25FTP104/ 23FTP104

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2025
(First Semester)

Branch - **FOOD TECHNOLOGY MANAGEMENT**

INSTRUMENTATION AND ANALYTICAL TECHNIQUES

Time: Three Hours | Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks (10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Name the instrument used to measure water activity in foods. a) Bomb calorimeter b) Aw meter c) pH meter d) Moisture analyzer	K1	CO1
	2	Identify the instrument commonly used for texture analysis of foods. a) Brookfield viscometer b) Texture analyzer c) Hunter colorimeter d) Spectrophotometer	K2	CO1
2	3	Which spectroscopy technique identifies functional groups in molecules? a) UV–Vis b) IR spectroscopy c) NMR d) SEM	K1	CO2
	4	____ is checked by using Hunter color scale. a) pH b) Texture c) Color d) Viscosity	K2	CO2
3	5	Infer how HPLC separates compounds, based on which principle? a) Size exclusion b) Polarity/stationary phase interaction c) Charge d) Sedimentation	K1	CO3
	6	Observe for what purpose GC is most suitable. a) Sugars b) Lipids & volatile compounds c) Proteins d) Polysaccharides	K2	CO3
4	7	Recall the main criterion on which electrophoresis separates molecules. a) Molecular weight b) Electrical charge c) Solubility d) Absorbance	K1	CO4
	8	Extend the use of Supercritical fluid extraction (SFE). a) Milk coagulation b Caffeine removal c) Protein determination d) Viscosity analysis	K2	CO4
5	9	____ is the primary use of E-nose. a) Microbial growth b) Color c) Aroma/volatile compounds d) pH	K1	CO5
	10	_____ is the application of DSC (Differential Scanning Colorimetry) in food analysis. a) Enzyme kinetics b) Thermal transitions c) Microbial load d) Viscosity	K2	CO5

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SECTION - B (35 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Prepare an essay on the working principle and applications of a bomb calorimeter in food analysis.	K3	CO1
		(OR)		
	11.b.	Illustrate the working and applications of pH meter and auto-analyzer in food industry.		
2	12.a.	Analyse the principles, instrumentation, and applications of IR and FTIR spectroscopy.	K4	CO2
		(OR)		
	12.b.	Document the microscopic techniques of SEM and TEM and their role in food analysis.		
3	13.a.	Explain the working principle, instrumentation, and applications of HPLC in food analysis.	K4	CO3
		(OR)		
	13.b.	Examine about GC–MS and LC–MS techniques in food quality analysis with examples.		
4	14.a.	Classify and explain membrane separation techniques with applications in food processing.	K4	CO4
		(OR)		
	14.b.	Infer the working principle and applications of ultracentrifugation and dialysis.		
5	15.a.	Evaluate the principle, instrumentation, and food applications of DSC (Differential Scanning Calorimetry).	K5	CO5
		(OR)		
	15.b.	Estimate the working and applications of E-tongue in food industry.		

SECTION -C (30 Marks)

Answer **ANY THREE** questions

ALL questions carry **EQUAL** Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Outline the role of sensors in food quality analysis and their applications.	K4	CO1
2	17	Relate the applications of NMR spectroscopy in food analysis with suitable examples.	K4	CO2
3	18	Critically analyze various chromatographic techniques and their applications in food industry.	K4	CO3
4	19	Compare gel filtration, electrophoresis, and ultrafiltration techniques used in food processing.	K5	CO4
5	20	Summarize in detail the immunoassay techniques used in food analysis and their significance.	K6	CO5

Z-Z-Z END