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

NSLS100: LABORATORY PRINCIPLES

END OF FIRST SEMESTER SUPPLEMENTARY EXAMINATIONS

January 2020

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

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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 disciplines are part of Microbiology
   - T F a) Virology
   - T F b) Parasitology
   - T F c) Haematology
   - T F d) Mycology

2. Which of the following is **NOT** a Good Clinical Laboratory Practice
   - T F a) Testing a patient for HIV without consent
   - T F b) Long turn-around times of results
   - T F c) Employing untrained laboratory general staff
   - T F d) Quality assurance program

3. Where do laboratory scientists need to apply ethics
   - T F a) When talking to patients
   - T F b) Behavior of staff in the laboratory
   - T F c) When collecting specimens from patients
   - T F d) When processing patients' samples

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

5. The following are ways of minimizing transmittance of infectious agents in the laboratory
   - T F a) Swabbing benches after finishing work only
   - T F b) Wearing labcoats even when going outside the laboratory
   - T F c) Wearing gloves only when handling microbiology samples
   - T F d) Answering a phone call while wearing gloves

6. The following statements are true of sharps containers
   - T F a) Shake the containers often to create space
   - T F b) Seal and remove them when ¾ full
   - T F c) They are used to collect sharps for re-use
   - T F d) Keep all used containers in a safe place to avoid contamination

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7.

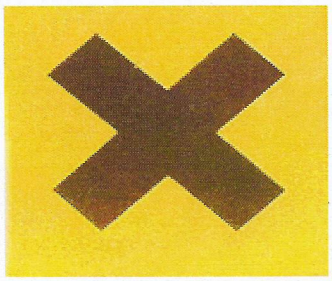

Fig 1

The sign in Fig is used on

T F a) Toxic substances
T F b) Harmful substances
T F c) Corrosive substances
T F d) Biohazard materials

8. Some of the causes of laboratory accidents are

T F a) Lack of knowledge
T F b) Using cheap materials
T F c) Negligence
T F d) Poor laboratory layout

9. An adequately equipped laboratory **must** have the following

T F a) Fire extinguishers
T F b) Eyewash station
T F c) First aid kit
T F d) Heaters

10. The following laboratory tests must be done before starting a person on HIV Post Exposure Prophylaxis

T F a) Full Blood Count
T F b) Rapid HIV Test
T F c) Blood Sugar Test
T F d) Hepatitis B Screen

11. Which statement best describes how to prepare a 0.5%(v/v) NaClO solution from a 5%(v/v) NaClO

T F a) Mix 1 part NaClO with 9 parts water
T F b) Mix 9 parts NaClO with 1 part water
T F c) Mix 1 part NaClO with 10 parts water
T F d) Mix 10 parts NaClO with 90 parts water

12. If a test has a specificity of 95% it results in approximately

T F a) 95% false positives
T F b) 95% false negatives
T F c) 5% false positives
T F d) 5% false negatives

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13. Variables which affect the quality of laboratory results are
    T F a) Educational background of laboratory personnel
    T F b) Interpretation of results
    T F c) Transcription of results
    T F d) Biosafety level of the laboratory

14. The following are consequences of producing poor laboratory results
    T F a) Degrading of the laboratory to a lower Biosafety level
    T F b) Loss of credibility of the laboratory
    T F c) Mistreatment
    T F d) Legal action

15. Benefits of an equipment management program include
    T F a) Lower repair costs
    T F b) Shorter turn-around times of results
    T F c) Good customer satisfaction
    T F d) Medical laboratory scientists getting higher salaries

16. The following are common objective lenses on a simple medical laboratory microscopy
    T F a) 4X
    T F b) 40X
    T F c) 50X
    T F d) 100X

17. When using a micropipette
    T F a) Its volume can be adjusted beyond its range of measurement
    T F b) It's not necessary to keep it upright
    T F c) Disposable tips can be recycled
    T F d) You can use a P200 disposable tip on a 1000µl micropipette

18. 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) Site of specimen collection

19. The stock-levels which need to be constantly monitored in stock management are
    T F a) Maximum stock-level
    T F b) Minimum stock-level
    T F c) Re-order level
    T F d) Average level

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20. 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 between departments

SECTION B [20 MARKS]

Answer all questions on separate answer sheets provided

1. Define
   (a) Quality assurance
   (b) Quality control
   (c) Specificity
   (d) Sensitivity
   (e) Precision

[5]

2. (a) Name any two basic laboratory equipments. [2]
   (b) State how any one of the named equipments is maintained in a laboratory. [3]

3. List any 5 benefits of implementing an equipment management program in a clinical laboratory. [5]

4. The label on a container of concentrated Nitric acid (HNO_3) has the following information:

HNO_3 96%
1 L = 1.18 kg
M_r(HNO_3) = 63

   (a). Calculate the molarity of the concentrated HNO_3. [3]
   (b). Calculate the volume of the concentrated HNO_3 required to make 500ml of 0.2 mol/l HNO_3. [2]

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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. How can safety be maintained in a clinical laboratory? [25]
3. What is the role of a clinical laboratory in a hospital? [25]
4. Discuss the areas which need to be taken into consideration when designing the floor plan of a laboratory. [25]
5. Discuss the importance of having a good documents and records management system in a laboratory. [25]