

B.Tech.
6th Sem.

Roll No. _____

2022

B.Tech. Food Technology
Semester-VI Examination – 2022
Paper Title: Food Engineering III
Paper Code: BFTC-603

Time Allowed: 3 hr

Maximum marks: 75

(Write your Roll No. at the top immediately on receipt of this question paper)

Section A is Compulsory. Answer any four questions from Section B.

Section A (7x5=35 marks)

- Q1.** Explain the drying of food material with the help of a drying rate curve.
- Q2.** Calculate Reynolds number, if a fluid having viscosity of 0.4 Ns/m^2 and relative density of 900 Kg/m^3 through a pipe of 20 mm with a velocity of 2.5 m/s.
- Q3.** A 500 gram cube of lead is heated from 25°C to 75°C . How much energy was required to heat the lead? The specific heat of lead is $0.129 \text{ J/g}^\circ\text{C}$.
- Q4.** What do you understand by visco-elastic materials? Explain these with the help of RELAXATION and CREEP curves.
- Q5.** Derive the relationship between dry basis and wet basis moisture content of food material.
- Q6.** Distinguish between the working of tunnel dryers and drum dryers along with its advantages and disadvantages.
- Q7.** What do you understand by Rheology? What is its application in food quality measurement?

Section B (4x10=40)

- Q1.** Potatoes with 80 percent moisture content on wet basis are dried to a final moisture content of 10 percent. If we dry 100 kg of potatoes, what is the final weight of the product, and how much water is removed?
- Q2.** What are the different properties of air (with units) shown in a psychrometric chart? Also, describe the properties in brief.
- Q3.** What do you understand by Newtonian and non-Newtonian liquid foods? Explain with the help of suitable examples. How kinematic viscosity is measured?

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Q4. A solution with an initial solid concentration of 10 % is being concentrated in a single effect evaporator to a final solid concentration of 40 % under a vacuum of 40kPa. If the feed rate is 1000 kg/h, find the quantity of water to be removed for concentration.

Q5. Describe the moisture sorption isotherms with a suitable diagram.

Q6. The data for drying of rice grains is shown in the table below. The initial moisture content on dry basis (db) is 30 percent. Find the drying rate of rice grains in kg of moisture / [kg of dry solids . min] at 15 min.

Time (min)	0	5	10	15	20	25
Weight of grains (g)	130	128	125	122	119	116

Q7. How will you determine the following with the help of a typical Texture Profile Curve?

- (i) Cohesiveness
 - (ii) Adhesiveness
 - (iii) Springiness
 - (iv) Gumminess.
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