

Agricultural & Food Engineering Department, IIT, Kharagpur  
Mid Spring Semester Examination 2013-2014

Degree: M. Tech (FPE) & RS  
Subject: AG60010 Food Process & Product Technology  
Number of students: 29+2=31

Date : -- 02-2014  
Time : 2 Hrs  
Marks: 30

- Q1. Give reasons for the following. [1 x 3 = 3.0]  
i) Vegetables must be blanched prior to freezing- why?  
ii) Commercial sterility of canned foods has no meaning in tropical countries- why? .  
iii) Food materials taken out of the cold store should be consumed as quickly as possible-why?
- Q2. Write working principle / mechanism of action of the following food processing technologies. [1 x 4 = 4.0]  
i) High pressure processing  
ii) Irradiation  
iii) Aseptic processing & packaging  
iv) Hurdle technology
- Q3. Differentiate among the followings. [1 x 4 = 4.0]  
i) Blanching and Pasteurization  
ii) Antioxidants & Sequestrants  
iii) Humectants & Anticaking agents  
iv) Bleaching & Maturing agents
- Q4. Explain the following giving examples. [1 x 4 = 4.0]  
i) 12 D concept in thermal processing  
ii) Commercial sterilization  
iii) Non-nutritive sweeteners  
iv) Intelligent packaging
- Q5. What will happen, why and when  
i) a portion of the fresh milk is allowed to stand undisturbed for a few hours.  
ii) fresh milk is allowed to remain at ordinary temperatures of 15 – 21 °C for 24 hours or longer.  
iii) the rancid flavour that sometimes occur in dairy products  
iv) on boiling fresh milk  
v) 1 g of lactose on bacterial decomposition forms
- Name 4 enzymes present in milk and their functional behaviour. What are the industrial uses of casein? How many numbers of fat globules are there in a drop of milk? [2.5+1+1+0.5]
- Q6. Size of a fat globule is 5 µm. At what speed the fat will try to float in milk having a viscosity of  $3.8 \times 10^{-3}$  PA.s and a density difference of 50 kg m<sup>-3</sup>? What are the effects of homogenization on milk? Why raw milk is not suitable for homogenization?  
What do you mean by Climacteric fruits? How does ethylene ripen fruits? [1+2+0.5+0.5+1]
- Q7. What is the use of colostrum? Discuss the physical state of milk with respect to the size of the constituents. Though perfectly fresh milk contains no lactic acid, then why is milk still acidic? Milk appears entirely opaque while in thin layers it is slightly transparent – why? Defatted milk has yellow colour – why?  
Though fat is not soluble in water, how fat globules remain stable in milk? Discuss the composition of the membrane of a fat globule. [0.5+1+0.5+0.5+0.5+0.5+1.5]

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