



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 : Tuesday 29th April, 2025
TIME : 1:00 pm – 3:00 p.m
DURATION : 2 Hours
ROOM : OTW-1R-08
STUDENT ID # : _____

GENERAL INFORMATION AND INSTRUCTIONS

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 THIS PAGE UNTIL YOU ARE TOLD TO DO SO

SECTION I

1. The enzyme in the mouth that begins the digestion of starch is
 - A. salivary ptyalin
 - B. salivary amylase
 - C. sucrase
 - D. lipase
2. Glucose, fructose, and galactose are
 - A. polysaccharides
 - B. disaccharides
 - C. enzymes
 - D. monosaccharides
3. The three main groups of carbohydrates are
 - A. fats, proteins, and minerals
 - B. glucose, fructose, and galactose
 - C. monosaccharides, disaccharides, and polysaccharides
 - D. sucrose, cellulose, and glycogen
4. Glycogen is stored in the
 - A. heart and lung
 - B. liver and muscles
 - C. pancreas and gallbladder
 - D. small and large intestines
5. Insoluble dietary fibre
 - A. can increase blood glucose
 - B. can decrease blood cholesterol
 - C. commonly causes diverticular disease
 - D. is preferably provided by commercially prepared fibre products
6. Starch is
 - A. the form in which glucose is stored in plants
 - B. a monosaccharide
 - C. an insoluble form of dietary fibre
 - D. found only in grains
7. What is the main structural difference between saturated and unsaturated fats?
 - A. Saturated fats contain double bonds, while unsaturated fats do not.
 - B. Saturated fats have only single bonds between carbon atoms, while unsaturated fats contain one or more double bonds.
 - C. Unsaturated fats have more hydrogen atoms than saturated fats.
 - D. Unsaturated fats are primarily found in animal products.
8. Why are Trans fats considered harmful to health?
 - A. They lower both LDL and HDL cholesterol.
 - B. They increase LDL (bad cholesterol) while decreasing HDL (good cholesterol).
 - C. They provide essential fatty acids.
 - D. They are needed for brain development.
9. The primary function of protein is to
 - A. build and repair body cells
 - B. provide energy
 - C. digest minerals and vitamins
 - D. none of the above

10. Proteins are broken down in the body to
- A. peptides
 - B. ascorbic acids
 - C. amino acids
 - D. calories
11. If a nutrition label lists "partially hydrogenated oil" as an ingredient, what does this indicate?
- A. The food is a good source of omega-3 fatty acids.
 - B. The product contains Trans fats, which may increase the risk of heart disease.
 - C. The food is rich in healthy monounsaturated fats.
 - D. The product is cholesterol-free.
12. A patient with both Type 2 Diabetes and Hypertension needs to improve their diet. Which dietary change would be MOST beneficial?
- A. Increasing saturated fat intake
 - B. Eating more whole grains, fruits, and vegetables
 - C. Consuming more processed foods for quick energy
 - D. Drinking sugary beverages to maintain energy levels
13. Which of the following best explains the relationship between obesity and Type 2 Diabetes?
- A. Obesity increases insulin sensitivity, reducing the risk of diabetes
 - B. Obesity leads to insulin resistance, increasing the risk of diabetes
 - C. People with obesity produce more insulin, which prevents diabetes
 - D. There is no connection between obesity and diabetes
14. Why is hypertension called the "silent killer"?
- A. It causes immediate pain and discomfort.
 - B. It does not show noticeable symptoms until complications arise
 - C. It can be cured easily with medication
 - D. It affects only elderly people
15. Sodium is commonly found in
- A. sugar
 - B. fresh fruits
 - C. baking soda and baking powder
 - D. coffee and tea
16. Herbs, spices, and flavourings may
- A. be used in sodium restricted diets
 - B. never be used in sodium restricted diets
 - C. increase sodium in the diet
 - D. be used only in the mild sodium-restricted diet
17. Cholesterol
- A. is found in food and in body tissue
 - B. has no connection to lipoproteins
 - C. is the primary cause of congestive heart failure
 - D. is commonly found in fruits and vegetables
18. Examples of foods particularly rich in potassium are
- A. milk and ice cream
 - B. beef and lamb
 - C. whole grain breads and cereals
 - D. bananas and oranges

19. The result of those processes is that the body takes in and uses food for growth, development, and maintenance of health is
- A. respiration
 - B. diet therapy
 - C. nutrition
 - D. digestion
20. To nourish the body adequately and to maintain health, one must
- A. avoid all low-nutrient density foods
 - B. eat foods containing the six classes of nutrients
 - C. Include fats at every meal
 - D. restrict proteins at breakfast
21. Nutrients used primarily to provide energy to the body are
- A. vitamins, water, and minerals
 - B. carbohydrates, proteins, and fats
 - C. proteins, vitamins, and fats
 - D. vitamins, minerals, and carbohydrates
22. Nutrients used mainly to build and repair body tissues are
- A. proteins, vitamins, and minerals
 - B. carbohydrates, fats, and minerals
 - C. fats, water, and minerals
 - D. fats, vitamins, and minerals
23. Foods such as potato chips, cakes, sodas, and candy are
- A. high-nutrient-density foods
 - B. essential nutrient foods
 - C. low-nutrient-density foods
 - D. nutritious foods
24. Over nutrition or undernutrition of the six classes of nutrients in the diet may result in
- A. increased energy
 - B. malnutrition
 - C. indigestion
 - D. diabetes
25. Which of the following food choices would be best for someone trying to eliminate trans fats from their diet?
- A. Fried fast food and margarine
 - B. Processed snack foods and vegetable shortening
 - C. Olive oil and avocados
 - D. Packaged pastries and deep-fried foods
26. 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
27. Fruits and vegetables are rich sources of
- A. vitamins
 - B. fats
 - C. proteins and fibre
 - D. only B vitamins
28. Excessive amounts of salt in the diet
- A. raise cholesterol levels substantially
 - B. are thought to contribute to hypertension
 - C. cause cirrhosis of the liver
 - D. have no relevance to one's nutritional status

29. MyPlate
- A. food groups nutritionally interchangeable
 - B. is an outline for meal planning for adults only
 - C. advises that fruits and vegetables to be eaten in moderation
 - D. recommended portion ranges for the five food groups
30. Which factor makes pickling an effective preservation method?
- A. High acidity prevents bacterial growth
 - B. Sugar content increases spoilage
 - C. It allows bacteria to grow quickly
 - D. It reduces the nutritional value of food
31. What is the typical range of water activity (a_w) in fresh foods?
- A. 0.2
 - B. 0.4
 - C. 0.6 – 0.7
 - D. 0.98 – 1.00
32. How does water activity (a_w) influence microbial growth in food?
- A. Higher water activity increases microbial growth.
 - B. Lower water activity promotes microbial growth
 - C. Water activity does not affect microbial growth
 - D. Water activity only affects the taste of food
33. Good sources of water include
- A. oranges and melon
 - B. seafood and meats
 - C. baked desserts and rice
 - D. all of the above
34. A person is lactose intolerant. What enzyme is missing or deficient in their digestive system?
- A. Amylase
 - B. Lipase
 - C. Lactase
 - D. Pepsin
35. Which factor is LEAST likely to affect enzyme activity?
- A. Temperature
 - B. pH
 - C. Substrate concentration
 - D. The color of the solution
36. 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*
37. To which biomolecule group do enzymes belong?
- A. Carbohydrates
 - B. Proteins
 - C. Lipids
 - D. Nucleic acids

38. Minerals are inorganic elements that
- A. help to build and repair tissues
 - B. are found only in bones
 - C. provide energy when carbohydrates are lacking
 - D. can substitute for proteins
39. The trace minerals in the human body are defined as
- A. those minerals that cannot be detected in laboratory tests
 - B. those essential minerals are found in very small amounts
 - C. those minerals that are not essential to health
 - D. only those minerals that are found in the blood
40. Sodium is often restricted in cardiovascular conditions because it
- A. causes the heart to beat slowly
 - B. encourages the growth of the heart
 - C. contributes to edema
 - D. raises the blood sugar
41. The main causes of iron deficiency are
- A. malabsorption
 - B. lack of stomach acid
 - C. insufficient intake
 - D. all of the above
42. Iron is known to be a necessary component of
- A. adipose tissue
 - B. hemoglobin
 - C. thyroxine
 - D. amino acids
43. The vitamin known to prevent scurvy is
- A. vitamin A
 - B. vitamin B complex
 - C. vitamin C
 - D. vitamin D
44. The vitamin that is necessary for the proper clotting of the blood is
- A. vitamin A
 - B. vitamin K
 - C. vitamin D
 - D. niacin
45. Night blindness is caused by a deficiency of
- A. vitamin A
 - B. thiamine
 - C. niacin
 - D. vitamin C
46. Water-soluble vitamins include
- A. A, D, E, and K
 - B. A, B6, and C
 - C. Thiamine, niacin, and retinol
 - D. Thiamine, riboflavin, niacin, B₆, and B₁₂
47. Fat-soluble vitamins
- A. cannot be stored in the body
 - B. are lost easily during cooking
 - C. are dissolved by water
 - D. are slower than water-soluble vitamins to exhibit deficiencies

48. a micro-organism is
- A. a unit of measurement
 - B. sometimes pathogenic
 - C. a component of a microscope
 - D. an individual human cell
49. Someone who is capable of spreading an infectious organism but is not sick is called
- A. food handler
 - B. carrier
 - C. transport
 - D. fomite
50. Which food would have the lowest water activity (aw)?
- A. Fresh vegetables
 - B. Dried pasta
 - C. Raw meat
 - D. Fresh milk
51. The reason for food spoilage is
- A. growth of micro-organisms like bacteria, fungus etc. insects
 - B. autolysis
 - C. oxidation by air that causes rancidity of colour change
 - D. all of the above
52. A gluten allergy that results in severe inflammation of the gastrointestinal tract, pain and diarrhea, and malnutrition due to the inability to absorb nutrients requires which type of diet:
- A. low cholesterol
 - B. celiac
 - C. low calorie
 - D. diabetic
53. When protein is heated, it:
- A. it melts
 - B. forms dextrins
 - C. coagulates
 - D. swells
54. The nutritive value of this nutrient is not lost during cooking:
- A. fats
 - B. vitamins
 - C. protein
 - D. minerals
55. All the following techniques are household preservation techniques except
- A. smoking
 - B. lyophilisation
 - C. dehydration
 - D. salting
56. Pasteurization is the process of heating milk
- A. above 121°C
 - B. above the boiling point
 - C. below boiling point
 - D. above 150°C
57. Which of the following bacteria are responsible for causing the greatest number of food-borne illnesses?
- A. E.coli
 - B. Salmonella
 - C. Botulism
 - D. Listeria

58. Which of the following is NOT a critical factor in the growth of dangerous foodborne bacteria?
- A. temperature
 - B. pH level (acidity)
 - C. moisture
 - D. altitude
59. Which of the following groups of people have a higher-than-normal chance of contracting a case of food poisoning?
- A. very young children
 - B. pregnant women
 - C. the elderly and people with compromised immune systems
 - D. all of the above
60. Which food is most commonly associated with cases of foodborne illnesses due to Salmonellosis?
- A. raw chicken
 - B. raw eggs
 - C. raw vegetables
 - D. none of the above

SECTION II

This consists of 4 compulsory structured questions. Answer the question on the question paper.

QUESTION ONE

- a) Define water activity and explain its significance in food stability. **[4 Marks]**
- b) Analyze the impact of cooking and processing on carbohydrates, with a specific focus on the Maillard reaction, gums, and pectin. **[6 Marks]**
- c) How would you recommend increasing omega-3 fatty acid intake in someone's diet while minimizing the intake of unhealthy fats? Give three recommendations. **[3 Marks]**
- d) What are the essential amino acids, and state two (2) reasons why they are important? **[2 Marks]**

TOTAL 15 MARKS

QUESTION TWO

- a) A restaurant reports multiple cases of foodborne illness linked to creamy desserts. Which microorganism is the most likely culprit, and what preventive measures should be taken?

[5 Marks]

- b) How can food handlers prevent foodborne illnesses caused by *Escherichia coli* and *Salmonella*?

[5 Marks]

- c) Compare food infection and food intoxication, providing an example of each.

[5 Marks]

TOTAL 15 MARKS

QUESTION THREE

a) State two (2) common biotechnological methods used in food preservation. **[2 Marks]**

b) How do food additives improve food quality and safety? **[4 Marks]**

c) A person has difficulty digesting fats. Which part of the digestive system might not function correctly, and why? **[3 Marks]**

d) How do the absorption functions of the small and large intestines differ? **[2 Marks]**

c) What are the main organs involved in digestion, and what are their roles? **[4 Marks]**

TOTAL 15 MARKS

QUESTION FOUR

What is the difference between a vegetarian and a vegan diet?

[2 Marks]

Answer:

A hypertensive patient wants to modify their diet. Identify four (4) changes they should make.

[4 Marks]

What are the two main types of cholesterol?

[1 Mark]

Why is high LDL cholesterol considered a health risk?

[3 Marks]

A patient has high cholesterol. What dietary changes should they make to lower their LDL levels?

[5 Marks]

TOTAL 15 MARKS

END OF EXAM