AFRICA UNIVERSITY
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COLLEGE OF HEALTH, AGRICULTURE AND NATURAL SCIENCES

DEPARTMENT OF HEALTH SCIENCES

BACHELOR OF MEDICAL LABORATORY SCIENCES HONOURS

SLS104: CLINICAL PATHOLOGY PRACTICALS

END OF SECOND SEMESTER SUPPLEMENTARY EXAMINATIONS

APRIL/MAY 2019

LECTURER: MR G. MALUNGA

DURATION: 3 HOURS

INSTRUCTIONS

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

Question 1

You are provided with a cerebrospinal fluid (CSF) which was withdrawn from a patient complaining of fever, headache, stiff neck and intolerance of light. You are required to measure the amount of total protein in the CSF using the Colorimetric trichloroacetic acid method.

Procedure

A .Preparation of a calibration graph

1. You are provided with a protein standard labelled **P** and its protein concentration is 20g/l. Take 5 test tubes and number them S1 to S5. Pipette into each tube the following volumes of physiologic saline and the protein standard to prepare protein standards S1 to S5

	SI	S2	S3	S4	S5
Physiologic saline /ml	2.5	2.0	1.5	1.0	0.5
Protein standard/ml	0.5	1.0	1.5	2.0	2.5

2. Mix thoroughly the contents of each test tube.
3. Take another set of 5 test tubes and number them ST1 to ST5. Pipette 2.4 ml of trichloroacetic acid into each numbered test tube
4. Add 0.8 ml of the protein standard solution S1 into the trichloroacetic acid in test tube numbered ST1. Do the same for standards S2 to S5.
5. Mix the contents of each test tube numbered ST1 to ST5 and leave for 5 minutes.
6. Remix each test tube and read the absorbance of each tube in a colorimeter at wavelength 450 nm. Zero the colorimeter with Trichloroacetic acid. Record the absorbances of each tube.

B. Measuring the total protein concentration in the CSF sample

1. Pipette 2.4 ml of trichloroacetic acid solution into a tube.
2. Add 0.8 ml of CSF to the tube and leave for 5 minutes.
3. Remix the contents of the tube and read the absorbance of the precipitated protein in a colorimeter at a wavelength of 450 nm. Zero the instrument with distilled water.
4. Read off the concentration of the CSF protein in g/l from the prepared calibration graph.

Questions

a) Calculate the protein concentration of each of the standard solutions numbered S1to S5. [10]
b) Record the absorbance of each of the contents in tubes numbered ST1 to ST5. [10]
c) Take a sheet of graph paper and prepare a calibration curve by plotting the absorbances of each of the solutions numbered ST1 to ST5 against the concentration of the corresponding protein standard. Draw a straight line passing through the points. [10]
d) Record the absorbance of the CSF sample and use your calibration curve to determine the concentration of protein in the CSF. [5]
e) Given that the normal CSF total protein is 0.15 – 0.40 g/l, use your result and the given symptoms of the patient to give a probable explanation for the symptoms of the patient.[10]

TOTAL: 45 MARKS

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.

Questions

a) Record the appearance of the urine. [2]
b) Record the following biochemical findings of the urine. [20]
   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 the diagnosis with your results ?. [8]

TOTAL: 55 MARKS