

Indian Institute of Technology Kharagpur
End Spring Semester Examination 2011-2012

Degree: B. Tech (AgFE) & Dual Degree
Subject: AG33006 Food Science & Technology
Number of students: 47

Date: -04-2012
Time: 3 Hrs
Marks: 50

Note: Answer all questions. Use separate answer scripts for Part - A & Part - B.

Part - A

- Q1. (a) List major non-thermal technologies used for preservation and processing of foods and discuss their advantages over thermal technologies. [3.0]
- (b) Discuss principle of operation, mechanism of action and potential areas of application of the following in food processing & preservation. [3 x 2 = 6.0]
- (i) High pressure processing, (ii) Ultrasonication, and (iii) Nanotechnology.
- Q2. (a) Explain the mechanism of flavor and aroma development in coffee and write a process flow chart for the production of instant tea. [4.0]
- (c) What is chocolate liquor? With the help of a process flow chart describe the technology of milk chocolate manufacture. Also discuss how the melting properties of cocoa butter affect the eating qualities of chocolate. [4.0]
- Q3 (a) What do you understand by (i) Flavour enhancers, and (ii) Non nutritive sweeteners? Name two commonly used chemicals each to (i) Prevent caking, (ii) Extend shelf life, (iii) Improve baking quality, and (iv) Prevent oxidation. [4.0]
- (b) What do you understand by food poisoning? Write different types of food poisoning with examples. Also write manifestation, causative agents and preventive measures for botulism. [4.0]

Group B

- Q1. What are the factors that affect formation of gel of pectin? Give the reaction of Amadori rearrangement. Explain with example Enzymatic browning reaction. [1.5+1.5+2]
- Q2. Define softening point, slipping point, and shot melting point, Reichert Meissl Number, Polenske Number, Kirschner Value, Give a mechanism of oxidative rancidity. [.5X6+2]
- Q3. Discuss the advantages and disadvantages of constituents of ice cream. What does ageing do in ice cream preparation? Draw a schematic view of ice cream freezer. Prepare an ice cream mix containing fat – 10%, serum solids 11%, sugar 15% and stabilizer 0.3%. Use milk containing 6.8% fat, and 9.6% serum solids, cream containing 40% fat and 5.5% serum solids, skim milk powder containing 0.5% fat and 97% serum solids, sugar and stabilizer containing 100% dry matter. [2+1+3+3]

Or

- Q4. A reagent is prepared by dissolving compound A in alcohol and adding 12% HCl. When the reagent reacts with Compound B, it gives a red precipitate in 20 to 30 seconds, whereas compound C precipitates much more slowly after boiling with the reagent for some time. Identify compounds A, B, and C. How is glucose in a biological fluid quantitatively estimated? If amylase gives blue colour with dilute I₂, which colour do you expect amylopectin to give? Discuss the gelatinization phenomenon of starch. Write Amadori rearrangement when glucose is reacting with glycine. If a freshly cut piece of apple is kept in soda water (carbonated), what is your expectation about the colour of apple? Give your explanation. [3+1+1+1½+1½+1]
- Q5. Write short notes on (any four)
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| (i) Crude fiber, | (ii) Caramelization | (iii) Maillard reaction, |
| (iv) Freeze drying | (v) Freezing curve. | [4X1½] |