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Enrolment No:			
UNIVERSITY OF PETROLEUM AND ENERGY STUDIES End Semester Examination, May 2023			
Course: Emerging Technologies in Food Processing Program: B.Tech. FT Course Code: HSFT 3013 Instructions:		Semester: VI Duration: 3 Hours Max. Marks: 100	
S. No.	Section A Short answer questions/ MCQ/T&F (20Qx1.5M= 30 Marks)	Marks	COs
Q1	XYZ Company takes its customer feedback very seriously. Hence when suggestions such as – food processed product should have minimum lost of actual flavour, no added colour etc., the company planned on shifting to the latest trend in the industry called _____ a) Minimal Optimization b) None of the mentioned c) Minimal Processing d) All of the mentioned	1.5	CO1
Q2	Light pulses and low dose gamma irradiation are effective techniques for 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 Sound Ultrasound? a) Generates mechanical energy to enhance chemical action on surfaces b) Scrubbing action loosens the dirt particles and cleans the food particle c) Generates mechanical energy to enhance chemical action on surfaces & Scrubbing action loosens the dirt particles and cleans the food particle d) None of the mentioned	1.5	CO1
Q4	Which of the following methods refers to deactivation of microbes in food using electricity? a) Power Ultrasound b) Pulsed Electric field	1.5	CO1

	c) Hurdle technology d) All of the mentioned		
Q5	Which of the following holds true for Pulsed Electric field? a) It has been successful in pasteurizing milk, yogurt, soup etc b) If there are no air bubbles present or the if food has low electrical conductivity, PEF is non-applicable c) It's a continuous process. It cannot be applied for 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	In Pulsed Electric field, since no heat is used, the aroma and flavour of food are retained. a) True b) False	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 drying 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.	1.5	CO3

	<p>Statement 2: The quality of product in microwave heating is good hence rejections are lesser.</p> <p>a) True, False b) True, True c) False, False d) False, True</p>		
Q12	<p>Microwave heating is good for puffed products. Why?</p> <p>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</p>	1.5	CO5
Q13	<p>Which of the following is NOT a part of the microwave heating system?</p> <p>a) Magnetron b) Anode c) Cathode d) None of the mentioned</p>	1.5	CO3
Q14	<p>HPP is potentially a safe and revolutionary method for preserving and sterilizing food or food products processed under _____</p> <p>A) very high pressure B) very low pressure C) very low temperature D) very high temperature</p>	1.5	CO3
Q15	<p>Radiations are ineffective against _____</p> <p>A) Viruses B) Bacteria C) Yeasts D) Molds</p>	1.5	CO5
Q16	<p>Ultrasound used for food processing is?</p> <p>a) Low power b) High power</p>	1.5	CO4
Q17	<p>Out of these which is an emerging technology?</p> <p>a) Tray drying b) Osmotic dehydration c) Pulsed light processing d) Sun drying</p>	1.5	CO4
Q18	<p>The principle involved in turbidimetry is the measurement of</p> <p>a) Absorbed light</p>	1.5	CO3

	b) Scattered light c) Emitted light d) Transmitted light		
Q19	Which process involves all directional heating? a) Radio frequency 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	Differentiate between traditional and emerging processing techniques?	5	CO4
Q 2	Why pulsed light technique? 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 of your choice). (5 marks) b) Describe the principle and working of four different emerging technologies that can be used for processing of 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 methods of oscillating magnetic field and cold plasma processing. (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: Infrared heating, Centrifugation, Evaporation, Dielectric heating	10	CO3