

B.E (FTBE) SECOND YEAR, SECOND SEMESTER EXAMINATION 2025

PRINCIPLES OF FOOD PRESERVATION-II

Time: 3 hrs.

Full Marks : 100

PART- I (50 MARKS)

ANSWER Q1 AND ANY TWO FROM THE REST

Q1. Fill in the blanks:

10 × 1 = 10

- a. Emulsifiers must be addedto oil and aqueous phases for emulsion formation.
- b. Desiccated coconut flakes packaged inside a plastic pouch must have.....as an additive.
- c. Bananas turn black when cut but can be prevented by addition of.....
- d. Choice of an emulsifier is primarily based on it's.....
- e. Choice of an antimicrobial agent as a food additive is primarily dictated by
- f. The only chemical allowed in cooking oils for prevention of rancidity is.....
- g. A marathon runner during refreshment breaks is likely to consume a very harmful substance known as.....
- h. sweetener cannot be added to a cup of tea any longer because it is known to be health hazardous.
- i. Your neighborhood tubewell water is very likely to be contaminated with.....neurotoxin.
- j.type of surfactants are preferred for food industries.

Q2. Explain the following (any 4):

4 × 5 = 20

- a. Packaged coconut flakes are not prone to mold attack.
- b. Baby bottles must be manufactured and used with care.
- c. Few bacteria can also preserve food.
- d. Citric acid has multiple roles as a food additive.
- e. Concerns in long-term usage of PET bottles for drinking water.

Q3. Explain the following:

- a. Factors to be considered in selecting an emulsifier for use in food products (provide appropriate examples). What is the role of emulsifiers in chocolate making? **8 + 4**

OR

- b. Factors to be considered in selecting an antimicrobial agent for use in food products (provide appropriate examples). What are the roles of 'nitrites' and 'sulphites' as antimicrobials? **8 + 4**
- c. For food products subjected to microwave heating in 'Porcelain' and 'Metal' containers, what concerns do you have regarding food additives? **4 + 4**

Q4. Distinguish between with examples (any 4):

4 × 5 = 20

- a. Flavoring agents vs. Flavor-enhancing agents
- b. Humectants vs. Anticaking agents
- c. Enrichment vs. Fortification
- d. Firming agent vs. Release agent
- e. Leavening agent vs. Bulking agent

[Turn over

B.E. FOOD TECHNOLOGY AND BIOCHEMICAL ENGINEERING**THIRD YEAR FIRST SEMESTER EXAM 2025****PRINCIPLES OF FOOD PRESERVATION – II**

Time: 3 hrs.

Full Marks : 100

Part – II (50 Marks)**Answer Q1 and any three from the rests (5 + 15x3=50)**

1. (a) What do you mean by 'expansion ratio' in reference to food extrusion process ?
 (b) Why extrusion is called 'HTST' process ?
 (c) What is the difference between side seam and end seam of a can?
 (d) What is the function of expansion rings present on the lid of a can ? 2 + 1 + 1 + 1

2. What do you mean by 'commercial sterility' ? What is TFS can ? Show the can wall composition layer by layer for both TFS and Tin plate cans. Draw a neat sketch of 'double-seam arrangement in metal cans and label properly. 2 + 2 + 6 + 5

3. Classify food items in terms of pH and give example for each class. Differentiate between 'two-piece' and 'three-piece' cans? What are 'A R can' and 'S R can' ? Write the steps of a vegetable canning process . Write the names of different machineries used in canning industry. 3 + 3 + 3 + 3 + 3

4. (a) During the thermal processing, $D^{121.1}$ value of the target organism was found to be 0.22 minute. Find out the time required for 99.999% inactivation of the target organism at 121.1°C (in min.) .
 (b) D_{121} for *C. botulinum* spores is 0.2 min. Find the time required to reduce the spore count from the 10^{12} to one spore at 121°C ? 7.5 + 7.5

5. What is extrusion ? With a neat sketch explain the principle of action of an single screw extruder. Why are extruded materials usually so porous ? What do you mean by twin-screw extrusion ? 2 + 8 + 3 + 2

6. Write the advantages and disadvantages of extrusion . Mention applications of extrusion. What are the extrusion process parameters which control the characteristics of products? Explain how those process parameters (any two) can affect the product's bulk density, moisture content, rehydration ratio and expansion ratio. 3+2+2+ 4 x 2