



KERALA AGRICULTURAL UNIVERSITY
B.Tech.(Food Technology) 2022 Admission
III Semester Final Examination – February 2024

Pafe.2115

Heat and Mass Transfer in Food Processing (2+1)

Marks: 50
Time: 2 hours

- I Answer the following (10x1=10)**
1. Define thermal conductivity.
 2. Define effectiveness of fin.
 3. Define radiation heat transfer.
 4. Define the term mass transfer.
- Fill in the blanks**
5. The units of rate of heat transfer is
 6. All radiations in a black body are.....
 7. The specific heat of a material can be determined by
 8. When heat is transferred from one particle of hot body to another by actual motion of the heated particles, it is referred to as heat transfer by.....
- State True or False**
9. Mass transfer is proportional to the area of contact.
 10. Thermal diffusivity is a physical property of a substance.
- II Write short notes on ANY FIVE of the following (5x2=10)**
1. Define Nusselt number and Prandtl number.
 2. Define the terms absorptivity, reflectivity and transmissivity.
 3. What is fouling in heat exchangers?
 4. List the various modes of mass transfer.
 5. What role does radiation play in food processing?
 6. What is the purpose of blanching in food processing, considering heat and mass transfer?
 7. Explain the importance of thermal processing in food preservation.
- III Answer ANY FIVE of the following (5x4=20)**
1. State and derive Fourier's law of heat conduction equation.
 2. Explain the significance of heat transfer mechanisms (conduction, convection, and radiation) in food processing. Provide examples of each mechanism's application.
 3. What is the use of heat exchanger? Mention the different types of heat exchangers.
 4. Explain the concept of view factor and its role in radiation heat transfer between surfaces.
 5. Describe the role of heat exchangers in food processing. Provide examples of their applications and how they contribute to energy efficiency.
 6. Describe the concept of emissivity in the context of radiation heat transfer.
 7. Explain the concept of convection heat transfer. Provide examples of natural and forced convection.
- IV Write an essay on ANY ONE of the following (1x10=10)**
1. Explain the condensation mechanism.
 2. Mention the applications of mass transfer in food and dairy industry.
