Reg. No. : | | | | | | | | | | | | |

Question Paper Code:UA107

B.E./B.Tech. DEGREE EXAMINATION, NOV 2024

Professional Elective

Agricultural Engineering

21AGV107-EMERGING TECHNOLOGIES IN FOOD PROCESSING

(Regulations 2021)

Duration: Three hours Maximum: 100 Marks

Answer All Questions

PART A - (10 x 1 = 10 Marks)

1. What is common application of ohmic heating in food industry? CO1-U

   (a) freezing fruits (b) drying grains

   (c) pasteurizing liquids (d) fermenting vegetables

2. Electromagnetic waves used in food processing include CO1-U

   (a) gamma rays (b) sound waves (c) ultrasound (d) magnetic pulses

3. What is a key characteristic of PEF processing? CO1-U

   (a) High Temperature (b) Non-thermal (c) Radiation (d) Fermentation

4. PEF is primarily used for the sterilization of what? CO1-U

   (a) Textiles (b) Packaging materials (c) Glass (d) Wood

5. A key advantage of freeze drying: CO1-U

   (a) Increases moisture content (b) Retains nutritional value

   (c) Adds artificial flavors (d) Increases fat content

6. Aseptic processing in food involves:

   (a) Freezing (b) Sterilizing both food and packaging separately

   (c) Cooking in an oven (d) Canning

7. Name one application of robotics in the food sector. CO1-U

   (a) Quality control (b) Sorting

   (c) Inventory management (d) Market analysis

8. What is use of cloud computing in the food industry? CO1-U

(a) Cooking food (b) Storing and Analyzing data

(c) Designing food labels (d) Managing supply chain logistics

9. How does high pressure freezing affect the size of ice crystals in food? CO1-U

(a) Increases their size (b) Decreases their size

(c) No effect (d) Changes the min to liquid

10. What is a common piece of equipment used in vacuum cooling CO1-U

(a) High pressure chamber (b) Freeze dryer

(c) Vacuum chamber (d) Freeze concentrator

PART – B (5 x 2= 10 Marks)

11. What is the principle behind electromagnetic eating of foods? CO1-U

12. Why is PEF processing considered a non-thermal method? CO1-U

13. What are super critical fluids, and how are they used in the extraction of food compounds? CO1-U

14. How does artificial intelligence contribute to personalized nutrition? CO1-U

15. Explain how high pressure freezing affects the texture of meat compared to traditional freezing. CO1-U

PART – C (5 x 16= 80 Marks)

16. (a) Explain the concept of hurdle technology in food preservation, including its underlying principles and advantages. CO1-U (16)

Or

(b) Explain the principle of ohmic heating including the role of electrical resistance and joule heating CO1-U (16)

17. (a) Detail the applications of light pulses in the sterilization of foods and packaging materials. How do these methods ensure food safety and extend shelf life? CO3-U (16)

Or

(b) Evaluate the potential of non-thermal methods in the future of food processing CO3-U (16)

18. (a) Explain the mechanism of action of the radio frequency electric field In non-thermal food processing and its effect on microbial inactivation. CO1-U (16)

Or

	(b)	Describe how ultrasound waves are utilized in food preservation, including their effects on microbial cells and food quality.	CO1-U	(16)
19.	(a)	Analyze how artificial intelligence is being integrated into food safety protocols and quality assurance. Provide real-world applications.	CO2-U	(16)
		Or		
	(b)	Examine the contribution of big data to optimizing food supply chains and improving decision-making processes. Include case studies or examples.	CO2-U	(16)
20.	(a)	Explain high pressure freezing and how it affects on foods.	CO1-U	(16)
		Or		
	(b)	How vacuum cooling in food processing works. Explain it briefly.	CO1-U	(16)