

CANDIDATE NUMBER.....



"Investing in Africa's Future"

**COLLEGE OF HEALTH, AGRICULTURE AND NATURAL
SCIENCES**

DEPARTMENT OF PUBLIC HEALTH AND NURSING

BACHELOR OF SCIENCE IN NURSING

SNS 1208: BIOCHEMISTRY AND NUTRITION

END OF SEMESTER FINAL EXAMINATIONS

APRIL 2026

LECTURER: Mr Z CHIWODZA

DURATION: THREE (3) HOURS

INSTRUCTIONS

1. Write your candidate number on the space provided on top of each page
 2. Answer **all** questions in sections A on the question paper.
 3. Answer **all** questions in section B on separate answer sheets provided.
 4. Answer any **2** questions in section C on separate answer sheets provided
 5. The mark allocation for each question is indicated at the end of the question
 6. Credit will be given for logical, systematic and neat presentations in sections B and C
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SECTION A: MULTIPLE CHOICE [40 MARKS]

- Answer all questions by encircling the correct response T for TRUE or F for FALSE for each statement in all the questions
 - Each correct response is allocated half a mark
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1. A 65-year-old patient presents with severe chest pain. Cardiac enzyme tests are ordered. Which of the following statements are correct?

- a) T F Troponin levels rise within 3-4 hours after myocardial infarction.
- b) T F Elevated CK-MB is specific only to cardiac tissue damage.
- c) T F Troponin remains elevated for 7-14 days after MI.
- d) T F AST levels are more specific for cardiac damage than troponin.

2. Which of the following statements about diabetes mellitus are correct?

- a) T F Fasting blood glucose above 7.0 mmol/L indicates diabetes.
- b) T F HbA1c measures average blood glucose over the past 2-3 months.
- c) T F Insulin promotes glucose uptake into cells.
- d) T F Type 1 diabetes is caused by insulin resistance.

3. Which of the following are functions of water in the human body?

- a) T F Acts as a solvent for biochemical reactions.
- b) T F Provides energy through hydrolysis.
- c) T F Maintains body temperature through evaporation.
- d) T F Transports nutrients and waste products.

4. The following statements relate to acid-base balance:

- a) T F Normal blood pH is maintained between 7.45-7.55.

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- b) T F The bicarbonate buffer system is the most important buffer in blood.
- c) T F Metabolic acidosis is compensated by increasing respiratory rate.
- d) T F A pH of 7.15 indicates alkalosis.

5. Kimpinde is said to be homozygous recessive and has the sickle cell trait, which of the following could be his genotype?

- a) T F Ss
- b) T F ss
- c) T F SS
- d) T F Sq

6. Regarding protein structure and function:

- a) T F Primary structure refers to the amino acid sequence.
- b) T F Denaturation leads to reversible loss of protein function.
- c) T F Enzymes lower the activation energy of reactions.
- d) T F Fever above 41°C can cause protein denaturation.

7. The major biochemical changes in diabetic ketoacidosis (DKA) include:

- a) T F Increased lipolysis leading to ketone body production.
- b) T F Blood pH decreases below 7.3.
- c) T F Insulin levels are elevated.
- d) T F Glucose is excreted in urine due to hyperglycemia.

8. Which statements are true regarding DNA and RNA?

- a) T F DNA contains thymine while RNA contains uracil.
- b) T F mRNA carries genetic information from nucleus to ribosomes.
- c) T F DNA replication occurs during the S phase of the cell cycle.

- d) T F RNA is always double-stranded.

9. Which of the following genetic conditions are correctly matched to their biochemical defect?

- a) T F Sick cell disease – point mutation in θ -globin gene causing abnormal heamoglobin.
- b) T F Tumour – decrease in p53 gene expression.
- c) T F Down syndrome – trisomy 21 chromosomal abnormality.
- d) T F Cystic fibrosis – mutation in insulin receptor gene.

10. Which the laboratory test are correctly matched to the clinical condition it helps diagnose:

- a) T F Myocardial infarction – Troponin I
- b) T F Diabetes mellitus – Serum creatinine
- c) T F Liver cirrhosis – Serum albumin
- d) T F Renal failure – Blood urea nitrogen (BUN)

11. Match the antibody to its major functional properties

- a) T F IgA – antigen receptor on Naïve B cells
- b) T F IgG – Regulation of antibody production
- c) T F IgM – recruitment of eosinophils
- d) T F IgE – fixing the compliment

12. The following are important practices for interpreting laboratory results:

- a) T F Always compare results to the reference range provided by the laboratory.
- b) T F A single abnormal result always confirms disease.
- c) T F Consider the patient's clinical presentation when interpreting lab values.

- d) T F Serial measurements are more useful than single measurements for monitoring disease.

13. A patient's lipid profile shows elevated LDL cholesterol. What further steps are appropriate?

- a) T F Assess cardiovascular risk factors including family history.
b) T F Recommend lifestyle modifications including diet and exercise.
c) T F Immediately start high-dose statin therapy without lifestyle changes.
d) T F Monitor lipid levels after 3 months of intervention.

14. Which of the following are risk factors for developing Type 2 diabetes mellitus?

- a) T F Obesity with BMI > 30 kg/m².
b) T F Family history of diabetes.
c) T F Regular physical activity.
d) T F Age above 45 years.

15. Some properties of enzymes that are important in clinical biochemistry include:

- a) T F Enzyme levels in blood increase when tissue damage occurs.
b) T F All enzymes require cofactors to function.
c) T F Enzyme activity can be measured to assess organ function.
d) T F Competitive inhibitors bind to the active site of enzymes.

16. The following are benefits of dietary fibre in the body

- a) T F Fiber aids in the digestion process by promoting regular bowel movements
b) T F Blood Sugar Control
c) T F Fiber helps lower cholesterol levels, reducing the risk of heart disease

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- d) T F High-fiber foods promote satiety

17. Listed below are the common signs of malnutrition in adults.

- a) T F Fatigue
b) T F Dry, flaky skin, and easy bruising
c) T F Hair thinning or loss.
d) T F Delayed Wound Healing

18. The impact of the Microbiome on nutrition and health includes:-

- a) T F enhancing nutrient absorption.
b) T F influence metabolic processes
c) T F production of antibodies and reducing inflammation
d) T F producing neurotransmitters that affect mood and cognitive function.

19. The following are key nutrients involved in wound healing process:-

- a) T F Carbohydrates
b) T F Proteins
c) T F Vitamin C
d) T F Zinc

20. The DASH diet is primarily designed to help manage which health condition?

- a) T F Diabetes
b) T F Hypertension
c) T F Osteoporosis
d) T F Anemia

SECTION B: [20 MARKS]

Answer all questions on separate answer sheets provided

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1. List any 5 biomarkers measured in a kidney function tests. **[5 marks]**
2. Briefly describe the biochemical reasons behind the following signs and symptoms associated with Diabetes
 - a. Polyuria
 - b. Polydipsia
 - c. Weight loss
 - d. Kussmal Breathing
 - e. Polyphagia

[5 marks]

3. Identify and describe three dietary patterns associated with improved health outcomes. **[5 marks]**
4. Explain how socioeconomic factors can influence nutritional status. Provide two examples.

[5 marks]

SECTION C: [40 marks]

Answer any 2 questions from this section on separate answer sheets provided

1. Describe in detail the fates of glucose **[20 marks]**
2. A 6 year old patient comes to the clinic with a swollen abdomen and wounds that are taking time to heal.
 - a) Describe in detail the the biochemical basis of his signs and symptoms**[10 marks]**
 - b) Discuss the tests you would order, expected results for your clinical diagnosis and a brief management.**[10 marks]**
3. Describe how problems in DNA replication, transcription, or translation can result in disease. Give TWO examples and explain what goes wrong. **[20 marks]**
4. Evaluate the impact of cultural beliefs and practices on dietary choices and nutrition. Provide two examples. **[20 marks]**