

CANDIDATE NUMBER.....



"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 EXAMINATIONS

NOVEMBER 2018

LECTURER: MR G. MALUNGA

DURATION: 3 HOURS

INSTRUCTIONS

Write your candidate number on the space provided on top of each page

Answer **all** questions in sections A on the question paper.

Answer **all** questions in section B on separate answer sheets provided.

Answer any **3** questions in section C on separate answer sheets 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 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 |
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 |
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 |

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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. Outline how to prepare 500 ml of 0.02 mol/l Hydrochloric acid from a 98% Hydrochloric acid solution with a specific gravity of 1L = 1.16 Kg. [5]
[A_r : H = 1 ; Cl = 35.5]
3. State any 5 consequences of a poor equipment maintenance program. [5]
4. What is the value of documentation in a clinical laboratory? [5]

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]