



SIR ARTHUR LEWIS COMMUNITY COLLEGE
ACADEMIC YEAR (2024/2025) – SEMESTER ONE
END OF SEMESTER FINAL EXAMINATION

COURSE CODE : SCI104
COURSE TITLE : Food Science & Nutrition
LECTURER(S) : Leralyn Hunte-Marty
DATE :
TIME :
DURATION : 2 Hours
ROOM :
STUDENT ID # : _____

READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

- 1. Write your student’s ID number on the question paper.
- 2. This is a Two-hour examination consisting of TWO Sections and a Periodic Table
- 3. SECTION I consists of 60 multiple-choice questions. CIRCLE the correct answer on your question paper.
- 4. SECTION II consists of 4 compulsory structured questions. Answer the question on the question paper.
- 5. Write in dark blue or black pen and answer ALL questions for each section in the SPACES provided
- 6. Draw structural and displayed formulae using a blue or black pen
- 7. Do not use correction fluid.

Section	Number	Marks Earned	Maximum Marks
Section A Multiple Choice	1-60		60 marks
Section B Structured Questions	1		15 marks
	2		15 marks
	3		15 marks
	4		15 marks
	Total		80 marks

DO NOT TURN THE PAGE UNTIL YOU ARE TOLD TO DO SO

SECTION 1 – MULTIPLE CHOICE QUESTIONS

- 1) Which bacterium is responsible for causing botulism, a severe form of food poisoning that can lead to paralysis and respiratory failure?
 - A) Clostridium perfringens
 - B) Escherichia coli
 - C) Clostridium botulinum
 - D) Salmonella
- 2) What foodborne pathogen is often associated with raw or undercooked ground beef and can cause severe cases of diarrhea and kidney failure, particularly in young children and the elderly?
 - A) Campylobacter jejuni
 - B) Listeria monocytogenes
 - C) Escherichia coli
 - D) Salmonella
- 3) What foodborne pathogen is often associated with raw or undercooked shellfish, particularly oysters, and can cause a viral infection characterized by symptoms such as jaundice and fever?
 - A) Salmonella
 - B) Hepatitis A
 - C) Listeria monocytogenes
 - D) Clostridium botulinum
- 4) What foodborne pathogen is commonly associated with raw or undercooked poultry, unpasteurized milk, and contaminated water, and can cause gastroenteritis characterized by diarrhea, abdominal cramps, and fever?
 - A) Campylobacter jejuni
 - B) Listeria monocytogenes
 - C) Salmonella
 - D) Clostridium perfringens
- 5) What does "DV" stand for on a food label?
 - A) Dietary Variation
 - B) Daily Value
 - C) Delicious Variety
 - D) Dietary Volume
- 6) Which nutrient must be listed on a food label by law?
 - A) Vitamin C
 - B) Fiber
 - C) Calcium
 - D) Trans fat
- 7) What does the term "organic" on a food label indicate?
 - A) No preservatives added
 - B) Produced without synthetic pesticides or fertilizers
 - C) Genetically modified
 - D) High nutritional value
- 8) Which of the following is NOT required on a food label?
 - A) Ingredients list
 - B) Serving size
 - C) Nutrient content claims
 - D) Expiration date

- 9) Which of the following statements is an example of a qualified health claim on a food label?
- A) "This product cures cancer."
 - B) "High in fiber, which may reduce the risk of heart disease."
 - C) "Contains antioxidants, which prevent aging."
 - D) "This product will make you lose 10 pounds in a week."
- 10) What is the primary goal of ensuring adequate nutrient and calorie intake according to dietary guidelines?
- A) To promote excessive calorie consumption for energy
 - B) To support optimal health and well-being by meeting nutritional needs
 - C) To encourage skipping meals to reduce overall calorie intake
 - D) To restrict nutrient intake for weight loss
- 11) Which dietary practice is recommended for effective weight management according to dietary guidelines?
- A) Consuming large portions of high-calorie foods
 - B) Monitoring portion sizes and calorie intake
 - C) Skipping meals to reduce overall calorie intake
 - D) Eating only one type of food for all meals
- 12) How does regular physical activity contribute to overall health according to dietary guidelines?
- A) It increases the risk of chronic diseases
 - B) It promotes weight gain
 - C) It enhances cardiovascular health, strengthens bones and muscles, and improves mental wellbeing
 - D) It has no significant impact on health
- 13) According to dietary guidelines, which food groups should be encouraged for a healthy diet?
- A) Processed foods high in sugar and fat
 - B) Foods rich in whole grains, fruits, vegetables, lean proteins, and low-fat dairy products
 - C) Foods high in saturated fats and cholesterol
 - D) Foods high in sodium and additives
- 14) What type of fats should be limited according to dietary guidelines?
- A) Trans fats and saturated fats
 - B) Monounsaturated fats and polyunsaturated fats
 - C) Omega-3 fatty acids
 - D) All fats are equally beneficial and should not be limited
- 15) Which organ is responsible for the mechanical and chemical breakdown of food through chewing and saliva secretion?
- A) Esophagus
 - B) Stomach
 - C) Small Intestines
 - D) Mouth
- 16) Peristalsis is a process primarily associated with which part of the digestive system?
- A) Stomach
 - B) Small Intestines
 - C) Large Intestines
 - D) Esophagus

- 17) Where does the majority of nutrient absorption occur in the digestive system?
- A) Stomach
 - B) Small Intestines
 - C) Large Intestines
 - D) Mouth
- 18) Which part of the small intestine receives bile from the liver and digestive enzymes from the pancreas?
- A) Duodenum
 - B) Jejunum
 - C) Ileum
 - D) Cecum
- 19) What is the primary function of the large intestine?
- A) Nutrient absorption
 - B) Water reabsorption and feces formation
 - C) Mechanical digestion
 - D) Nutrient storage
- 20) Which organ secretes hydrochloric acid and enzymes like pepsin to break down proteins?
- A) Small Intestines
 - B) Mouth
 - C) Stomach
 - D) Esophagus
- 21) Villi and microvilli are specialized structures found in which part of the digestive system?
- A) Mouth
 - B) Stomach
 - C) Small Intestines
 - D) Large Intestines
- 22) Which part of the digestive system primarily serves as a passageway for food from the mouth to the stomach?
- A) Small Intestines
 - B) Large Intestines
 - C) Esophagus
 - D) Mouth
- 23) Where does the process of chyme formation occur?
- A) Small Intestines
 - B) Large Intestines
 - C) Mouth
 - D) Stomach
- 24) Which part of the digestive system absorbs water and electrolytes from undigested food, forming feces?
- A) Small Intestines
 - B) Large Intestines
 - C) Mouth
 - D) Stomach
- 25) What unit is commonly used to measure energy in the context of nutrition and metabolism?
- A) Joules
 - B) Watts
 - C) Calories
 - D) Hertz

- 26) Which of the following best defines Basal Metabolic Rate (BMR)?
- A) The total amount of energy expended by an individual at rest in a neutral environment, in a fasting state, and awake.
 - B) The energy required for physical activity.
 - C) The energy expended during digestion, absorption, and assimilation of nutrients.
 - D) The energy required for maintaining body temperature in a cold environment.
- 27) If an individual's energy intake exceeds their energy expenditure, what is the likely outcome?
- A) Weight loss
 - B) Stable weight
 - C) Weight gain
 - D) No change in weight
- 28) What is the thermic effect of food?
- A) The amount of energy required to maintain basal bodily functions.
 - B) The energy expenditure associated with physical activity.
 - C) The increase in metabolic rate following food consumption due to digestion, absorption, and assimilation.
 - D) The energy expended to maintain body temperature in a cold environment.
- 29) Which factors are typically considered when calculating Basal Metabolic Rate (BMR) using equations like the Harris-Benedict equation or the Mifflin-St Jeor equation?
- A) Age, sex, weight, and height
 - B) Age, sex, physical activity level, and occupation
 - C) Weight, height, body fat percentage, and muscle mass
 - D) Weight, height, physical activity level, and resting heart rate
- 30) Which of the following is a characteristic of good nutrition?
- A) Excessive intake of processed foods
 - B) Inadequate consumption of fruits and vegetables
 - C) Balanced intake of macronutrients and micronutrients
 - D) Irregular meal patterns
- 31) What is undernutrition?
- A) Excessive intake of nutrients leading to obesity
 - B) Inadequate intake of nutrients relative to the body's needs
 - C) Optimal intake of nutrients for health and wellbeing
 - D) Regular consumption of nutrient-rich foods
- 32) Which of the following is a deficiency disease caused by insufficient intake of vitamin C?
- A) Rickets
 - B) Scurvy
 - C) Beriberi
 - D) Pellagra
- 33) What is over-nutrition?
- A) Excessive intake of nutrients relative to the body's needs
 - B) Inadequate intake of nutrients leading to malnutrition
 - C) Balanced intake of nutrients for optimal health
 - D) Regular consumption of nutrient-dense foods
- 34) Which health condition is commonly associated with over-nutrition?
- A) Scurvy
 - B) Iron-deficiency anemia
 - C) Obesity
 - D) Rickets

- 35) Which macronutrient is the body's primary source of energy?
- A) Protein
 - B) Carbohydrates
 - C) Fat
 - D) Vitamins
- 36) What is the recommended daily intake of fruits and vegetables according to dietary guidelines?
- A) 1 serving
 - B) 3 servings
 - C) 5 servings
 - D) 10 servings
- 37) Which of the following is considered a wholesome food?
- A) Packaged snacks high in added sugars and fats
 - B) Fresh fruits and vegetables
 - C) Sugary cereals with artificial flavors
 - D) Processed meats with added preservatives
- 38) Which nutrient is often fortified in food products like cereal to prevent deficiencies?
- A) Vitamin C
 - B) Calcium
 - C) Iron
 - D) Vitamin B12
- 39) Consuming a balanced diet rich in whole foods can help reduce the risk of which of the following health conditions?
- A) Obesity and type 2 diabetes
 - B) Osteoporosis
 - C) Vitamin deficiencies
 - D) Food allergies
- 40) Which of the following is a primary reason for the importance of food preservation?
- A) To increase food waste
 - B) To decrease shelf life
 - C) To reduce foodborne illness
 - D) To promote microbial growth
- 41) Which principle of food preservation involves the removal of moisture from food?
- A) Canning
 - B) Dehydration
 - C) Fermentation
 - D) Pasteurization
- 42) What is the primary function of alcohol in food preservation?
- A) Adding flavor to food
 - B) Preventing microbial growth
 - C) Enhancing food texture
 - D) Increasing food moisture
- 43) During the processing of dairy products, what chemical change contributes to the transformation of milk into cheese?
- A) Fermentation
 - B) Oxidation
 - C) Coagulation
 - D) Hydrolysis

- 44) Which physical change contributes to the texture improvement of bread during baking?
- A) Enzymatic browning
 - B) Maillard reaction
 - C) Gelatinization of starch
 - D) Caramelization of sugars
- 45) What chemical change occurs during the caramelization of sugars in the cooking process?
- A) Oxidation
 - B) Hydrolysis
 - C) Maillard reaction
 - D) Dehydration
- 46) What distinguishes traditional food processing methods from new methods in biotechnology?
- A) Traditional methods involve manual labor, while new methods are automated.
 - B) Traditional methods rely on natural processes, while new methods use advanced technology.
 - C) Traditional methods are faster, while new methods take longer.
 - D) Traditional methods are less efficient, while new methods are more efficient.
- 47) Microorganisms are:
- A) Living organisms too small to be seen without a microscope
 - B) Macroscopic organisms visible to the naked eye
 - C) Organisms found only in extreme environments
 - D) Organisms that exclusively inhabit aquatic environments
- 48) HACCP principles concerning food safety focus on:
- A) Inspecting finished food products
 - B) Identifying and controlling hazards throughout the food production process
 - C) Marketing strategies for food products
 - D) Training employees in customer service
- 49) Which of the following is a characteristic of saturated fatty acids?
- A) They have double bonds between carbon atoms.
 - B) They are typically liquid at room temperature.
 - C) They are found in plant oils.
 - D) They have all carbon atoms bonded to hydrogen atoms.
- 50) What term describes a fatty acid chain with one or more double bonds between carbon atoms?
- A) Saturated fatty acid
 - B) Unsaturated fatty acid
 - C) Trans fatty acid
 - D) Monounsaturated fatty acid
- 51) Which of the following is a primary function of water in the human body?
- A) Providing energy
 - B) Regulating body temperature
 - C) Building muscle tissue
 - D) Transporting oxygen in the blood
- 52) Which carbohydrate undergoes the Maillard reaction, leading to the browning of foods during cooking?
- A) Starch
 - B) Sucrose
 - C) Cellulose
 - D) Glucose

- 53) Gums are carbohydrates commonly used as thickening agents in food. Which type of carbohydrate are gums?
- A) Monosaccharides
 - B) Disaccharides
 - C) Polysaccharides
 - D) Oligosaccharides
- 54) Which religious dietary restriction prohibits the consumption of pork?
- A) Hinduism
 - B) Judaism
 - C) Islam
 - D) Christianity
- 55) Which of the following is a common food allergen?
- A) Broccoli
 - B) Chicken
 - C) Wheat
 - D) Carrots
- 56) What type of product might a lactose-intolerant individual choose as an alternative to cow's milk?
- A) Almond milk
 - B) Buttermilk
 - C) Skim milk
 - D) Goat milk
- 57) Which dietary component should individuals with hypertension (high blood pressure) reduce to help manage their condition?
- A) Sodium
 - B) Potassium
 - C) Fiber
 - D) Calcium
- 58) Which of the following foods do vegetarians typically avoid?
- A) Fruits and vegetables
 - B) Dairy products and eggs
 - C) Whole grains and legumes
 - D) Fish and seafood
- 59) What do vegans exclude from their diet?
- A) Meat, poultry, and fish
 - B) Dairy products, eggs, and honey
 - C) Fruits and vegetables
 - D) Grains and legumes
- 60) Which type of fat should individuals with high cholesterol levels limit in their diet?
- A) Monounsaturated fats
 - B) Polyunsaturated fats
 - C) Saturated fats
 - D) Trans fats

SECTION II – STRUCTURED QUESTIONS

This section consists of **FOUR** compulsory questions. Answer all questions on this paper.

QUESTION ONE

- a) What dietary foods must diabetics monitor closely to manage blood sugar levels? **[1 Mark]**
- b) What is the glycemic index (GI), and why is it relevant to diabetics? **[2 Marks]**
- c) How can fibre-rich foods benefit individuals with diabetes mellitus? **[2 Marks]**
- d) What role does portion control play in the diet of individuals with diabetes mellitus? **[2 Marks]**
- e) How can reading food labels help individuals with diabetes mellitus make informed dietary choices? **[3 Marks]**
- f) What are macronutrients and micronutrients? Give examples of each. **[4 Marks]**
- g) A patient has brittle bones and frequent muscle cramps. Which micronutrient deficiency might be the cause? **[1 Mark]**

TOTAL 15 MARKS

QUESTION TWO

- a) What dietary factor is strongly associated with the development and management of hypertension? **[1 Mark]**

- b) How does reducing sodium intake contribute to the management of hypertension? **[2 Marks]**

- c) How can alcohol consumption affect blood pressure, and what are the recommended limits for individuals with hypertension? **[2 Marks]**

- d) What is lactose intolerance? **[1 Mark]**

- e) State four (4) common symptoms of lactose intolerance. **[2 Marks]**

- f) Identify two strategies to minimize symptoms of lactose intolerance when consuming dairy products. **[2 Marks]**

- g) A patient is missing their gallbladder. How might this affect digestion? **[2 Marks]**

h) Why is the small intestine considered the most important site of digestion and absorption? **[2 Marks]**

i) How would you adjust a meal for someone struggling to digest lactose? **[1 Mark]**

TOTAL 15 MARKS

QUESTION THREE

- a) What is food biotechnology? **[1 Mark]**
- b) Define food preservation and explain its primary objective. **[2 Marks]**
- c) How does packaging interact with preservation methods to maintain food quality? **[2 Marks]**
- d) Suggest preservation methods to be used for value-added products made from breadfruit. **[3 Marks]**
- e) Identify two examples of thermal processing techniques. **[2 Marks]**
- f) Explain the structural difference between saturated and unsaturated fats **[4 Marks]**
- g) Identify one role micronutrients play in the body. **[1 Mark]**

TOTAL 15 MARKS

QUESTION FOUR

a) What would happen to digestion if enzymes like amylase or lipase were absent?
[2 Marks]

b) What are the food groups represented on MyPlate?
[5 Marks]

c) Explain why MyPlate recommends making half your plate fruits and vegetables.
[5 Marks]

d) If a college student skips breakfast regularly, how can MyPlate help guide healthier habits? Give examples
[3 Marks]

TOTAL 15 MARKS

END OF EXAM