



**KERALA AGRICULTURAL UNIVERSITY**  
**B.Tech.(Agrl. Engg.) 2019 Admission**  
**VI Semester Final Examination - June 2022**

Fape.3206

Post Harvest Engineering of Horticultural Crops (1+1)

Marks: 50  
Time: 2 hours

**I Fill in the blanks**

(10x1=10)

1. Flame peeling is mostly used for \_\_\_\_\_.
2. Two types of blanching are \_\_\_\_\_ and \_\_\_\_\_.
3. As the process temperature increases, the thermal death time \_\_\_\_\_.
4. Small size ice crystals are formed during \_\_\_\_\_ freezing method.
5. Widely used drying technique for production of fruit juice powders is \_\_\_\_\_.
6. In cryogenic system of transportation \_\_\_\_\_ is used as refrigerant.
7. An increase in temperature \_\_\_\_\_ the permeability of film.
8. Optimum storage temperature of mango is \_\_\_\_\_.
9. CCP stands for \_\_\_\_\_.
10. Complete flavour and non-volatile resinous fraction present in the spices is known as \_\_\_\_\_.

**II Write short notes on ANY FIVE of the following**

(5x2=10)

1. Briefly explain working of freeze dryers.
2. Peeling methods for different fruits and vegetables
3. D-value and Z-value in thermal processing
4. One ton of tomatoes with initial moisture content of 95% (w.b.) are dried. The final weight of dehydrated product is 100 kg. Determine the amount of moisture removed and final moisture content of product on wet basis.
5. Minimal processing of fruits and vegetables
6. Factors affecting the storage of fruits and vegetables
7. 20000 kg of apples are stored in a cold storage at  $-1^{\circ}\text{C}$ . The initial temperature of apple is  $30^{\circ}\text{C}$ . The specific heat of apple above and below freezing point is  $0.89 \text{ kcal/kg}^{\circ}\text{C}$  and  $0.43 \text{ kcal/kg}^{\circ}\text{C}$  respectively. Freezing point of apple is  $0^{\circ}\text{C}$  and latent heat of fusion is  $60 \text{ kcal/kg}$ . If cooling is achieved in 10 h, calculate the capacity of refrigeration plant.

**III Answer ANY FIVE of the following**

(5x4=20)

1. Importance of freezing and methods of freezing
2. How long would it take to freeze an apple of 10 cm diameter if the cold air at  $-30^{\circ}\text{C}$  blows across it to give heat transfer coefficient of  $100 \text{ W/m}^2\text{K}$ ? The thermal conductivity of frozen apple is  $1.10 \text{ W/mK}$ . The density of apple is  $760 \text{ kg/m}^3$ . Moisture content is 88% and freezing temperature of apple is  $-0.9^{\circ}\text{C}$ . The latent heat of freezing for water in apple is  $293.2 \text{ kJ/kg}$ .
3. Explain theory of drying process. Briefly explain different drying curves.
4. What is active packaging? Briefly explain the functions of scavengers and releasers in an active packaging system.
5. Packaging requirement for fresh cut flower transportation
6. Explain the preservation method by radiation.
7. Explain the post-harvest processing steps for cardamom.

**IV Write an essay on ANY ONE of the following (1x10=10)**

1. List the HACCP principles. Briefly explain the quality control measures in fruits and vegetable processing industry.
2. Explain the canning process for fruits and vegetables.

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