

Candidate Number.....



AFRICA
UNIVERSITY
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"Investing in Africa's Future"

**COLLEGE OF HEALTH, AGRICULTURE AND NATURAL
SCIENCES
DEPARTMENT OF BIOMEDICAL AND LABORATORY SCIENCES**

NSLS103: CLINICAL PATHOLOGY

END OF SEMESTER FINAL EXAMINATIONS

APRIL 2026

LECTURER: MR G. MALUNGA

DURATION: 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 **3** questions in section C on separate answer sheets provided
5. 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 [40MARKS]

- **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 mark**

1. The following hormones regulate the acid–base status of the blood

- | | | |
|---|---|-------------------------|
| T | F | a) Antidiuretic hormone |
| T | F | b) Renin |
| T | F | c) Cortisol |
| T | F | d) Insulin |

2. Carbon dioxide is transported in blood in the following forms

- | | | |
|---|---|----------------------------|
| T | F | a) gaseous |
| T | F | b) dissolved in the plasma |
| T | F | c) bound to haemoglobin |
| T | F | d) HCO_3^- |

3. Samples for blood gas analysis

- | | | |
|---|---|---|
| T | F | a) must be collected in blood tubes containing an anticoagulant |
| T | F | b) can be collected from veins |
| T | F | c) must be sent to the laboratory on ice |
| T | F | d) must be centrifuged before analysis |

4. The following refer to CSF composition

- | | | |
|---|---|---|
| T | F | a) Low molecular weight plasma proteins do not appear in CSF |
| T | F | b) Sodium and chloride are not present in CSF |
| T | F | c) It is normal to get occasional RBCs and WBCs in CSF |
| T | F | d) Levels of protein and glucose in CSF are higher than in plasma |

5. The following processes take place in the liver:

- | | | |
|---|---|---|
| T | F | a) amino acid synthesis and degradation |
| T | F | b) formation of coagulation factors |
| T | F | c) endocrine regulation |
| T | F | d) red cell production |

6. Clinical conditions that may be associated with ascites are

- | | | |
|---|---|---|
| T | F | a) leakage of fluid into the peritoneal cavity |
| T | F | b) increased permeability of peritoneal capillaries |
| T | F | c) Tuberculosis |
| T | F | d) Hepatocellular carcinoma |

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7. The biochemical analytes that are commonly measured in pericardial fluid, ascitic fluid and pleural fluid are

- | | | |
|---|---|-------------|
| T | F | a) Chloride |
| T | F | b) Protein |
| T | F | c) LDH |
| T | F | d) Glucose |

8. A transudative body fluid has the following laboratory findings:

- | | | |
|---|---|--------------------------|
| T | F | a) high specific gravity |
| T | F | b) high WBC |
| T | F | c) low RBC |
| T | F | d) a cloudy appearance |

9. Which electrolytes exist in large quantities in the extracellular fluid?

- | | | |
|---|---|---------------------|
| T | F | a) Na^+ |
| T | F | b) HCO_3^- |
| T | F | c) K^+ |
| T | F | d) Cl^- |

10. The female sex hormone profile of a pregnant woman consists of

- | | | |
|---|---|------------------------|
| T | F | a) Luteinizing hormone |
| T | F | b) Prolactin |
| T | F | c) Progesterone |
| T | F | d) Estradiol |

11. A Liver Function Test panel consists of

- | | | |
|---|---|----------------|
| T | F | a) LDH |
| T | F | b) ALP |
| T | F | c) AST |
| T | F | d) Transferrin |

12. With regard to plasma calcium,

- | | | |
|---|---|---|
| T | F | a) approximately 50% of the plasma calcium is present in the ionized form |
| T | F | b) approximately 90% of the plasma calcium is bound to proteins |
| T | F | c) approximately 10% of the plasma calcium is complexed with anions |
| T | F | d) a negative balance may be found in children due to bone growth |

13. Fat soluble Vitamins include

- | | | |
|---|---|--------------|
| T | F | a) Vitamin D |
| T | F | b) Vitamin K |
| T | F | c) Vitamin B |
| T | F | d) Vitamin C |

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14. The following refer to unconjugated bilirubin:

- | | | |
|---|---|---|
| T | F | a) It is found in very high amounts in urine |
| T | F | b) It is water-soluble and easily excreted by the kidney |
| T | F | c) It gives the stool the characteristic dark brown color |
| T | F | d) At high concentrations, it deposits in cell membranes causing kernicterus. |

15. A renal tubule can secrete

- | | | |
|---|---|--------------|
| T | F | a) H^+ |
| T | F | b) HCO_3^- |
| T | F | c) K^+ |
| T | F | d) Ca^{2+} |

16. In blood gas analysis,

- | | | |
|---|---|---|
| T | F | a) Actual HCO_3^- is calculated using the measured pH and pCO_2 |
| T | F | b) pCO_2 is measured with a CO_2 electrode. |
| T | F | c) pH is calculated using the measured H^+ ions |
| T | F | d) O_2 is measured with an O_2 electrode |

17. The kidneys produce the following hormones:

- | | | |
|---|---|-------------------------|
| T | F | a) Renin |
| T | F | b) Erythropoietin |
| T | F | c) Prostaglandin |
| T | F | d) Antidiuretic hormone |

18. A urine dipstick detects the following

- | | | |
|---|---|----------------|
| T | F | a) Leucocytes |
| T | F | b) Blood |
| T | F | c) Urine casts |
| T | F | d) Nitrite |

19. In metabolic acidosis, there is

- | | | |
|---|---|--|
| T | F | a) a decrease in the blood pH caused by a decrease in the bicarbonate concentration. |
| T | F | b) a decrease in the bicarbonate concentration due to accumulation of hydrogen ions. |
| T | F | c) an increase in the bicarbonate concentration |
| T | F | d) always an increase in the pCO_2 |

20. The following laboratory methods are used for the measurement of urea

- | | | |
|---|---|-----------------------------------|
| T | F | a) Jaffe chemical method |
| T | F | b) Diacetyl monoxime method |
| T | F | c) Fearon chemical method |
| T | F | d) Enzymatic method using uricase |

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SECTION B [20 MARKS]

Answer all questions on separate answer sheets provided

1. State 5 tests which can be used to assess iron status in the body. [5 marks]
- 2 a). Define
 - (i) Osmolality
 - (ii) Osmolar gap
- b). How can osmolality be calculated? [5 marks]
3. Write short notes on the use of creatinine as a renal function test. [5 marks]
4. Name five (5) laboratory tests that can be done in a bone profile. [5 marks]

SECTION C [75 marks]

Answer any 3 questions from this section on separate answer sheets provided. Each question carries 25 marks.

1. Discuss the laboratory measurement of serum Calcium. [25 Marks]
2. Explain how blood pH is maintained in the body. [25 Marks]
3. Give a detailed description of bilirubin metabolism. [25 Marks]
4. Discuss the methods that are used to measure serum creatinine in the laboratory. [25 Marks]
5. Write a detailed account of the biochemical features associated with hepatitis. [25]