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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

May / June 2025 Semester End Main Examinations

Programme: B.E. **Semester: VIII**

Branch: Institutional Elective **Duration: 3 hrs.**

Course Code: 22BT8OEHAN **Max Marks: 100**

Course: Health And Nutrition

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

			UNIT - I	CO	PO	Marks
	1	a)	Explain malnutrition. Discuss the current situation of global malnutrition. What measures could be taken to reduce or eradicate malnutrition?	*2*	*1*	**10**
		b)	Anita is a 17-year-old student who recently began experiencing fatigue, frequent bloating, and discomfort after meals. She consumes a diet rich in carbohydrates (mainly refined grains), low in fiber, and skips breakfast regularly. Her meals are often high in fats and sugar but low in protein and essential micronutrients. Upon visiting a nutritionist, she was told that poor digestion and nutrient absorption might be affecting her energy levels and overall health. i) Describe the process of digestion and absorption of carbohydrates, proteins, and fats in the human digestive system. ii) Based on Anita's diet and symptoms, identify possible reasons for impaired digestion and nutrient absorption. iii) Explain how the absorbed nutrients (glucose, amino acids, fatty acids) are utilized by the body to meet energy and growth needs. iv) Suggest dietary modifications Anita can make to improve her digestion, absorption efficiency, and nutrient utilization.	*3*	*2,6*	**10**
			OR			
	2	a)	Rahul is a 30-year-old software engineer who leads a sedentary lifestyle. He is 175 cm tall and weighs 85 kg. During a routine health check-up, his doctor advised him to monitor his BMI and BMR to maintain a healthy lifestyle and prevent lifestyle-related disorders such as diabetes and hypertension. Using the data provided:	*3*	*2,6*	**10**

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			i) Calculate Rahul's Body Mass Index (BMI). Interpret the result based on the WHO classification. ii) What lifestyle changes can Rahul make to reduce his BMI and improve his metabolic health?			
		b)	Illustrate and explain the relationship between carbohydrate, protein and fat metabolism.	*2*	*1*	**10**
			UNIT - II			
	3	a)	Riya, a 14-year-old school-going girl, is experiencing rapid growth and has recently started menstruating. She follows a vegetarian diet but often skips meals due to academic stress. Her mother notices she frequently complains of tiredness and appears pale. A health check-up indicates iron-deficiency anemia and low protein intake. i) Discuss the nutritional needs of adolescent girls during puberty with special emphasis on iron and protein. ii) Design a one-day vegetarian meal plan for Riya that meets her energy and micronutrient requirements. iii) How do physiological changes during adolescence influence nutrient requirements? iv) Suggest strategies to encourage healthy eating habits in adolescents under academic pressure.	*3*	*2,6*	**10**
		b)	Describe any one method each used for quantitative estimation of proteins, carbohydrates, and fats in food samples.	*2*	*1*	**10**
			OR			
	4	a)	Mr. Sharma is a 70-year-old retired teacher living with his wife. He has recently been diagnosed with early-stage osteoporosis and mild hypertension. He complains of reduced appetite, difficulty chewing, and occasional constipation. His current meals mostly consist of tea, toast, and rice with very little variety. His family is concerned about his nutritional status and seeks guidance on planning balanced meals suited for his age and health conditions. i) What are the key nutritional requirements of elderly individuals, particularly with reference to bone and cardiovascular health? ii) What meal preparation and lifestyle tips can help elderly individuals maintain good nutrition despite reduced appetite and chewing difficulties?	*3*	*2,6*	**10**
		b)	"Adulteration of milk with water, starch, or detergents is a common food safety concern." Discuss simple laboratory tests and advanced analytical techniques used to detect such adulterants in milk.	*2*	*1*	**10**

			UNIT - III			
	5	a)	Mrs. Anita, a 55-year-old homemaker, was recently diagnosed with type 2 diabetes. She has a family history of diabetes and follows a diet rich in refined carbs and fried foods. She is overwhelmed and unsure how to modify her diet to manage her condition. i) Describe the role of nutrition in managing blood sugar levels in individuals with diabetes. ii) How can dietary fiber, meal timing, and portion control help in managing type 2 diabetes?	*2*	*1*	**10**
		b)	Compare and contrast the role of nutrition in managing addictive behaviors in anorexia nervosa, bulimia, and alcoholism.	*2*	*1*	**10**
			OR			
	6	a)	Explain the fundamental principles of diet therapy and their application in planning therapeutic diets.	*2*	*1*	**10**
		b)	Neha, a 19-year-old student preparing for competitive exams, complains of anxiety, fatigue, and difficulty concentrating. She often skips meals or eats high-sugar snacks and caffeinated beverages during study sessions. i) Explain the relationship between nutrition and mental health, particularly in managing stress and anxiety. ii) Suggest dietary changes that can support cognitive function and emotional well-being. iii) What specific nutrients are essential for brain health, and how can a balanced diet help reduce academic stress?	*3*	*2,6*	**10**
			UNIT - IV			
	7	a)	Mr. Patel, a 35-year-old fitness enthusiast, wants to reduce his refined sugar intake but is concerned about maintaining energy levels during his workouts. He is considering switching to nutritive sweeteners that provide calories but may have a different metabolic impact. He seeks advice on which sweeteners would be suitable for his active lifestyle and how they affect overall nutrition. i) Discuss common examples of nutritive sweeteners and their sources. ii) Provide recommendations for Mr. Patel on selecting and incorporating appropriate nutritive sweeteners to balance energy needs and health goals.	*3*	*2,6*	**10**
		b)	"Natural colours are preferable to synthetic colours." Explain the claim by giving reasons. Talk about the origins, colour pigments, health advantages, and uses of any two natural colouring agents.	*2*	*1*	**10**
			OR			

	8	a)	A food manufacturing company is developing a new line of flavored yogurts targeted at teenagers. The product development team is debating whether to use natural fruit extracts, nature-identical flavoring substances, or synthetic flavors. They also need to ensure the final product is both cost-effective and acceptable to health-conscious consumers. During a consumer trial, some participants raised concerns about the long-term health effects of artificial flavorings and their potential impact on taste perception and food preferences. i) Classify the types of food flavors the company is considering and explain the characteristics of each. ii) Discuss the factors the company should consider when choosing the type of flavoring, keeping in mind health, cost, and sensory appeal.	*3*	*2,6*	**10**
		b)	Non-nutritive sweeteners (NNS) are one of the product categories that have grown in popularity along with weight loss regimens because of their claims to guarantee rapid weight loss." Describe the use of saccharin and aspartame as non-nutritive sweeteners to support the claim. What are the restrictions for using these artificial sweeteners continuously?	*2*	*1*	**10**
			UNIT - V			
	9	a)	"Food choices for a balanced diet are influenced by many factors". Substantiate the statement by giving explanations.	*2*	*1*	**10**
		b)	Describe the differences between Indian traditional and modern eating patterns using appropriate examples.	*2*	*1*	**10**
			OR			
	10	a)	Expand and explain the following: (i) UL (ii) EAR Explain the terms R1, R2, R3, R4 and R5 pertaining to essential nutrients.	*2*	*1*	**10**
		b)	What is RNI? List the functions of RNI. Distinguish between DGGs with RNIs.	*1*		**10**

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