
B.E. / B.Tech. (Full Time) END SEMESTER EXAMINATIONS, NOV / DEC 2011

AGRICULTURAL AND IRRIGATION ENGINEERING BRANCH

SEVENTH SEMESTER – (REGULATIONS 2008)

AI 9403 – FOOD PROCESSING ENGINEERING

Time: 3 hrs Max Marks: 100

Answer ALL Questions

Part – A (10 x 2 = 20 Marks)

1) Distinguish between catering technology and food technology with suitable examples.
2) What are the different types of blanching?
3) The decimal reduction times D for a spore suspension were measured at several temperatures as follows.

Temperature (°C)	104	107	110	113	116
D (minutes)	24.5	14.5	7.5	4.0	2.2

4) Write the BET isotherm equation.
5) Differentiate sorting and grading with suitable examples.
6) How do the particle size and its distribution affect the brewing time and turbidity in coffee?
7) How is the dosage of a radiation calculated?
8) What is the difference between Saponification value and Iodine value?
9) List out any 8 details found in a food packaging material.
10) What are laminates?

Part – B (5 x 16 = 80 Marks)

11) a) Two food powders A and B are mixed in the ratio 70% and 30% respectively. After mixing, they are stored in sealed containers. The moisture sorption isotherm for these materials is approximated to straight lines as $M_A = 9 + 3\ a_w$ and $M_B = 5 + 5\ a_w$ where M_A and M_B are moisture contents on dry basis and a_w is the water activity. The initial moisture content of the powder A is 11 g of water / 100 g of dry matter and powder B is 6 g of water /100 g of dry matter. Find out the equilibrium water activity. (8)

b) Write a note on thermal process time and the factors affecting it. (8)

12)a) i) What are the objectives of food processing? (8)

ii) Discuss the preparative operations in a food processing industry. (8)

(or)

b) i) Classify the food industries based on raw materials. (8)

ii) Write short notes on Pasteurisation and Sterilisation of foods. (8)

13) a) i) Describe with a neat flow diagram the 2 stage freeze concentration process. (7)

ii) Explain the process of Spray drying with a neat sketch. (9)

(or)

b) i) Explain the various methods of brewing in coffee. Draw neat sketches wherever necessary. (9)

ii) Describe the osmosis and reverse osmosis processes for concentrating a liquid. (7)

14) a) i) Tabulate the various processing methods to preserve food products with examples. (8)

ii) What are the applications of irradiation in food industry? (8)

(or)

b) i) Write short notes on microwave heating and its applications to food industry. Also discuss a microwave oven with a neat sketch. (8)

ii) Explain with a flowchart the solvent extraction process of rice bran oil production. (8)

15) a) i) What are the new trends in packaging? Explain the Modified Atmosphere Packaging. (11)

ii) It is proposed to establish a fruit processing unit in a potential fruit producing region. The capacity and locations of the godowns of that region are as follows.

Godown	Capacity (T)	Co-ordinates (km)
1	34	(101,115)
2	55	(112,157)
3	26	(127,98)
4	66	(133,76)
5	45	(89,102)
6	19	(58, 93)

Find out the location of the proposed fruit processing unit for minimising the transportation cost. (5)

(or)

b) i) Explain in detail the various materials used for packaging and their properties. (8)

ii) Discuss in detail the processing of any fruit / vegetable (8)