



**AMREF INTERNATIONAL UNIVERSITY
SCHOOL OF MEDICAL SCIENCES
DEPARTMENT OF NURSING & MIDWIFERY SCIENCES
END OF SEMESTER EXAMINATIONS
MAY 2026**

COURSE TITLE: BSN 217: HUMAN NUTRITION AND DIETETICS

DATE: 10TH AUGUST 2026

Time: 2 HOURS START: 9AM FINISH: 11 AM

INSTRUCTIONS

1. This exam is out of 70 marks
2. This Examination comprises THREE Sections. Section I: Multiple Choice Questions (20 marks) Section II: Short Answer Questions (30 marks) and Section III: Long Answer Questions (20 marks)
3. Answer ALL Questions.
4. Do Not write anything on the question paper -use the back of your booklet for rough work if need be.

Section A: Multiple Choice Questions (20 Marks)

Instructions

- Answer **ALL** questions.
- Each question carries **1 mark**.
- Select the **ONE BEST** answer.
- Write only the letter corresponding to the correct answer.

1. Which historical figure is credited with the statement, "*Let food be thy medicine and medicine be thy food*"?

- A. Galen
- B. Hippocrates
- C. Aristotle
- D. Florence Nightingale

2. A patient with metastatic pancreatic cancer has experienced a 12% unintentional weight loss over the past six months and reduced oral intake for three weeks. Which statement BEST explains why early nutrition intervention is recommended?

- A. Weight loss in cancer is inevitable, and nutrition support has little impact.
- B. Cancer-associated inflammation contributes to metabolic alterations that accelerate muscle wasting and worsen clinical outcomes.
- C. Nutrition support should begin only when BMI falls below 18.5 kg/m².
- D. Enteral nutrition should be delayed until chemotherapy has been completed.

3. A 45-year-old man is admitted with decompensated liver cirrhosis. He reports a 9% unintentional weight loss over four months, poor oral intake for one week because of early satiety from ascites and has a BMI of 22 kg/m². Which nutrition screening tool is MOST appropriate for identifying his risk of malnutrition on admission?

- A. Mini Nutritional Assessment (MNA)
- B. Malnutrition Universal Screening Tool (MUST)
- C. Patient-Generated Subjective Global Assessment (PG-SGA)
- D. Global Leadership Initiative on Malnutrition (GLIM)

4. Which glucose transporter is primarily responsible for insulin-stimulated glucose uptake into skeletal muscle and adipose tissue?

- A. GLUT1
- B. GLUT2
- C. GLUT4
- D. SGLT1

5. A dietitian is comparing two foods that provide similar amounts of protein but differ in amino acid composition and digestibility. Which statement BEST describes the purpose of the Protein Digestibility-Corrected Amino Acid Score (PDCAAS)?

- A. It estimates an individual's daily protein requirement.
- B. It evaluates protein quality based on essential amino acid composition and digestibility.
- C. It measures protein utilization solely through nitrogen retention.
- D. It is used only to compare proteins of animal origin.

6. Which amino acid becomes conditionally essential during severe physiological stress such as burns, trauma or sepsis?

- A. Leucine
- B. Glutamine
- C. Valine
- D. Methionine

7. A 24-month-old child is admitted with bilateral pitting edema, hepatomegaly, sparse depigmented hair and peeling skin lesions. The child's weight-for-height Z-score is -1.5 , while serum albumin is markedly reduced. Which diagnosis BEST explains these findings?

- A. Marasmus
- B. Marasmic kwashiorkor
- C. Kwashiorkor
- D. Moderate acute malnutrition

8. Current evidence suggests omega-3 fatty acids reduce cardiovascular risk primarily because they:

- A. Increase LDL cholesterol clearance.
- B. Compete with omega-6 fatty acids during eicosanoid synthesis, resulting in less inflammatory mediators.
- C. Eliminate all inflammatory pathways.
- D. Increase triglyceride synthesis.

9. Which of the following best explains why phospholipids are essential for normal human physiology?

- A. They are the body's principal storage form of energy.
- B. They form the structural framework of cell membranes and facilitate lipid transport.
- C. They are the primary source of essential amino acids.
- D. They are converted directly into glucose during fasting.

10. A patient receiving long-term warfarin therapy completes a three-week course of broad-spectrum antibiotics. Which laboratory parameter requires the closest monitoring?

- A. Serum calcium
- B. Serum albumin
- C. International Normalized Ratio (INR)
- D. Serum phosphate

11. A patient with chronic alcohol use disorder presents with confusion, ophthalmoplegia and ataxia. Which vitamin deficiency is the MOST likely cause?

- A. Riboflavin (Vitamin B₂)
- B. Pyridoxine (Vitamin B₆)
- C. Thiamine (Vitamin B₁)
- D. Cobalamin (Vitamin B₁₂)

12. Which combination of micronutrients is essential for optimal erythropoiesis because one enhances iron absorption while the other is required for DNA synthesis?

- A. Vitamin C and Folate
- B. Vitamin A and Vitamin D
- C. Vitamin K and Calcium
- D. Vitamin E and Selenium

13. Which sequence correctly describes the physiological response to declining serum calcium concentration?

- A. Increased calcitonin → decreased bone resorption
- B. Increased parathyroid hormone → increased renal calcium reabsorption → increased activation of vitamin D
- C. Increased insulin secretion → increased intestinal calcium absorption
- D. Increased aldosterone secretion → increased calcium retention

14. Two hospitalized patients have identical body weight and physical activity levels. One has severe sepsis while the other is clinically stable. Which component of total daily energy expenditure is MOST likely to differ between the two patients?

- A. Resting Energy Expenditure
- B. Thermic Effect of Food
- C. Physical Activity Energy Expenditure
- D. Dietary Energy Density

15. A patient presents with delayed wound healing, impaired taste, alopecia and recurrent infections. Which trace element deficiency is MOST likely responsible?

- A. Copper
- B. Selenium
- C. Zinc
- D. Chromium

16. Which statement correctly differentiates nutrition screening from nutrition assessment?

- A. Nutrition screening establishes a nutrition diagnosis.
- B. Nutrition assessment is a rapid process performed only by nurses.
- C. Nutrition screening identifies individuals at risk of malnutrition, whereas nutrition assessment comprehensively evaluates nutritional status to guide intervention.
- D. Nutrition assessment is always performed before nutrition screening.

17. Which of the following is the BEST example of a correctly written Nutrition Care Process (PES) statement?

- A. Inadequate energy intake related to poor appetite as evidenced by an 8% unintentional weight loss in one month.
- B. Diabetes mellitus related to hyperglycemia as evidenced by HbA1c of 10%.
- C. Hypertension related to obesity as evidenced by blood pressure of 170/100 mmHg.
- D. Chronic kidney disease related to elevated creatinine as evidenced by eGFR of 18 mL/min/1.73 m².

18. Which dietary pattern has demonstrated the greatest reduction in LDL cholesterol through the combined use of plant sterols, soy protein, viscous fibre and nuts?

- A. Mediterranean Diet
- B. DASH Diet
- C. Portfolio Diet
- D. Nordic Diet

19. A 56-year-old Kenyan man with hypertension, dyslipidemia and obesity asks which dietary pattern has the strongest evidence for simultaneously lowering blood pressure and reducing cardiovascular risk while remaining adaptable to locally available foods. Which is the MOST appropriate recommendation?

- A. Ketogenic Diet
- B. DASH Diet
- C. Carnivore Diet
- D. Very-low-fat diet

20. A 30-month-old child with severe acute malnutrition has completed inpatient stabilization with F-75 and F-100 and is now clinically stable, alert, has a good appetite and no medical complications. Which is the MOST appropriate next step in nutrition management?

- A. Continue F-75 until the child reaches a normal weight-for-height Z-score.
- B. Transition to community-based management using Ready-to-Use Therapeutic Food (RUTF) with regular follow-up.
- C. Begin an unrestricted family diet without therapeutic feeding.
- D. Continue inpatient F-100 feeding until serum albumin normalizes.

SECTION B: SHORT ANSWER QUESTIONS (30 Marks)

Instructions

- Answer **ALL** questions.
- Show all calculations where applicable.
- Support your answers with evidence-based nutrition principles.

21. A 58-year-old man is newly diagnosed with Type 2 Diabetes Mellitus. He has a BMI of 31 kg/m², hypertension, dyslipidemia and an HbA1c of 9.2%.

a) Using the Diabetes Plate Method, describe how his meals should be planned. (3 marks)

b) State two evidence-based lifestyle recommendations, other than dietary modification, that would improve his glycemic control. (2 marks)

22. A 67-year-old woman with **Stage 5 chronic kidney disease (CKD)** has recently commenced **hemodialysis**.

- a) Explain why protein requirements differ before and after initiation of haemodialysis. (2 marks)
- b) Describe **three** nutrition interventions that should be included in her nutrition care plan. (3 marks)

23. A 54-year-old man with **decompensated liver cirrhosis** is admitted with ascites, muscle wasting and recurrent episodes of hepatic encephalopathy.

Discuss the nutritional management of this patient under the following headings:

- a) Energy requirements. (1 mark)
- b) Protein recommendations. (2 marks)
- c) Sodium and fluid management. (2 marks)

24. Nutrition assessment is an essential component of oncology care.

- a) Differentiate between **nutrition screening** and **nutrition assessment**. (2 marks)
- b) Explain **three** reasons why the **Patient-Generated Subjective Global Assessment (PG-SGA)** is considered the preferred nutrition assessment tool for patients with cancer. (3 marks)

25. Despite major advances in treatment, HIV continues to have important nutritional implications in Kenya.

- a) Describe **three** nutrition-related complications commonly observed in adults living with HIV. (3 marks)
- b) State **two** nutrition interventions that improve nutritional status and treatment outcomes in adults receiving antiretroviral therapy (ART). (2 marks)

26. A 72-year-old man with **chronic heart failure (NYHA Class III)** has developed **cardiac cachexia**. He has experienced an **11% unintentional weight loss** over the past six months and reports severe fatigue, early satiety and poor appetite.

Anthropometric Data

- Height: **175 cm**
- Weight: **68 kg**

- BMI: 22.2 kg/m²

The patient is clinically stable but consumes less than 60% of his estimated nutritional requirements.

a) Estimate this patient's **daily energy requirement (kcal/day)**. Show your working and state the equation or guideline used. (2 marks)

b) Estimate this patient's **daily protein requirement (g/day)**. Show your working and state the guideline used. (2 marks)

c) Briefly describe **one** additional nutrition intervention, other than increasing calorie intake, that would help improve his nutritional status and explain why. (1 mark)

(Total: 5 Marks)

Total Section B: 30 Marks

SECTION C: CASE STUDIES (20 Marks)

Instructions

- Answer **BOTH** questions.
- Show all calculations and justify your answers where appropriate.
- Use evidence-based nutrition principles and the Nutrition Care Process where applicable.

27. Case Study 1: HIV, Chronic Kidney Disease, Hypertension and Type 2 Diabetes Mellitus

A 48-year-old woman from Kisumu has been living with HIV for 10 years and has been adherent to antiretroviral therapy (ART). She is admitted with worsening fatigue, bilateral ankle edema and poor appetite.

Medical History

- HIV infection
- Stage 4 chronic kidney disease (CKD)
- Hypertension
- Type 2 Diabetes Mellitus

Nutrition Assessment

Height: 165 cm

Current Weight: 58 kg

Usual Weight (6 months ago): **65 kg**

BMI: **21.3 kg/m²**

Blood Pressure: **168/96 mmHg**

Laboratory Results

Test	Result	Reference Range
eGFR	22 mL/min/1.73 m ²	>90 mL/min/1.73 m ²
Potassium	5.8 mmol/L	3.5–5.0 mmol/L
Phosphate	1.9 mmol/L	0.8–1.5 mmol/L
Albumin	31 g/L	35–50 g/L
HbA1c	8.5%	<5.7% (non-diabetic)
Haemoglobin	9.8 g/dL	Female: 12–16 g/dL

The patient reports:

- Eating one meal daily.
- Poor appetite.
- Drinking several glasses of fruit juice daily.
- Adding salt to most meals.
- Difficulty purchasing food.

Questions

- a) Identify **four nutrition problems** for this patient. (4 marks)
- b) Recommend **four nutrition interventions** that should be included in her nutrition care plan and justify each recommendation. (4 marks)
- c) Identify **two members of the multidisciplinary team**, other than the nurse, who should be involved in her care and explain their roles. (2 marks)

(Total: 10 Marks)

28. Case Study 2: Pancreatic Cancer Following a Whipple Procedure

A 66-year-old man underwent a **Whipple procedure (pancreaticoduodenectomy)** six weeks ago for pancreatic adenocarcinoma and has recently started adjuvant chemotherapy.

Nutrition Assessment

Height: **175 cm**

Current Weight: **63 kg**

Weight 3 months ago: **74 kg**

BMI: **20.6 kg/m²**

Clinical Findings

- Poor appetite
- Early satiety
- Frequent diarrhoea
- Steatorrhoea
- Fatigue
- Reduced oral intake

Laboratory Results

Test	Result	Reference Range
Blood glucose	14.5 mmol/L	3.9–7.8 mmol/L
Albumin	29 g/L	35–50 g/L
Haemoglobin	10.2 g/dL	Male: 13.5–17.5 g/dL

Performance Assessment

- ECOG Performance Status: **2**
- PG-SGA Score: **14**

Questions

a) Name four anatomical structures that are routinely removed during a standard Whipple procedure. (2 marks)

b) Explain four reasons why this patient is at high nutritional risk. (4 marks)

c) Recommend two nutrition interventions that are appropriate for this patient and justify each recommendation. (2 marks)

d) Identify two micronutrient deficiencies that this patient is at increased risk of developing following a Whipple procedure and explain why. (2 marks)

(Total: 10 Marks)