



AFRICA
UNIVERSITY
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"Investing in Africa's Future"

COLLEGE OF HEALTH, AGRICULTURE AND NATURAL SCIENCES
DEPARTMENT OF BIOMEDICAL AND LABORATORY SCIENCES

MLS1101: LABORATORY PRINCIPLES

END OF SEMESTER EXAMS

NOVEMBER 2025

LECTURER: MR G. MALUNGA

DURATION: 3 HOURS

INSTRUCTIONS

1. Write your candidate number on the space provided on top of each page and on the answer script you will submit
 2. Answer **all** questions in sections A on this question paper.
 3. Answer **all** questions in section B on a separate answer sheet provided.
 4. Answer any **3** questions in section on a separate answer sheet provided.
 5. The mark allocation for each question is indicated at the end of the question
 6. Credit will be given for logical, systematic and neat presentations in sections B and C
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SECTION A: MULTIPLE CHOICE [40 MARKS]

- **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 uses of medical laboratory tests

- T F a) Prognosis
T F b) Screening
T F c) Research
T F d) Patient management

2. The following methods reduce transmission of infectious material from the laboratory

- T F a) Wearing laboratory coats or gowns outside the laboratory
T F b) Disinfecting work benches before and after work
T F c) Restricting entry to the laboratory to authorized personnel only
T F d) Disposing sample waste together with office waste

3. The laboratory sign shown below can be found on the containers of the following chemicals



- T F a) Potassium permanganate
T F b) Sulphuric acid
T F c) Benzoic acid
T F d) Iodine

4. The following information must always be available on the laboratory request form

- T F a) Age of patient
T F b) Method of payment and medical insurance details
T F c) Clinical Data
T F d) Sex of patient

5. The following urine samples are acceptable in a laboratory

- T F a) Bedpan urine
T F b) Suprapubic urine

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- T F c) Terminal urine
T F d) Catheterized urine
- 6. The following is true about laboratory disinfectants**
T F a) 1% NaClO can be used to disinfect work benches
T F b) 0.1% NaClO can be used to disinfect a blood sample spillage
T F c) 100% alcohol can be used to disinfect skin
T F d) 90% alcohol can be prepared from a 70% alcohol solution.
- 7. The following are some laboratory acquired infections that laboratory personnel need to be vaccinated against**
T F a) HIV
T F b) Hepatitis B Virus
T F c) Human Papilloma Virus
T F d) COVID-19
- 8. The following are common blood sample preservatives and their colour codes**
T F a) EDTA
T F b) Heparin
T F c) Boric acid
T F d) Sodium fluoride
- 9. When collecting a urine sample for urine chemistries, microscopy and culture, it is important that patients**
T F a) collect mid-stream urine
T F b) clean the genital area to avoid contamination
T F c) avoid eating for at least 12 hours
T F d) avoid taking antibiotics before collection of the sample
- 10. Before purchasing a piece of equipment, the following parameters should always be considered**
T F a) Accuracy
T F b) Precision
T F c) Sensitivity
T F d) Specificity
- 11. The following documents are crucial for a chemistry analyzer**
T F a) Daily maintenance chart
T F b) Service records
T F c) Levey-Jennings Chart
T F d) Room Temperature Chart

12. The objective lens on a microscope

- T F a) controls contrast
- T F b) increases the magnification of material on a slide
- T F c) is also called a field diaphragm
- T F d) scatters light from the bulb

13. Which of the following is a method of decontamination

- T F a) UV radiation
- T F b) 100% Formaldehyde
- T F c) Ethylene oxide
- T F d) 1% Sodium hypochlorite

14. During centrifugation of a sample, separation of particles is affected by

- T F a) particle shape
- T F b) volume of sample
- T F c) differences between density of particles and the liquid
- T F d) speed of revolutions

15. When sorting samples that are coming into the laboratory,

- T F a) match the name of the patient on the form and the sample
- T F b) ensure that the sample meets the acceptance criteria
- T F c) acknowledge time and date of receipt of sample
- T F d) refrigerate all samples to ensure sample integrity.

16. Regarding left over samples after a test

- T F a) they should be immediately thrown away to prevent contamination
- T F b) they should be thrown down the drain or dustbin
- T F c) they can be kept in freezers and used for future research
- T F d) they should be immediately autoclaved to prevent further contamination

17. The following variables affect the total turnaround time in a clinic-laboratory interface

- T F a) availability of reagents
- T F b) transport system from clinic to laboratory
- T F c) medium used to dispatch results from laboratory
- T F d) quality of specimens sent to the laboratory

18. The following practices ensure efficient workflow on a laboratory bench

- T F a) SOPs or Bench Aides for tests done
- T F b) following the 5S approach
- T F c) Having reference ranges close to the testing area

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T F d) keeping stock of reagents and materials used.

19. The following are examples of laboratory records that must be found in the laboratory

T F a) Laboratory worksheets

T F b) Equipment service reports

T F c) Personnel evaluation reports

T F d) Personnel Curriculum Vitae

20. Principles of Good Clinical Laboratory Practice include

T F a) Stock management

T F b) Proficiency testing

T F c) Continuous professional development

T F d) Customer surveys

SECTION B [20 MARKS]

Answer all questions on separate answer sheets provided

1. State any 5 pieces of information which must be indicated on an Equipment Record Form. [5 marks]
2. Describe how you can make 3 litres of 0.5 mol/l H_2SO_4 from a stock solution of H_2SO_4 which has a label with the following information:
90% H_2SO_4
MW = 98.08
1L = 1.84Kg (Density) [5 marks]
3. Name any 5 causes of laboratory accidents. [5 marks]
4. List 5 essential details that should be filled in on a laboratory request form. [5 marks]

SECTION C [75 marks]

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

- 1.** As a Laboratory Manager you have just purchased a new haematology analyzer for your laboratory. Explain how you will make sure it is kept in good working condition? [25 marks]

- 2.** Your clients have lost confidence in your laboratory and are no longer bringing samples. Discuss how establishing a Quality Management System can improve services at the laboratory. [25 marks]

- 3.** You have been asked to help design a Bio-safety level 2 laboratory. Discuss issues you will put into consideration. [25 marks]

- 4.** Discuss post exposure prophylaxis for laboratory personnel. [25 marks]

- 5.** Describe the packaging of a highly infectious sample that is about to be referred to a central medical laboratory for processing. [25 marks]

THE END