

Agricultural & Food Engineering Department, IIT, Kharagpur  
Mid ~~Spring~~ Semester Examination 2010-2011  
*Autumn*

Degree: M Tech (FPE) & RS

Subject: AG60021 Food Chemistry & Microbiology

Number of students: 28+05 = 33

Date: 16-09-2010

Time: 2 Hrs

Marks: 30

Q1. Give reasons for the following. [0.5x4=2.0]

- (i) Why doesn't water and oil separate in salad dressings?
- (ii) Why does salt dissolve in water?
- (iii) Why does bread taste sweet after toasting?
- (iv) Why do food reactions generally conform to the Arrhenius relationship over a certain intermediate temperature range only?

Q2. Differentiate among the following. [1.0x4=4.0]

- (i) Reterogradation and Gelatinization
- (ii) Maillard reaction and Caramelization
- (iii) Amylose & Amylopectin
- (iv) Pectins and Pectinic acids

Q3. Write one chemical additive for each of the following and explain how it works. [0.75x5=3.75]

- (i) Retention of softness in pastry
- (ii) Prevention of enzymatic browning in apples
- (iii) Prevention of sandiness in icecream
- (iv) Clarification of fruit juices
- (v) Improvement of rehydration characteristics of dehydrated vegetables

Q4. Explain how the following lead to the deterioration in quality? [0.75x3=2.25]

- (a) Bruising of fruit (b) Hydrolysis of lipids (c) Heating of muscle tissue

Q5. With the help of suitable diagrams explain how changes in water activity of the product influence following reactions. [1.0x3=3.0]

- (i) Oxidation of lipids in potato chips.
- (ii) Degradation of chlorophyll in green vegetables
- (iii) Destruction of thiamin in rice.

Q6. Differentiate between the following – [1x6 = 6]

- a. Autotrophic and heterotrophic
- b. Biogenesis and abiogenesis
- c. Eukaryotic and prokaryotic cells
- d. Reproduction of yeast and bacteria
- e. Chemical nature of slimes and sheath
- f. Lag phase and period of unbalanced phase

Q7. Write short notes on the following – [1.5x6 = 9]

- a. Alteration in poisoning behavior of food due to processing
- b. Kind, rate and course of spoilage affected by biological structures
- c. Inhibitors produced due to growth of microorganisms
- d. Purification of water for use in food industry
- e. Composition and characteristics of cells during stationary phase
- f. Optical measurement of microbial growth