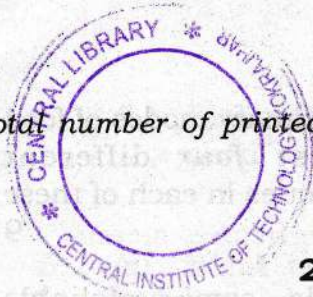


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53 (FPT 302) PFPP

2019

**PRINCIPLES OF FOOD PROCESSING
AND PRESERVATION**

Paper : FPT 302

Full Marks : 100

Time : Three hours

**The figures in the margin indicate
full marks for the questions.**

Answer **any five** out of the **six** questions.

1. (a) Define *D*-value. Derive its mathematical derivation : 2+8=10

$$D = \frac{t}{\log n_t - \log n_o}$$

- (b) Elaborate on the operational principles of a simple batch retort. Discuss with a schematic diagram. 10

Contd.

2. (a) Discuss the *three* primary modes of food preservation. List *four* different preservation techniques in each of these *three* modes. 9
- (b) Discuss perishable, semi-perishable and non-perishable foods with examples for each of them. 6
- (c) Write short notes on **any two** of the following: 2.5×2=5
- (i) Water activity
- (ii) Intermediate Moisture food
- (iii) Freezer burn.
3. (a) Describe the working principle of HTST pasteurization using a simple schematic diagram. 8
- (b) Elaborate on different techniques of minimal processing of fruits and vegetables. Briefly elaborate on flat souring defects of canned foods. 10+2=12
4. (a) Describe the working principles and process parameters of a continuous hydrostatic retort using a schematic diagram. 12

- (b) Elaborate on different types of freezers used in food freezing. 8
5. (a) What is Hurdle technology? Explain with examples. What is the principle of freeze-drying? What is its significance? 4+2+2=8
- (b) Describe the different biochemical causes of deterioration in food. Give examples. 5
- (c) Elaborate on *three* different dosages of irradiation that are applied in food irradiation. Give examples of such food irradiation for the three dosages. 7
6. (a) A milk processing plant needs 79°C thermal processing of their raw milk for 21 seconds. The raw milk carries 4×10^5 cells of a spoilage bacteria, that has a *D*-value of 7 min at 65°C. How many spoilage bacteria will survive after the thermal processing? If same degree of lethality is needed at 65°C, what will be the thermal processing time? 6
- (b) What are the major significance of food preservation? 4

(c) Write short notes on **any four** of the following: $4 \times 2.5 = 10$

(i) Saturated *vs* superheated steam

(ii) Cold chain

(iii) Ultrasonication

(iv) Blanching

(v) Filter sterilization.