

Enrollment No./Seat No.:

GUJARAT TECHNOLOGICAL UNIVERSITY
Bachelor of Engineering - SEMESTER - V EXAMINATION - WINTER 2025

Subject Code: 3155102

Date: 17-11-2025

Subject Name: Food Drying, Dehydration and Preservation

Time: 10:30 AM TO 01:00 PM

Total Marks: 70

Instructions

- 1. Attempt all questions.**
- 2. Make suitable assumptions wherever necessary.**
- 3. Figures to the right indicate full marks.**
- 4. Simple and non-programmable scientific calculators are allowed.**

	Marks
Q.1 (a) Define drying and dehydration. Differentiate between them.	03
(b) Explain the importance of drying and preservation in food industry.	04
(c) Describe different methods for determination of moisture content in food materials. Define equilibrium moisture content and hygroscopicity.	07
Q.2 (a) Explain the constant rate and falling rate periods of drying with a neat sketch.	03
(b) Discuss the mechanisms of moisture movement during drying of food products.	04
(c) Derive the mathematical expression for drying rate and explain each term. Define critical moisture content. Explain its significance in drying process.	07
OR	
(c) Explain the heat and mass transfer phenomena occurring during drying with diagram. Explain the concept of drying rate curves and their industrial relevance.	07
Q.3 (a) Classify different types of dryers used in food processing.	03
(b) Explain the construction and working of tray dryer with a neat sketch.	04
(c) Describe the design, working and applications of spray dryer.	07
OR	
(a) Write short notes on: i Drum dryer, ii Fluidized bed dryer.	03
(b) Explain freeze drying and its importance in high-value food preservation.	04
(c) Compare tunnel, rotary and vacuum dryers with respect to working, advantages and applications.	07
Q.4 (a) Define preservation. Explain the principles involved in food preservation.	03
(b) Explain different chemical methods of food preservation.	04
(c) Discuss physical preservation methods such as irradiation, chilling and freezing. Explain the concepts of bound and unbound moisture with examples	07

OR

- (a) Write short notes on: i Hurdle technology, ii Pasteurization. **03**
- (b) Explain the concept and advantages of Modified Atmosphere Packaging MAP. **04**
- (c) Discuss emerging preservation technologies such as high-pressure processing, pulsed electric field and ohmic heating. **07**
- Q.5** (a) Explain the performance parameters of a drying system such as heat efficiency, moisture ratio, and drying rate. **03**
- (b) Discuss the design considerations for selecting a suitable dryer for food materials. **04**
- (c) Explain recent trends in drying technology and automation in industrial dryers. **07**
- OR**
- (a) Write short notes on energy efficiency and environmental aspects of food drying. **03**
- (b) Explain testing and performance evaluation of dryers in food industries. **04**
- (c) Discuss case studies on industrial drying of fruits, vegetables or dairy products. **07**
Discuss the effect of drying on physical and nutritional properties of food materials.
