PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2025
(First Semester)

Branch – **FOOD TECHNOLOGY MANAGEMENT**

FOOD CHEMISTRY

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	Find the reason that the anomalous properties of water (like high boiling point) are primarily due to: a) Its low molecular weight b) Covalent bonds between molecules c) Extensive hydrogen bonding network d) Its polar covalent nature	K1	CO1
	2	The ionization of water is described by the equation: $H_2O \rightleftharpoons H^+ + OH^-$. At 25°C, the product of the concentrations of H^+ and OH^- ($[H^+][OH^-]$) is: a) 1×10^{-7} M b) 1×10^{-14} M^2 c) pKa = 7.0 d) 14	K2	CO1
2	3	Resistant starch is defined as: a) Starch that is highly resistant to gelatinization. b) The portion of starch that escapes digestion in the small intestine. c) Starch that has been chemically modified to be tougher. d) Starch with a very high amylose content.	K1	CO2
	4	Infer the non-nutritive high-intensity sweetener? a) High Fructose Corn Syrup (HFCS) b) Sorbitol c) Aspartame d) Glucose	K2	CO2
3	5	The primary structure of a protein is defined as: a) The overall three-dimensional shape of a single polypeptide chain. b) The sequence of amino acids in the polypeptide chain. c) The arrangement of multiple polypeptide subunits. d) The local folding patterns like alpha-helices and beta-sheets.	K1	CO3
	6	Predict from which source Texturised Vegetable Protein (TVP) is primarily produced: a) Milk casein b) Egg albumin c) Soy protein d) Wheat gluten	K2	CO3
4	7	During deep-fat frying, the repeated heating of oil leads to all of the following EXCEPT: a) An increase in free fatty acid content. b) A decrease in the oil's viscosity. c) Darkening of the oil color. d) Formation of polar compounds and polymers.	K1	CO4
	8	Express the primary initial products of auto-oxidation in lipids are: a) Free fatty acids b) Hydroperoxides c) Ketones and Aldehydes d) Polymers	K2	CO4
5	9	Which of the following pigments is responsible for the red and blue colors in many fruits and is highly sensitive to pH changes? a) Chlorophyll b) Carotenoids c) Anthocyanins d) Myoglobin	K1	CO5

Cont...

5	10	The term "Nutraceutical" describes: a) A pharmaceutical drug derived from natural sources. b) A food additive used to enhance the flavour of a product. c) A food or part of a food that provides medical or health benefits, including the prevention and treatment of disease. d) A synthetic compound designed to mimic the function of a vitamin.	K2	CO5

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.	Explain the concept of water activity (a_w). How does it differ from simple water content, and why is it a more reliable indicator for predicting the shelf-life of food commodities?	K2	CO1
		(OR)		
	11.b.	Discuss the role of water in enzymatic reactions and gelation processes in food systems.		
2	12.a.	Distinguish between Caramelization and Maillard Browning in food products.	K4	CO2
		(OR)		
	12.b.	What is Resistant Starch? Classify its types and explain its physiological significance.		
3	13.a.	Determine the process of protein denaturation. Discuss three different agents (physical or chemical) that can cause denaturation and their mechanism of action.	K3	CO3
		(OR)		
	13.b.	Ascertain the key functional properties of egg albumin and wheat gluten, linking these properties to their specific food applications.		
4	14.a.	Explain the three main stages of auto-oxidation (lipid oxidation) in unsaturated fats.	K5	CO4
		(OR)		
	14.b.	Compare and contrast the composition and physical properties of butter and margarine.		
5	15.a.	Explain the classification of natural food colourants based on their chemical structure, providing one example and a characteristic food source for each class.	K5	CO5
		(OR)		
	15.b.	Explain the effect of heat and pH on Chlorophyll and Anthocyanins during food processing.		

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	Elaborate on the concept of Intermediate Moisture Foods (IMFs). Discuss the hurdles employed in their preservation and provide two examples.	K2	CO1
2	17	Describe the structure, properties, and key industrial applications of modified starch.	K3	CO2
3	18	Analyse the production, key challenges, and potential of Single Cell Protein (SCP) in addressing future global food security and sustainability.	K4	CO3
4	19	Determine the various chemical reactions that occur during deep-fat frying and their impact on flavor.	K5	CO4
5	20	Summarise the importance, scope, and applications of Nutraceuticals in the modern food industry.	K5	CO5

Z-Z-Z END