Name: **Enrolment No:**	

UPES

End Semester Examination, December 2024

Course: Emerging Technologies in Food Processing **Semester: III**

Program: B.Tech. Food Technology **Duration: 3 Hours**

Course Code: HSFT4018 **Max. Marks: 100**

Instructions: Read all the questions carefully.

S. No.	Section A Short answer questions/ MCQ/T&F (20Qx1.5M= 30 Marks)	Marks	COs
Q1	What is the primary goal of using Pulsed Electric Field (PEF) technology in food preservation? a) Microbial inactivation with minimal impact on food quality b) Reducing food temperature c) Enhancing food color and flavor d) Increasing food shelf life	1.5	CO1
Q2	Light pulses and low-dose gamma irradiation are effective techniques for the inactivation of bacteria and fungi in the food processing industry. a) True b) False	1.5	CO1
Q3	Which of the following is true about ultrasound? a) Generates acoustic energy to enhance mass transfer. b) Scrubbing action loosens the dirt particles and cleans the food particles. c) Generates mechanical energy to enhance chemical action on surfaces & scrubbing action loosens the dirt particles and cleans the food particles. d) None of the mentioned.	1.5	CO1
Q4	Which of the following methods refers to the deactivation of microbes in food using electricity? a) Power Ultrasound. b) Pulsed Electric field. c) Hurdle technology. d) All of the mentioned.	1.5	CO1
Q5	Which of the following is correct for the Pulsed Electric field? a) It has been successful in pasteurizing milk, yoghurt, soup etc. b) If there are no air bubbles present or if food has low electrical conductivity, PEF is non-applicable. c) It's a continuous process. It cannot be applied to non-pumpable solid food products. d) All of the mentioned.	1.5	CO1

Q6	Statement 1: In Pulsed Electric field, food is kept between two electrodes and electricity is passed to deactivate microbes. Statement 2: Pulsed Electric field increases shelf life. a) True, False b) True, True c) False, False d) False, True	1.5	CO2
Q7	What is the primary advantage of Pulsed Electric Field (PEF) technology over traditional thermal processing methods? a) Results in faster processing times b) Preserves food quality attributes better than thermal methods c) Enhances food color and flavor d) Requires lower energy consumption	1.5	CO2
Q8	Hannah heats refrigerated rice which has been devoid of moisture and becomes dry. She heats it in a microwave. It gets unevenly heated. What should she do? a) Water should be added for even heating b) She should heat it using equipment that offers conduction or convection c) None of the mentioned d) All of the mentioned	1.5	CO2
Q9	Statement 1: In microwave heating, heat is not applied to the food item. Statement 2: Radiation doesn't even dry whereas microwave heating does. a) True, False b) True, True c) False, False d) False, True	1.5	CO2
Q10	One disadvantage of microwave cooking is that the energy efficiency in this process is less. a) True b) False	1.5	CO2
Q11	Statement 1: Microwave heating helps save electricity. Statement 2: The quality of the product in microwave heating is good hence rejections are less. a) True, False b) True, True c) False, False d) False, True	1.5	CO3
Q12	Microwave heating is good for puffed products. Why? a) The rate of heat transfer is less than the rate of moisture loss. b) The heat transfer in these food items takes place so fast that instead of shrinking of the food items due to loss of moisture content, they stay intact and hence puffed. c) None of the mentioned d) All of the mentioned	1.5	CO5

Q13	Which of the following is NOT a part of the microwave heating system? a) Magnetron b) Anode c) Cathode d) None of the mentioned	1.5	CO3
Q14	HPP is potentially a safe and revolutionary method for preserving and sterilizing food or food products processed under _____. a) very high pressure b) very low pressure c) very low temperature d) D) very high temperature	1.5	CO3
Q15	Radiations are ineffective against _____. a) Viruses b) Bacteria c) Yeasts d) Molds	1.5	CO5
Q16	Ultrasound used for food processing is _____. a) Low power b) High power	1.5	CO4
Q17	Out of these which is an emerging technology? a) Tray drying b) Osmotic dehydration c) Pulsed light processing d) Sun drying	1.5	CO4
Q18	Pulsed electric field processing can only be applied to _____ food.	1.5	CO3
Q19	Which process involves all directional heating? a) Radiofrequency heating b) Microwave heating c) Ohmic heating d) Pulsed electric field	1.5	CO4
Q20	Generally, heat generated depends on some parameters. It is directly proportional to a) Time b) Conductivity c) Voltage d) Distance between plates	1.5	CO5
Section B (4Qx5M=20 Marks)			
Q 1	What is ohmic heating? How the food processing advantageous using this process?	5	CO4
Q 2	What is pulsed light processing? Describe its process for microbial inactivation.	5	CO5
Q 3	Describe the need for emerging processing techniques.	5	CO3

Q 4	What is the importance of high-pressure processing? Describe its process.	5	CO1
Section C (2Qx15M=30 Marks)			
Q 1	Rakesh owns a food processing unit for multiple food products. a) Write down different emerging technologies that can be used for a particular food product (Choose any one food). **(5 marks)** b) Describe the principle and working of four different emerging technologies that can be used for processing that food product. **(10 marks)**	15	CO5
Q 2	Devendra owns a fruit and vegetable processing unit. Answer the following questions: a) Describe the process of pulsed electric field treatment. **(5 marks)** b) Describe the principle and application of cold plasma processing of food. **(10 marks)**	15	CO4
Section D (2Qx10M=20 Marks)			
Q 1	What is ultrasound processing? Describe the different modes of ultrasound processing.	10	CO2
Q 2	Describe the following processing techniques (**2 marks each**): a) Infrared heating, b) Power ultrasound, c) Pulsed electric field, d) Dielectric heating e) Radio frequency heating	10	CO3