

**BOWEN UNIVERSITY, IWO**  
(Of the Nigerian Baptist Convention)

**COLLEGE OF HEALTH SCIENCES**

**MEDICAL LABORATORY SCIENCE PROGRAMME**

**2023/2024 SECOND SEMESTER EXAMINATION**

**MLS 202: INTRODUCTION TO MEDICAL LABORATORY SCIENCE II**

**INSTRUCTION: ANSWER ANY FOUR (4) QUESTIONS**

**TIME: 2HRS**

**START EACH QUESTION ON A NEW PAGE**

1. A) A 22-year woman present at Bowen University Teaching Hospital (BUTH) with clinical history of frequent urination, burning sensation during urination (dysuria), fatigue, fever, excessive thirst and weight loss. The result of her urine analysis revealed the following:

- *Physical Examination: Colour (Dark Yellow); Appearance (Cloudy)*
- *Chemical Examination: Specific gravity (1.030); PH (8.5); Protein (Neg); Ketone (Pos); Glucose (Pos); Nitrite (Pos); Leukocytes (Pos); Others (Neg)*

- i) Name the appropriate urine specimen for the test with this result **(1 mark)**
- ii) List two (2) most probable diagnoses for this woman **(2 marks)**
- iii) Justify each of the stated diagnoses above respectively **(6 marks)**

B) Describe any eight (8) Quality System Essentials described by Clinical Laboratory Standard Institute (CLSI) that are required to act as building blocks for developing a Quality Management System (QMS) **(16 marks)**

2. A) A patient presents at Bowen University Teaching Hospital (BUTH) with the a history of following symptoms: Coughing up of blood and mucus, Chest pain, Fever, Night sweats and Weight loss.

- i) Name one (1) Differential diagnosis for this patient **(2 marks)**
- ii) Name one diagnostic technique that can be used to confirm your diagnosis **(2 marks)**
- iii) Describe both the principle and the procedures involved in performing this technique **(6 marks)**

B) A breast tumour sample obtained from a 55-year old woman was sent to the Histopathology Laboratory of Bowen University Teaching Hospital (BUTH) to confirm possible metastasis. Describe the processes the sample must go through in order to produce a tissue block. **(15 marks)**

3. A) Describe the following terms:

- |                                 |                                 |
|---------------------------------|---------------------------------|
| i) Negative Staining Technique  | vi) Quantitative Analysis       |
| ii) Positive Staining Technique | vii) Laboratory Technique       |
| iii) Metaplasia                 | viii) Autolysis                 |
| iv) Hypertrophy                 | ix) Forward Pipetting Technique |
| v) Qualitative analysis         | x) Autopsy                      |
- (20 marks)**

B) List five (5) criteria under which clinical samples could be rejected in a Histopathology and Cytopathology Laboratory **(5 marks)**

4. A) A 70-year old man presents at Bowen University Teaching Hospital (BUTH) with clinical history of frequent urination, excessive thirst, weight loss and extreme hunger.

- |   |                  |
|---|------------------|
| i) What is the likely test you would recommend for the patient? | <b>(2 marks)</b> |
| ii) What sample would you collect from the patient?             | <b>(2 marks)</b> |
| iii) Describe the principle of the test you would recommend     | <b>(4 marks)</b> |

B) With the aid of a diagram, describe the following:

- |                                |                  |
|--------------------------------|------------------|
| i) An automatic pipette        | <b>(3 marks)</b> |
| ii) Swab stick                 | <b>(3 marks)</b> |
| iii) Cover slip or Glass slide | <b>(3 marks)</b> |
| iv) Bunsen burner              | <b>(3 marks)</b> |
| v) Wire loop                   | <b>(3 marks)</b> |

5. A) State Beer-Lambert law? **(3 marks)**

B) List any four (4) analytical techniques that are used in a Clinical Chemistry (Chemical Pathology) Laboratory **(4 marks)**

C) With four (4) examples, Describe Romanowsky stains **(4 marks)**

D) Describe how the differences in bacterial cell structure affects the staining outcomes of Romanowsky stains **(2 marks)**

E) Define the term "fixatives" **(2 marks)**

F) List five (5) properties of an ideal fixative **(5 marks)**

G) List any five (5) consequences of delayed, imprecise and inaccurate results of medical laboratory investigations **(5 marks)**