

**P.G. DIPLOMA IN FOOD SCIENCE AND  
TECHNOLOGY (PGDFT)**

**Term-End Examination**

**June, 2013**

**MFT-003 : FOOD PROCESSING AND  
ENGINEERING**

*Time : 2 hours*

*Maximum Marks : 70*

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**Note :** *Attempt any five questions. All the questions carry equal marks.*

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1. What are physical properties of food ? Explain their importance in food storage engineering with suitable examples. **14**
  
2. (a) What is the difference between conduction, convection and radiation ? **4**
- (b) State fourier's law and derive the equation for computing heat through spherical coordinates. **7**
- (c) Explain the thermal conduction in solids, liquids and gases. **3**

3. (a) State the laws of thermodynamics. 3
- (b) A 1 : 3 nitrogen - hydrogen mixture is fed into a reactor where a 21% conversion to ammonia is achieved. The ammonia formed is separated by condensation and the unconverted gases are recycled to the reactor with a fraction continually vented off. The feed contains 0.2 part of argon to 100 parts of nitrogen - hydrogen mixture by volume. The toleration limit for argon entering the reactor is assumed to be 5 parts per 100 parts of the nitrogen - hydrogen mixture by volume. Calculate (i) the fraction of recycle must be continually purged (ii) the overall yield of ammonia per 100 kmol of feed. 7
- (c) Explain the concept of controlled and modified atmospheric storage. 4
4. (a) Explain the criteria for the selection of conveying equipment. List the desirable characteristics of a belt conveyor. Explain the construction and working of belt conveyor. 7
- (b) Explain the major causes of deterioration of perishable foods. What is fumigation ? Give the description of equipments used in fumigation. 7

5. (a) What is D value, F value, Z value and commercial sterilization ? Give the thermal process calculations for canned foods. Explain the concept of microbial inactivation rate at constant temperature. 7
- (b) Calculate the process time for batch sterilization by formula method. 7
6. (a) What is the difference between refrigeration and freezing ? Explain various methods of freezing. Also describe the various types of freezers used in food industry. 7
- (b) What is filtration ? Give details of the methods and equipments used in filtration. 7
7. (a) Explain the effect of mixing on foods. Write the mechanism of the mixers used for liquids of moderate viscosity and mixers used for dry solids. 7
- (b) Give details of high pressure processing, pulsed electric field and ohmic heating of foods. 7
8. (a) Explain the various methods of expressing the liquid from solid - liquid food system. 7
- (b) Give details of the different types, of plant layout. Give the general guidelines for fruit and vegetable processing plant. 7