

Candidate number.....



*"Investing in Africa's Future"*

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

**DEPARTMENT OF BIOMEDICAL AND LABORATORY SCIENCES**

**NSLS104: CLINICAL PATHOLOGY PRACTICAL**

**END OF SEMESTER FINAL EXAMINATIONS**

**NOVEMBER 2022**

**LECTURER: MRS R. CHIRIMO**

**DURATION: 3 HOURS**

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***INSTRUCTIONS***

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

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Mark allocation for each question is indicated in brackets at the end of the question

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Credit will be given for logical, systematic and neat presentations

**Answer all questions****Question 1**

A woman who is about 7 months pregnant visits an Antenatal Clinic complaining of lower abdominal pain and swollen lower limbs. The doctor asked her to produce a urine sample for protein measurement. You are required to determine the amount of protein in the urine sample labeled **P** from the woman using the following procedure.

**Urine protein determination procedure**

1. Using pH papers, test the pH of the urine. If it is neutral or alkaline, add 3 drops of glacial acetic acid to it.
2. Prepare a pair of test tubes for the standard and a pair for the sample **P** as shown in Table 1 below. Label one tube B (for blank) and the other one T (for the test). The provided protein standard solution has a protein concentration of 45 g/l

**Table 1: Preparation of reaction tubes**

	<b>PROTEIN STANDARD</b>		<b>URINE SAMPLE P</b>	
	<b>BLANK(B)</b>	<b>TEST(T)</b>	<b>BLANK(B)</b>	<b>TEST(T)</b>
SULPHOSALICYLIC ACID (SSA)	-	1.5 ml	-	1.5 ml
DEIONISED WATER	1.5 ml	-	1.5 ml	-
URINE SAMPLE P	-	-	1.0 ml	1.0 ml
PROTEIN STANDARD	1.0 ml	1.0 ml	-	-

3. Mix the contents of each tube thoroughly and leave them for 5 minutes.
4. Remix the pair of the protein standard tubes and immediately set the spectrophotometer at zero absorbance with the B tube at 590 nm. Read and record the absorbance of the corresponding T tube.
5. Repeat step 4 for the pair of the urine sample tubes.
6. Carry out a semi-quantitative determination of the protein in urine **P** using the provided urine dipsticks and record your results.

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### Questions

- a) Why is alkaline urine not suitable for the SSA method? [2]
- b) Record your absorbance results for the protein standard and urine sample in the form of a table. [20]
- c) Calculate the concentration of protein in urine P. [5]
- d) Record your protein results from the semi-quantitative determination of the urine protein. [5]
- e) Explain your results in relation to the symptoms presented by the woman. [3]
- f) Which other laboratory tests can be done on the urine in order to come up with a definite diagnosis? [5]

**TOTAL MARKS: 40**

### Question 2

You are required to carry out a microscopy examination and biochemical analysis of a urine sample labeled U from a 52 year-old woman complaining of painful urination. Use the following procedure.

#### Procedure

1. Pour the provided urine into a conical centrifuge tube to about two thirds full.
2. Note the appearance of the urine.
3. Dip a urine reagent strip into the urine and record the biochemical findings.
4. Centrifuge the urine in a centrifuge at 2500 rpm for 5 minutes.
5. Decant the supernatant completely.
6. Resuspend the sediment by tapping the bottom of the tube and transfer one drop of the sediment onto a microscope glass slide and cover with a cover slip.
7. Examine the wet preparation using a microscope starting with the 10 x objective and then move on to the 40 X objective.
8. Record your findings.

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**Questions**

**a) Record the appearance of the urine. [1]**

**b) Record the following biochemical findings of the urine. [22]**

Leucocytes

Nitrite

Urobilinogen

Protein

pH

Blood

Specific Gravity

Ketones

Bilirubin

Glucose

**c) Record the following microscopy findings of the urine. [25]**

WBC

RBC

Epithelial cells

Yeasts

Casts

Crystals

S. haematobium

Others

**d) What diagnosis can you make from your results? Support your diagnosis with your results? [12]**

**TOTAL: 60 MARKS**