LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

FIRST SEMESTER – **APRIL 2023**

PFP1MC01 – CHEMISTRY OF MACRO AND MICRONUTRIENTS

Date: 29-04-2023   Dept. No.   Max. : 100 Marks
Time: 09:00 AM - 12:00 NOON

SECTION A

Answer ALL the questions

1	**Define the following**		**(5 x 1 = 5)**	
a)	Water activity in food.		K1	CO1
b)	Degree of Polymerization in polysaccharides.		K1	CO1
c)	Fire point and flash point of lipids.		K1	CO1
d)	Iodine value.		K1	CO1
e)	Zwitterion.		K1	CO1
2	**Multiple Choice Questions**		**(5 x 1 = 5)**	
a)	The substance which can act both as an acid and base, is called _____ a. amphoteric b. hydrophilic c. hydrophobic		K2	CO1
b)	Modified starches are also called as _____ a. smart starches b. food gels c. native starches		K2	CO1
c)	The enzyme used to hydrolyse a triaglycerol into fatty acids and glycerol is _____ a. lipase b. ligases c. histidase		K2	CO1
d)	The commonly used solvent in the extraction of fat is _____ a. pentane b. petroleum ether c. alcohols		K2	CO1
e)	The plot of solubility against temperature is called as _____ a. solubility curve b. isotherm curve c. temperature curve		K2	CO1

SECTION B

	Answer any THREE of the following in 500 words		**(3 x 10 = 30)**	
3	Illustrate the phase transition diagram of water with a neat graph.		K3	CO2
4	Demonstrate the hydrolytic reactions of oligosaccharides and their applications in food industry.		K3	CO2
5	Outline the chemical and functional properties of any two minerals in food.		K3	CO2
6	a) Choose any two suitable methods for the extraction of lipids. Write the procedures in detail. b) Prepare a di peptide using glycine and alanine. (7+3)		K3	CO2
7	Demonstrate the role of *phenolase, lipoxygenase* and *chlorophyllase* enzymes in food industries.		K3	CO2

	SECTION C		
	Answer any TWO of the following in 500 words		**(2 x 12.5 = 25)**
8	Enumerate the different interactions of ice in the present of solutes.	K4	CO3
9	Illustrate the mechanism of action of non-enzymatic browning in imparting desirable color and flavour to food products.	K4	CO3
10	a. Classify the fatty acids based on degree of saturation and function.	K4	CO3
	b. Describe various structural analysis of Protein. (4.5 + 8)		
11	a. Distinguish between competitive and non-competitive enzyme catalysed inhibition reaction.	K4	CO3
	b. Explain the role of following forces in determining the stability of protein structure. i) Hydrogen bonding ii) dipole-dipole interaction. (6 + 6.5)		
	SECTION D		
	Answer any ONE of the following in 1000 words		**(1 x 15 = 15)**
12	Explain the applications of various food gels in food industries.	K5	CO4
13	Write the modification of protein structure by alkylation, acylation, phosphorylation, and sulphitolysis reaction.	K5	CO4
	SECTION E		
	Answer any ONE of the following in 1000 words		**(1 x 20 = 20)**
14	Summarize the sources, functions, deficiency, stability and mode of degradation of vitamin-A.	K6	CO5
15	a. Construct an equation for the determination of kinetics of enzyme catalysed reaction. b. Write the influence of various factors in determining the oxidative stability of lipids. (10 + 10)	K6	CO5

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