents. (6 marks)
- (ii) Outline sulphiting agents chemistry of action. (2 marks)

5. (a) Justify the reasons for increased research into so called ‘nonthermal’ preservation methods. (2 marks)
- (b) Describe the following terms
- (i) Pulsed Electric Field Processing (2 marks)
- (ii) Extrusion (2 marks)

**SECTION B**

6. (a) Describe the general effects and mechanisms of irradiation in food processing. (12 marks)
- (b) State the advantages of high pressure processing of foods. (8 marks)
7. (a) Outline the steps snack food manufacturers use to produce traditional crisps. (10 marks)
- (b) Discuss the mechanisms and purposes of blanching during vegetables processing. (10 marks)
8. (a) Explain the key steps with respect to preliminary operations during in-container sterilization of food products. (14 marks)
- (b) Discuss challenges associated with use of evaporators and how they can be overcome. (6 marks)
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