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"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

JUNE 2019

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

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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. A clinical laboratory

- | | | |
|---|---|--|
| T | F | a) deals with the diagnosis of all human diseases |
| T | F | b) processes human specimens in aiding disease diagnosis |
| T | F | c) is only found in a medical center |
| T | F | d) help in achieving cost effectiveness in medical care |

2. The following are uses of laboratory tests

- | | | |
|---|---|---|
| T | F | a) Prevention of spreading of diseases |
| T | F | b) Management of disease outbreaks |
| T | F | c) Detection of subclinical diseases |
| T | F | d) Confirmation of a diagnosis made by a doctor |

3. Laboratory accidents may be caused by

- | | | |
|---|---|---------------------------------------|
| T | F | a) Using sub-standard equipment |
| T | F | b) Lack of knowledge |
| T | F | c) Working in a hazardous environment |
| T | F | d) Not opening laboratory windows |

4. According to Standard 1 (Professional responsibility)of the code of ethics, all medical laboratory scientists shall

- | | | |
|---|---|---|
| T | F | a) Respect individual values and beliefs |
| T | F | b) Protect confidentiality of all patient information |
| T | F | c) Be allowed to operate their own private laboratories |
| T | F | d) Practice within the scope of their professional competence |

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5. The following are ways of minimizing the spreading of infectious agents in a medical laboratory

T F a) Washing hands thoroughly
T F b) Disposing medical waste appropriately
T F b) Always wearing gloves when on workbenches
T F c) Wearing labcoats even when going out of the lab

6. The sign shown in Fig 1 is used on



Fig 1

- T F a) Biohazardous materials
T F b) Corrosive substances
T F c) Toxic substances
T F d) Harmful substances
7. Which of the following actions is **NOT** a safety practice
- T F a) Re-capping of needles
T F b) Mouth pipetting
T F c) Keeping samples locked in a secure place
T F d) Washing hands before and after collecting a blood sample
8. An adequately equipped laboratory must have
- T F a) An emergency shower
T F b) Serviced fire extinguishers
T F c) Heaters and fans
T F d) A Material Safety Data Sheets file
9. When designing the floor plan of a medical laboratory, the following should be taken into consideration
- T F a) Flexibility
T F b) Accessibility
T F c) Number of laboratory personnel working in the laboratory
T F d) Functional relationships

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10. When using a micropipette
- T F a) Its volume can be adjusted beyond its range of measurement
 - T F b) Never force the volume adjuster dial
 - T F c) It's not necessary to keep it upright
 - T F d) Disposable tips can be recycled
11. The following information should always appear on a laboratory request form
- T F a) Sex
 - T F b) Age
 - T F c) Specimen type
 - T F d) Name of laboratory manager
12. Levels of analytes in a blood sample can be affected by
- T F a) Physical stress
 - T F b) Emotional stress
 - T F c) Gender
 - T F d) Age
13. Which statement best describes how to prepare a 4%(w/v) NaCl
- T F a) Dissolving 40g of NaCl in 1000ml distilled water
 - T F b) Dissolving 0.4g of NaCl in 100ml distilled water
 - T F c) Dissolving 4g of NaCl in 100ml distilled water
 - T F d) Dissolving 0.4g of NaCl in 1000 distilled water
14. The following are causes of laboratory accidents
- T F a) Lack of skills
 - T F b) Negligence
 - T F c) Using dirty equipment
 - T F d) Using plastic ware instead of glassware
15. The following laboratory tests must be done before starting a person on HIV Post Exposure Prophylaxis(PEP)
- T F a) HIV antibody testing
 - T F b) Syphilis screening
 - T F c) Full Blood Count
 - T F d) Urinalysis
16. If a test has a specificity of 90% it results in approximately

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- T F a) 90% false positives
- T F b) 90% false negatives
- T F c) 10% false positives
- T F d) 10% false negatives

17. The following statements relate to SI units used in a clinical laboratory

- T F a) 1 ml = 1000 μ l
- T F b) 1 g = 1000 μ g
- T F c) 1 mol = 1000 mmol
- T F d) 1 cm = 10 000 μ m

18. Good equipment management involves

- T F a) Proper selection of equipment
- T F b) Regular maintenance of equipment
- T F c) Proper usage of equipment
- T F d) Placing of equipment in a good position

19. The following variables affect the quality of results in a medical

- T F a) Reporting of results
- T F b) Gender of laboratory personnel
- T F c) Results interpretation
- T F d) Type of specimen

20. The stock-levels which need to be constantly monitored in a logistics systems are

- T F a) Maximum stock-level
- T F b) Minimum stock-level
- T F c) Re-order level
- T F d) Average level

SECTION B: [20 MARKS]

Answer all questions on separate answer sheets provided

1. State any 5 uses of medical laboratory tests in the medical field. [5]
2. The label on a container of concentrated Nitric acid (HNO_3) has the

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following information:

HNO₃ 96%

1 L = 1.18 kg

M_r(HNO₃) = 63

- (a). Calculate the molarity of the concentrated HNO₃. [3]
- (b). Calculate the volume of the concentrated HNO₃ required to make 500ml of 0.2 mol/l HNO₃. [2]

- 3. (a) Define accuracy and precision in relation to micropipettes. [2]
(b) State any 3 causes of leaks in micropipettes. [3]
- 4. State any 5 reasons which can cause the rejection of a urine sample for culture and sensitivity. [5]

SECTION C : [75 marks]

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

- 1. Discuss the causes of errors in a clinical laboratory. [25]
- 2. If you were a laboratory manager how would you implement an equipment maintenance program in your laboratory? [25]
- 3. Discuss the importance of having a good documents and records management system in a laboratory. [25]
- 4. How is quality of results monitored in a medical laboratory. [25]
- 5. Compare and contrast internal quality control and external quality control. [25]