LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

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

FIRST SEMESTER – **NOVEMBER 2024**

PFP1MC01 – CHEMISTRY OF MACRO AND MICRONUTRIENTS

Date: 08-11-2024 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)	The water content of conventionally dried fruits is around _____. A) 15% B) 5% C) 38% D) 40%	
b)	Which among the following is not a disaccharide? A) Sucrose B) Lactose C) Maltose D) Dextrose	
c)	The disruption of disulfide bonds during denaturation involves the_____. A) oxidation of cysteine residues B) reduction of cysteine residues C) formation of peptide bonds D) breakage of peptide bonds	
d)	Which of the following is a major product of lipid peroxidation? A) Water B) Lipid hydroperoxides C) Carbon dioxide D) Glycogen	
e)	Excessive intake of calcium oxalate in our diet results in _____. A) stroke B) diarrhea C) constipation D) kidney stones	
	SECTION A – K2 (CO1)	
	Answer ALL the questions	**(5 x 1 = 5)**
2	**Define the following**	
a)	Water Activity	
b)	Chirality	
c)	Isoelectric point	
d)	Turbidity point of lipids	

e)	Lipolysis
	SECTION B – K3 (CO2)
	Answer any THREE of the following **(3 x 10 = 30)**
3	Sketch and explain the sorption isotherms and its significance.
4	Describe the hydrolytic reactions of oligosaccharides and their applications in the food industry.
5	Explain the various types of antioxidants and their quenching mechanism on lipids.
6	Discuss the acylation, phosphorylation, sulphitolysis and plastein modification reactions of protein molecule.
7	a) Describe the chemical and functional properties of copper in food. (6 marks) b) Classify enzymes based on their functions. (4 marks)
	SECTION C – K4 (CO3)
	Answer any TWO of the following **(2 x 12.5 = 25)**
8	a) Discuss the structure of water molecule as per Lewis and hybridization concepts. (5 marks) b) Explain the physical and chemical properties of water in detail. (7.5 marks)
9	Describe the functions of any four food gels and its applications in food industry.
10	a) Explain the various types of lipid oxidation reaction. (5 marks) b) Write any two analytical methods used to measure lipid oxidation products. Mention their advantages and limitations. (7.5 marks)
11	a) Describe the various factors affecting the stability of protein molecule. (7.5 marks) b) Explain the various factors affecting the activity of enzymes as a catalyst. (5 marks)
	SECTION D – K5 (CO4)
	Answer any ONE of the following **(1 x 15 = 15)**
12	a) Sketch and explain the phase transition diagram of water. (10 marks) b) Discuss the oxidation and reduction reactions of monosaccharides with suitable examples. (5).
13	Describe the sample preparation, pretreatment and Soxhlet method of extraction of lipids from food sample.
	SECTION E – K6 (CO5)
	Answer any ONE of the following **(1 x 20 = 20)**
14	a) Describe four different types of structural analysis of protein. (10 marks) b) Explain the thermodynamics of protein denaturation reaction. (10 marks)
15	a) Describe the role of endogenous enzymes in influencing the color and flavor of food products with examples. (8 marks) b) Discuss the stability and degradation mechanism of vitamin A and vitamin D. (12 marks)
