

CANDIDATE NUMBER.....



*"Investing in Africa's Future"*

**COLLEGE OF HEALTH, AGRICULTURE AND NATURAL  
SCIENCES  
DEPARTMENT OF HEALTH SCIENCES  
BACHELOR OF MEDICAL LABORATORY SCIENCES HONOURS**

**NSLS103: CLINICAL PATHOLOGY**

**END OF FIRST SEMESTER EXAMINATIONS**

**NOVEMBER 2018**

**LECTURER: MR G. MALUNGA**

**DURATION: 3 HOURS**

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***INSTRUCTIONS***

Write your candidate number on the space provided on top of each page

Answer **all** questions in sections A on the question paper.

Answer **all** questions in section B on separate answer sheets provided.

Answer any **3** questions in section C on separate answer sheets provided

The mark allocation for each question is indicated at the end of the question

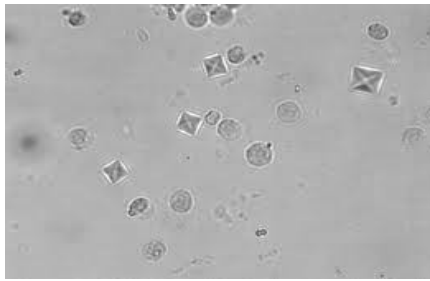
Credit will be given for logical, systematic and neat presentations in sections B and C

**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 are functions of the urinary system  
T     F     a) Excretion  
T     F     b) Water balance  
T     F     c) Acid –base balance  
T     F     d) Reproduction
2. Kidneys perform the following as a way of controlling the acid-base status of the body  
T     F     a) Rate of  $H^+$  excretion increases when plasma pH is low  
T     F     b) Reabsorption of  $HCO_3^-$  increases when plasma pH is low  
T     F     c) Rate of  $NH_4^+$  excretion increases when plasma pH is high  
T     F     d) Rate of  $Cl^-$  excretion decreases when plasma pH is high
3. Blood urea levels can be affected by  
T     F     a) Dietary protein levels  
T     F     b) Liver disease  
T     F     c) Renal insufficiency  
T     F     d) Glomerular membrane damage
4. Molecules are reabsorbed from the nephron into the capillary through  
T     F     a) Filtration  
T     F     b) Diffusion  
T     F     c) Active transport  
T     F     d) Osmosis
5. Calcium occurs in the plasma in the following forms  
T     F     a) free ion  
T     F     b) bound to albumin  
T     F     c) complexed to phosphate  
T     F     d) complexed to carbonate
6. A urine dipstick detects the following  
T     F     a) Leucocytes  
T     F     b) Blood  
T     F     c) Urine casts  
T     F     d) Nitrite

7.



**Fig 1**

The diagram in Fig 1 shows

- |   |   |                              |
|---|---|------------------------------|
| T | F | a) White Blood Cells         |
| T | F | b) Calcium Oxalates          |
| T | F | c) Granular Casts            |
| T | F | d) <i>S. haematobium</i> ova |
8. The following laboratory findings are associated with hypophosphataemia
- |   |   |                      |
|---|---|----------------------|
| T | F | a) Low Serum calcium |
| T | F | b) Low Calcitriol    |
| T | F | c) High ALP          |
| T | F | d) Hyperphosphaturia |
9. The following refers to electrolytes
- |   |   |  |
|---|---|--|
| T | F | a) $\text{Na}^+$ is the major extracellular cation           |
| T | F | b) $\text{Cl}^-$ exists in equal amounts both in ECF and ICF |
| T | F | c) $\text{K}^+$ is the major intracellular cation            |
| T | F | d) $\text{HCO}_3^-$ is an extracellular ion                  |
10. **All** Electrolytes can be measured using
- |   |   |   |
|---|---|---|
| T | F | a) Spectrophotometry                    |
| T | F | b) Ion Selective Electrodes             |
| T | F | c) Coulometric - Amperometric Titration |
| T | F | d) Enzymatic methods                    |
11. The measurement of the following analyte/s is **greatly** affected by haemolysis
- |   |   |                     |
|---|---|---------------------|
| T | F | a) $\text{K}^+$     |
| T | F | b) $\text{HCO}_3^-$ |
| T | F | c) Urea             |
| T | F | d) $\text{Cl}^-$    |
12. The following is true about blood acid-base balance
- |   |   |  |
|---|---|--|
| T | F | a) A decrease in pH can be due to high $[\text{HCO}_3^-]$  |
| T | F | b) An increase in pH can be due to low $\text{Pco}_2$      |
| T | F | c) An increase in pH can be due to high $[\text{HCO}_3^-]$ |
| T | F | d) A decrease in pH can be due to high $\text{Pco}_2$      |
13. The panel of blood gas analysis include

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|---|---|---------------------|
| T | F | a) $\text{HCO}_3^-$ |
| T | F | b) $\text{Pco}_2$   |
| T | F | c) $\text{Po}_2$    |
| T | F | d) pH               |
14. 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                          |
15. The following laboratory processes are done on a CSF sample
- |   |   |                                 |
|---|---|---------------------------------|
| T | F | a) ZN staining                  |
| T | F | b) Urea and protein measurement |
| T | F | c) WBC and RBC counts           |
| T | F | d) Geimsa staining              |
16. The biochemical analyte/s which is/are commonly measured in pericardial fluid, ascitic fluid and pleural fluid is/are
- |   |   |             |
|---|---|-------------|
| T | F | a) Chloride |
| T | F | b) Protein  |
| T | F | c) LDH      |
| T | F | d) Glucose  |
17. 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   |
18. The following are clinical tests of iron status
- |   |   |                                |
|---|---|--------------------------------|
| T | F | a) Total Iron Binding Capacity |
| T | F | b) Serum ferritin              |
| T | F | c) Serum folate                |
| T | F | d) % Iron saturation           |
19. The following are water soluble vitamins
- |   |   |                |
|---|---|----------------|
| T | F | a) Vitamin B12 |
| T | F | b) Vitamin B6  |
| T | F | c) Vitamin A   |
| T | F | d) Folic acid  |
20. Screening tests for malabsorption include
- |   |   |                     |
|---|---|---------------------|
| T | F | a) Serum vitamin B6 |
| T | F | b) Serum albumin    |

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- |   |   |               |
|---|---|---------------|
| T | F | c) Hb         |
| T | F | d) Faecal fat |

**SECTION B: [20 MARKS]**

**Answer all questions on separate answer sheets provided**

1. State the laboratory tests which can be done in a bone profile investigation. [5]
2. State any 5 limitations of serum urea test as a renal function test. [5]
3. State any 5 laboratory findings associated with iron deficiency. [5]
4. Calculate the anion gap and explain its significance, for a diabetic patient with the following laboratory results:  
 $\text{Na}^+ = 136 \text{ mmol/l}$   
 $\text{K}^+ = 5 \text{ mmol/l}$   
 $\text{Cl}^- = 97 \text{ mmol/l}$   
 $\text{HCO}_3^- = 13 \text{ mmol/l}$  [5]
5. Name any 5 aspirates which can be analyzed in a clinical laboratory. [5]

**SECTION C: [75 marks]**

**Answer any 3 questions from this section on separate answer sheets provided**

1. Explain how blood buffers function in maintaining optimal blood pH. [25]
2. Discuss how renal dysfunction can be assessed in the medical laboratory. [25]
3. Discuss the laboratory diagnosis of folate deficiency. [25]
4. Describe how a CSF sample is processed in a clinical laboratory. [25]
5. Give an overview of gastric function tests. [25]