CANDIDATE NUMBER.....

AFRICA UNIVERSITY
A United Methodist Related Institution

"Investing in Africa's Future"

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

BACHELOR OF MEDICAL LABORATORY SCIENCES HONOURS DEGREE

NSLS100: LABORATORY PRINCIPLES

END OF SEMESTER FINAL EXAMINATIONS

NOVEMBER 2023

LECTURER: DR MAIBOUGE SALISSOU

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.
- 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.

CANDIDATE NUMBER.....

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. 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. 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

5. 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

6. 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

CANDIDATE NUMBER.....

7. **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

8. **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

9. **Timing of post-exposure prophylaxis**

T F a) When there is a risk of HIV transmission, post-exposure prophylaxis should be initiated as soon as possible, within hours
T F b) It can also be initiated after 72 hours following the potential exposure.
T F c) Post-exposure prophylaxis should be provided following significant exposure of mucous membranes
T F d) The counselling should include information about the importance of adherence and the possibility of side effects

10. **Policy in lab management should**

T F a) Tell "what to do" in a broad and general way
T F b) include the organizational mission, goals, and purpose
T F c) serve as the framework for the quality system
T F d) should not always be specified in the quality manual

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. **Suggested Outline for SOPs should have the following**

T F a) Name of Test and its Medical use
T F b) Preexamination and Examination only
T F c) References to verify the method is established
T F d) Author's name Approval signature(s)–initial and date

13. **For laboratory safety the following hold true**

T F a) Shock symptoms include: pallor, a cool "clammy" forehead and dizziness.
T F b) To treat for shock: Place the victim on the floor and cover with a coat or blanket.
T F c) The victim's legs should not be elevated
T F d) If a limb is bleeding, bandage it securely and elevate it above the level of the heart until medical assistance arrives

14. Using Spectrophotometers

T F a) Blank is measured first, and used to set instrument's absorbance to zero or % transmittance to 100
T F b) The sample(s) is/are only analyzed after the instrument has been "blanked"
T F c) The instrument must be blanked every time the wavelength is changed, and periodically even when the wavelength has not been changed
T F d) Blanking compensate the Absorption of light by analyte

15. Biological hazards

T F a) Biological hazards are materials that might be infectious.
T F b) Look for warnings on materials used to transport, handle, or store potentially infectious agents
T F c) Use leak proof color-coded bags
T F d) Use of Autoclave is not essential prior to disposal.

16. For thermal burns

T F a) Cover the flames with a jacket or fire blanket and "pat" or "roll" the person to smother the fire
T F b) Do not let an ignited person stand in a fire blanket
T F c) Remove loose, smoldering, clothing.
T F d) Should remove clothing that is adhered to the skin.

17. For urine parasitology

T F a) Preferred specimen is Urine passed at about 10am – 12 noon after morning exercise.
T F b) A midstream urine can be use
T F c) Volume Requirements 20 mls
T F d) Specimen can be refrigerated at 4°C - 8°C

18. 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

CANDIDATE NUMBER.....

19. 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) Dissolving0.4g 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

20. 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

SECTION B [20 Marks]

Answer all questions on separate answer sheets provided

1. **a)** Define accuracy and precision in relation to micropipettes. [2]
   b) State any 3 causes of leaks in micropipettes. [3]

2. Name any 5 blood sample preservatives [5]

3. Outline the preparation of the following solution: 1L of 1% sodium hypochlorite solution using a 5% sodium hypochlorite stock solution [5]

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. Compare and contrast internal quality control and external quality control. [25]
2. Discuss the general rule for use of balance [25]
3. Discuss the causes of errors in a clinical laboratory. [25
4. Discuss post exposure prophylaxis for laboratory personnel
5. Discuss finger prick procedure