Roll No.

B.E. / B.Tech. (Full Time) ARREAR EXAMINATIONS, Apr / May 2019

AGRICULTURAL AND IRRIGATION ENGINEERING

Sixth Semester

AI 8601 Dairy and Food Engineering

(Regulation 2012)

Answer ALL Questions

Max Marks: 100

Time: 3 hrs

Part – A (10 x 2 = 20 Marks)

1) State the law governing the *creaming of milk* with details.

2) Expand – PP, PFA, MMPO, FFS

3) Why is *Clot on Boiling* test done for milk?

4) Differentiate *sweet whey* and *acid whey*.

5) What does F_{250}^{18} denote?

6) Following data were obtained from a thermal resistance experiment conducted on a spore suspension at 111°C. Find the D value.

Time (minutes)	0	4	8	12
Number of survivors	10^6	1.2×10^5	1.4×10^4	1.5×10^3

7) Write a note on *Espresso*.

8) Define *radappertization* with suitable example.

9) List any four applications of nanotechnology in food processing.

10) What is *shrink packaging*?

Part – B (5 x 16 = 80 Marks)
(Question No.11 is Compulsory)

11) a) i) Discuss the various issues to be considered in a rational process to design a food processing industry. (10)

ii) Explain any two International Standards for food safety. (6)

12) a) i) Explain the milk handling and transportation process in India and the problems associated.

(OR)

b) i) Discuss the preservation of milk in Milk Chilling Centre.

13) a) i) Explain in detail how the effluent is treated in a dairy plant and disposed.

(OR)

b) i) Explain the process of butter making on a commercial scale in a dairy industry and the factors responsible for churning. (8)

14) a) i) What are sorption isotherms? Explain the methods to draw them. (8)

ii) A dry food product has been exposed to a 30% RH environment at 15°C for 5 hours without a weight change. The moisture content has been measured and is 7.5 % (wet basis). The product is moved to a 50% RH environment and a weight increase of 0.1 kg/kg product occurs before equilibrium is reached. Determine water activity of the product in the first and second environment. Compute moisture contents of the product on dry basis in both environments. (8)

(OR)

b) i) Enumerate the various causes of food spoilage with examples. (6)

ii) How are sorting and grading done in processing of fruits and vegetables? (10)

15) a) i) An orange juice having 3.5% solids is concentrated to 10 times of its original concentration. The feed rate is 1000 kg/hr. A centrifuge separates out 0.921 m³ of ice. Find out the amount of concentrate produced and also the concentration of solids in ice. If the separation is perfect, find the concentration of the concentrate. (6)

ii) With a neat sketch of an extruder, discuss extrusion cooking with suitable examples (10)

(OR)

b) i) Explain the process of dielectric heating and its applications to food industry along with a neat sketch of a microwave oven. (10)

ii) A tunnel dryer is being designed for drying apple halves from initial moisture content of 70% (wet basis) to final moisture content of 5% (wet basis). An experimental drying curve for the product indicates that the critical moisture content is 25% (wet basis) and the time for constant drying is 5 min. Based on the information provided, estimate the total drying time for product. (6)