LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

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

SECOND SEMESTER – **NOVEMBER 2024**

PFP2MC01 – TECHNIQUES IN FOOD ANALYSIS

Date: 07-11-2024 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	**True or False**	
a)	Relative error is the absolute difference between the measured value and the true value, divided by the true value.	
b)	Raman spectroscopy is primarily based on the absorption of UV-visible light by molecules.	
c)	High-Performance Liquid Chromatography (HPLC) is commonly used for the separation of heat-sensitive compounds in food analysis.	
d)	Supercritical fluid extraction uses gases like CO_2 above their critical temperature and pressure for extracting components from food samples.	
e)	A pH meter measures the acidity or alkalinity of a solution by detecting the electrical potential difference between two electrodes.	
	SECTION A – K2 (CO1)	
	Answer ALL the questions	**(5 x 1 = 5)**
2	**Definitions**	
a)	Define accuracy in chemical analysis.	
b)	What is atomic absorption spectroscopy?	
c)	Define High-Performance Liquid Chromatography	
d)	What is paper chromatography?	
e)	Define potentiometry.	
	SECTION B – K3 (CO2)	
	Answer any THREE of the following	**(3 x 10 = 30)**
3	Explain the sample selection and sampling plans in ensuring the accuracy of food analysis.	
4	Analyze the differences between UV- Visible and Infra-red (IR) spectroscopy in terms of their principles and applications in food analysis.	
5	Compare the principles, procedures and applications of Gas chromatography (GC) and Thin layer	

	chromatography (TLC) in food analysis.
6	Discuss the role of supercritical fluid extraction in food analysis and evaluate its advantages over traditional solvent extraction methods.
7	Demonstrate the procedure for preparing a buffer solution and describe its importance in potentiometric measurements.
	SECTION C – K4 (CO3)
	Answer any TWO of the following **(2 x 12.5 = 25)**
8	Explain the principle and the applications of NMR spectroscopy in food analysis.
9	Assess the effectiveness of thermal gravimetric analysis(TGA) compared to differential scanning calorimetry (DSC) in determining the thermal stability of food products.
10	Analyze the advantages and limitations of using gel filtration in the separation of protein mixtures in food samples.
11	Critically evaluate the use of a pH meter with a glass electrode for measuring the pH of food samples.
	SECTION D – K5 (CO4)
	Answer any ONE of the following **(1 x 15 = 15)**
12	Explain the principle and application of titrimetric and gravimetric analysis.
13	Develop a comprehensive approach for using ultracentrifugation and membrane filtration to separate and purify protein fractions from a complex food matrix.
	SECTION E – K6 (CO5)
	Answer any ONE of the following **(1 x 20 = 20)**
14	Adapt the following chromatography and electrochemical techniques and explain how they can be used in food analysis. i) Ion exchange and size exclusion chromatography (10) ii) Conductivity meter. (10)
15	i) Compare the structural features of lactic acid and acetic acid using IR (10). ii) Explain the working principle of Mass spectroscopy (10).
