



# LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

**SECOND SEMESTER – APRIL 2023**

**PFP2MC01 – TECHNIQUES IN FOOD ANALYSIS**

Date: 02-05-2023

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) Sodium carbonate is a primary standard solution.

b) Beer Lambert's law can be applied for the higher concentration solution.

c) Flame ionization detector is meant for detecting the presence of Sodium and Potassium ions.

d) Gas chromatography can also be typed as Gas Solid and Gas Liquid chromatography

e) Ultrafiltration technique is performed by using a non-permeable membrane filter.

## SECTION A – K2 (CO1)

Answer ALL the questions

(5 x 1 = 5)

2. Definitions

a) Normality

b) Anti stokes line

c) EMF

d) Roul't's law

e) Differential Thermal Analysis.

## SECTION B – K3 (CO2)

Answer any THREE of the following in 300 words

(3 x 10 = 30)

3. Illustrate the important criteria for selecting the samples from food components and their preparative methods.

4. Calculate the number of fundamental vibrational modes for the following compounds:  
(i) Carbon dioxide, (ii) Water, (iii) Ethylene, (iv) Acetylene and (v) Benzene.

5. Integrate the use of the column and TLC working principles in the separation of the natural pigment Lycopene from the tomato.

6. Implement membrane filtration and gel filtration techniques in food analysis.

7. Articulate the instrumentation and operation of the coulometric and voltametric methods.

## SECTION C – K4 (CO3)

Answer any TWO of the following in 500 words	(2 x 12.5 = 25)
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Answer any TWO of the following in 500 words	(2 x 12.5 = 25)
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| 8. | Classify the various types of errors. How could it be minimized? |
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| 9. | Outline the principle and method of detection of sodium ion in butter sample using ICP analysis. |
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| 10. | Explain the principle and instrumentation of HPLC and GC. |
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| 11. | Correlate the various types of distillation methods used in food analysis. |
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## SECTION D – K5 (CO4)

Answer any ONE of the following in 750 words	(1 x 15 = 15)
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Answer any ONE of the following in 750 words	(1 x 15 = 15)
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| 12. | Explain the principles, types and applications of volumetric and gravimetric analysis. |
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| 13. | Explain the instrumentation of supercritical fluid extraction and isoelectric focusing techniques. Review their applications in food industries. |
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## SECTION E – K6 (CO5)

	Answer any ONE of the following in 1000 words	(1 x 20 = 20)
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	Answer any ONE of the following in 1000 words	(1 x 20 = 20)
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| 14. | (i) Interpret and compare the structural features of lactic and acetic acid based on IR and $^1\text{H}$ NMR analysis. (10) |
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- (ii) Summarize the importance of ESR and UV analysis in food analysis. (10)

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| 15. | Apply the following chromatography and electrochemical techniques and explain how they can be used in food analysis. |
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| (i) | Ion exchange and gel permeation chromatography | (10) |
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|  | (ii) pH and conductivitometric analysis. | (10) |
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