

CANDIDATE NUMBER.....



**AFRICA
UNIVERSITY**
A United Methodist-Related Institution

"Investing in Africa's Future"

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

BACHELOR OF MEDICAL LABORATORY SCIENCES HONOURS DEGREE

NSLS100: LABORATORY PRINCIPLES

END OF FIRST SEMESTER FINAL EXAMINATIONS

NOVEMBER 2019

LECTURER: MR G. MALUNGA

DURATION: 3 HOURS

INSTRUCTIONS

1. Write your candidate number on the space provided on top of each page
2. Answer **all** questions in sections A on the question paper.
3. Answer **all** questions in section B on separate answer sheets provided.
4. Answer any **3** questions in section C on separate answer sheets 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

SECTION A : MULTIPLE CHOICE [40MARKS]

- **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. Screening tests

- | | | |
|---|---|--|
| T | F | a) are an important part of preventative health care |
| T | F | b) must be more sensitive than diagnostic tests |
| T | F | c) must always be confirmed with diagnostic tests |
| T | F | d) are used to detect subclinical diseases |

2.



Fig 1

The symbol shown in Fig 1 can be found on containers of the following substances

- | | | |
|---|---|------------------------|
| T | F | a) Phenol |
| T | F | b) Sodium hypochlorite |
| T | F | c) Sodium hydroxide |
| T | F | d) Hydrochloric acid |
3. First aid is meant to
- | | | |
|---|---|------------------------|
| T | F | a) treat the victim |
| T | F | b) save life |
| T | F | c) promote recovery |
| T | F | d) diagnose the victim |
4. According to Standard 5 (Testing) of the code of ethics, all Medical laboratory scientists shall
- | | | |
|---|---|--|
| T | F | a) not fabricate patient results |
| T | F | b) ensure the accuracy of patient results |
| T | F | c) follow institutional protocol for specimen collection |
| T | F | d) implement ISO15189 standards |

CANDIDATE NUMBER.....

5. A chemical spill response center must have the following
- T F a) goggles
 - T F b) rubber apron
 - T F c) vacutainer needles
 - T F d) alcohol swabs
6. The following is true about laboratory disinfectants
- T F a) 1% NaClO can be used to disinfect a chemistry analyzer
 - T F b) 0.1% NaClO can be used to disinfect a urine sample spillage
 - T F c) 70% alcohol can be used to disinfect skin
 - T F d) 70% alcohol can be prepared from a 50% alcohol solution.
7. Management of HIV Post Exposure Prophylaxis in a health care worker involves
- T F a) offering first aid to the health care worker
 - T F b) counselling the patient who supplied the blood sample
 - T F c) initiating the exposed healthcare worker on ARVs
 - T F d) testing the exposed health care worker for Hepatitis B.
8. The following are common blood sample preservatives
- T F a) EDTA
 - T F b) Heparin
 - T F c) Oxalate
 - T F d) Boric acid
9. Medical microbiology specimens
- T F a) must never be refrigerated
 - T F b) can be collected by the patient on his/her own.
 - T F c) for parasitology must always be preserved with 10% formalin
 - T F d) can still be collected even after commencing the patient on antibiotic treatment
10. Which performance characteristic must be considered when purchasing an equipment
- 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) Temperature Chart

CANDIDATE NUMBER.....

12. The iris diaphragm on a microscope
T F a) controls contrast
T F b) controls light aperture
T F c) is also called a field diaphragm
T F d) scatters light from the bulb
13. Micropipettes can be decontaminated by
T F a) UV radiation
T F b) 10% 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) type of centrifuge
15. A spectrophotometer
T F a) measures transmittance of light through coloured substances
T F b) uses wavelength of light within the visible range only
T F c) is similar to a flame photometer
T F d) must never be used without blanking
16. The following is true about balances
T F a) Never place a hot object on a balance pan
T F b) Balances can be used to calibrate volumetric equipment
T F c) A top loading pan must not be used in a clinical laboratory
T F d) Tarring must always be used on a balance
17. The following variables affect quality of results in a clinical laboratory
T F a) reporting of results
T F b) quantity of specimen
T F c) interpretation of results
T F d) education background of the laboratory scientist
18. The following must be always available on a workbench
T F a) SOPs
T F b) Equipment owner's manual
T F c) Clinician contact numbers
T F d) Personnel files

19. The following are examples of laboratory records
- | | | |
|---|---|---------------------------------|
| T | F | a) Laboratory worksheets |
| T | F | b) Equipment service reports |
| T | F | c) Personnel evaluation reports |
| T | F | d) Delivery Notes |
20. Good laboratory practice involves
- | | | |
|---|---|--|
| 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. Why are ethics critical in the medical laboratory field? [5]
2. The following table shows blood glucose levels of a diabetic patient measured on consecutive days during one week.

Table 1: Blood glucose levels of a diabetic patient

Day	[Glucose]mmol/l
Monday	15.6
Tuesday	14.7
Wednesday	14.9
Thursday	13.4
Friday	14.7
Saturday	15.6
Sunday	16.3

- (a). Calculate the mean Glucose concentration for the patient during the one week period. [2]
 - (b). Calculate the standard deviation. [3]
3. State any 5 consequences of a poor laboratory equipment maintenance program. [5]
 4. What is the value of documentation in a clinical laboratory? [5]

CANDIDATE NUMBER.....

SECTION C [75 marks]

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

- 1.** Discuss the finger prick procedure. [25]
- 2.** Describe the packaging of a highly infectious sample which is about to be referred to a central medical laboratory for processing. [25]
- 3.** If you were a laboratory manager of an international medical laboratory, explain how you would acquire a good hematology analyzer and maintain it in good working condition. [25]
- 4.** Discuss quality assurance in a clinical laboratory. [25]
- 5.** Explain the role of a clinical laboratory in the medical field. [25]