LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – **FOOD CHEMISTRY AND FOOD PROCESSING**

FIRST SEMESTER – **NOVEMBER 2024**

PFP1MC02 – UNIT OPERATIONS AND FOOD PACKAGING

Date: 11-11-2024 Dept. No. Max. : 100 Marks

Time: 01:00 pm-04:00 pm

	SECTION A – K1 (CO1)	
	Answer ALL the questions	**(5 x 1 = 5)**
1	**MCQ**	
a)	Phenomenon where water remains liquid even the temperature is below freezing point i). eutectic point ii). supercooling iii). glass transition iv). freezing time	
b)	Nitrosamines, which may form during meat curing, are considered i) Beneficial for flavor development ii) Harmless byproducts iii) Potentially carcinogenic compounds iv) Essential for meat preservation	
c)	An example of non-thermal technology i). cold plasma ii). ohmic heating iii). dielectric heating iv). infrared heating	
d)	What is a typical application of edible packaging? i) Cans for beverages ii) Wrappers for chocolate bars iii) Plastic bottles for juices iv) Metal containers for soups	
e)	In a MAP system, why is nitrogen often used in combination with other gases? i) To promote moisture retention ii) To displace oxygen and prevent oxidation iii) To add flavor to the product iv) To increase the acidity of the food	
	SECTION A – K2 (CO1)	
	Answer ALL the questions	**(5 x 1 = 5)**
2	**Definitions**	
a)	Zeta potential	
b)	Injection curing	
c)	Dielectric heating	
d)	Polysaccharide-based edible film	

e)	Traffic light system in food labels
	SECTION B – K3 (CO2)
	Answer any THREE of the following **(3 x 10 = 30)**
3	Calculate the freezing point of a solution prepared by adding 140 g trichothecin ($C_{19}H_{24}O_5$) to 0.746kg of benzene. The freezing point of pure benzene is 5.5 ºC. The freezing point constant for benzene is 5.12 ºC/m. (Molar mass of trichothecin = 332.39 g/mol).
4	Examine the benefits of high temperature preservation that contribute to the extended shelf life and quality maintenance of food.
5	Diagrammatically represent the working protocol of a. Infrared heating b. Pulsed electric field
6	Prepare a comprehensive tabulation of the various packaging materials used for food, detailing their functions, advantages and disadvantages.
7	Determine the role of smart sensors and indicators in the management of food quality and safety.
	SECTION C – K4 (CO3)
	Answer any TWO of the following **(2 x 12.5 = 25)**
8	Illustrate the concept of boiling point elevation of liquid with a neat diagram.
9	Discuss in detail the working protocol, principle and applications of cold plasma and radio frequency.
10	Illustrate the working protocol of a spray dryer and explain its food applications.
11	Appraise the role of active packaging system in food industry.
	SECTION D – K5 (CO4)
	Answer any ONE of the following **(1 x 15 = 15)**
12	Explain in detail the concept and applications of electric double layer at solid-liquid interface.
13	Appraise the principle and applications of hurdle technology in food preservation?
	SECTION E – K6 (CO5)
	Answer any ONE of the following **(1 x 20 = 20)**
14	Summarize the working protocol and utility of any four types of freezers in food industry.
15	Formulate a detailed analysis of the key components and regulatory requirements for the front label and back label of a food product, considering how each part contributes to the compliance with food labeling standards.
