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Ex/M.TECH/FTBE/5102/142/09(OLD)

10. Short notes on (*any three*) :

3x5=15

**MASTER OF TECHNOLOGY (FTBE) EXAMINATION, 2009**  
(1st Semester, Old)

**ADVANCE FOOD PROCESS ENGINEERING**

Time : Three hours

Full Marks :100  
(50 marks for each part)

- i) High pressure processing
- ii) Spray drying.
- iii) Can corrosion.
- iv) MAP & MAC systems.
- v) Processing of juice aseptically.
- vi) Stirred type systallizers.

Use a separate Answer-Script for each part.

**PART-I**

Answer any **three** questions.

All questions carry equal marks.

1. Discuss the different types of freezers available for freezing of food. What type of freezer is suitable for production of Individually Quick Frozen food ? Why glazing is necessary before storage of frozen food ?
2. Discuss the mechanism involved in the inactivation of microorganism by the dense phase carbon dioxide. Discuss a batch dense phase carbon dioxide system for cold pasteurization of food product.
3. Discuss the high pressure processing technology for preservation of food. What are the major advantages of such process ? Compare this process with thermal processing technology.

[ TURNOVER ]

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4. Write short notes on (*any three*) :
- Transportation of chilled and frozen food.
  - Pelican system.
  - Liquid nitrogen freezing of food.
  - Cold chain in frozen food distribution.
  - Ultrasound technique in food processing.
5. What do you understand by freezing rate ? How the frozen food quality is affected by freezing rate ?

Uncooked meat 5 cm thick is being frozen from both sides by a refrigerant at  $-30^{\circ}\text{C}$  in a plate contact freezer. The meat is initially at its freezing point ( $-2^{\circ}\text{C}$ ) but not frozen and has a moisture content of 80%. Determine the time required to freeze the meat.

$$h = \alpha$$

$$K_{\text{frozen meat}} = 11.2 \text{ cal/hr. cm. }^{\circ}\text{C.}$$

$$\rho = 0.96 \text{ gm/cm}^3$$

$$C_p = 0.46 \text{ cal/gm }^{\circ}\text{C.}$$

$$\delta = 0.60.$$

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PART-II

Answer Question No. **6** and any **two** from the rest.

- Pasteurization differs from canning. Explain.
  - Ice cream becomes sandy on storage. Explain.
  - Modified atmospheric storage differs from CA storage.
  - Supercritical extraction differ from solvent extraction.
  - How can freeze drying process be accelerated ?  
5×4=20
7. How do you determine process time in canning by formula method ? When do you get broken heating curve ? How dimensions in cans affect time of processing ? Why sometimes quality of food is affected in high short processing ?  
15
8. Discuss the principle involved in microwave heating of food. How does temperature rise with absorption of energy ? Mention various applications of microwave energy in processing of food ? Indicate safety aspect of microwave heating.  
15
9. Explain the principles involved in extrusion of food. Discuss twin screw extruder. Mention various variables which will control quality of the finished extruded products. What possible biochemical changes may happen in extruded food ?  
15

[ TURNOVER ]