

**POST GRADUATE DIPLOMA IN FOOD
SCIENCE AND TECHNOLOGY (PGDFT)**

Term-End Examination

00700

December, 2014

MFT-003 : FOOD PROCESSING AND ENGINEERING

Time : 3 hours

Maximum Marks : 70

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

1. (a) Define porosity, surface area and explain their applications for food products. 4
- (b) Explain convection heat transfer. How does it depend on natural convection rates, the physical constants of the fluid, density, viscosity, thermal conductivity, specific heat at constant pressure and coefficient of thermal expansion ? 10
2. (a) Compare wet and dry cleaning. 6
- (b) Show a Thermal Death Time (TDT) curve and illustrate how you will find equivalent killing power at other temperatures (with reference to a specific target organism). 8

3. Write short notes on any **four** of the following :

$$4 \times 3 \frac{1}{2} = 14$$

- (a) Determination of Bulk Density
 - (b) Second Law of Thermodynamics
 - (c) Expression
 - (d) Sorting and Grading in Food Processing
 - (e) Material Handling Equipments
4. (a) An autoclave contains 1000 cans of pea soup. It is heated to an overall temperature of 100°C. If the cans are to be cooled to 40°C before leaving the autoclave, how much cooling water is required, if it enters at 15°C and leaves at 35°C ? The specific heats of pea soup and the can metal are respectively 4.1 kJ kg⁻¹ °C⁻¹ and 0.50 kJ kg⁻¹ °C⁻¹. The weight of each can is 60 g and it contains 0.45 kg of pea soup. Assume that the heat content of the autoclave walls above 40°C is 1.6 × 10⁴ kJ and that there is no heat loss through the walls. Also given specific heat of water = 4.21 kJ kg⁻¹ °C⁻¹. 10

(b) Write a short note on aseptic canning. 4

5. (a) Draw a duly labelled plant layout for a bread unit.

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(b) Fill in the blanks :

7×1=7

(i) _____ homogenizers use high frequency sound waves.

(ii) Pneumatic conveyors are used for _____ fine granular powder of material.

(iii) Hammer mills are widely used for crystalline and _____ material.

(iv) Major food preservation techniques are based on the delay or prevention of microbial _____ .

(v) Moisture is an important factor for storage of _____ .

(vi) Canning is a process in which food materials are _____ sealed in a container.

(vii) Expression is the process of mechanically pressing liquid out _____ solids.

6. (a) What are the factors affecting efficiency of expression of juices from fruits ? 6
- (b) List the different methods of food freezing and describe cryogenic freezing. 8
7. (a) Expand any *seven* of the following : 7×1=7
- (i) RCC
 - (ii) NF
 - (iii) MAP
 - (iv) CAP
 - (v) CNG
 - (vi) UHT
 - (vii) HPP
 - (viii) RO
 - (ix) AGMARK
 - (x) BIS
- (b) Describe the high hydrostatic processing of foods for preservation, with its advantages and limitations. 7
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