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: 4×2·5=10

(i) Saturated *vs* superheated steam

(ii) Cold chain

(iii) Ultrasonication

(iv) Blanching

(v) Filter sterilization.
