AFRICA UNIVERSITY
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COLLEGE OF HEALTH, AGRICULTURE AND NATURAL SCIENCES

DEPARTMENT OF BIOMEDICAL AND LABORATORY SCIENCES

NSLS104: CLINICAL PATHOLOGY PRACTICAL

END OF SECOND SEMESTER FINAL EXAMINATIONS

APRIL/MAY 2022

LECTURER: MR G. MALUNGA

22 APRIL 2022 0900 HRS

DURATION: 3 HOURS

INSTRUCTIONS

Answer **all** questions on the separate answer sheet provided.

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

Credit will be given for logical, systematic and neat presentations

Question 1

A woman who is about 8 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 **M** 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 **M** 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 35 g/l

Table 1: Preparation of reaction tubes

	PROTEIN STANDARD		URINE SAMPLE **M**	
	BLANK	TEST	BLANK	TEST
SULPHOSALICYLIC ACID (SSA)	-	1.5 ml	-	1.5 ml
DEIONISED WATER	1.5 ml	-	1.5 ml	-
URINE SAMPLE **M**	-	-	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 **M** using the provided urine dipsticks and record your results.

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 **M**. [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 55 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 10X objective and then move on to the 40X objective.
8. Record your findings.

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