

CANDIDATE NUMBER.....



“Investing in Africa’s Future”

FACULTY OF HEALTH SCIENCES

2015 FIRST SEMESTER FINAL EXAMINATIONS

COURSE CODE: SLS 100

COURSE TITLE: LABORATORY PRINCIPLES

DATE: NOVEMBER 2015

TIME: 3 hours

INSTRUCTIONS

Answer **all** questions in sections A on the question paper.
Answer **all** questions in section B on separate answer sheets provided.
Answer any **4** 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 or F for each statement in all the questions**
- **Each correct response is allocated half mark**

1. Medical laboratory tests are used for
A. Diagnosis of diseases T or F
B. Prescription of certain drugs for patients T or F
C. Screening of diseases T or F
D. Prevention of spreading of diseases T or F
2. Good Clinical Laboratory Practice involves
A. Implementation of quality assurance programs T or F
B. Using standard operating procedures T or F
C. Good record keeping T or F
D. Long turn-around times T or F
3. When testing patient samples , medical laboratory scientists should
A. Ensure the accuracy of their analysis T or F
B. Not worry about reference ranges for the test results T or F
C. Understand the principle of the test T or F
D. Exercise caution T or F
4. According to Standard 1 (Professional responsibility)of the code of ethics, all medical laboratory scientists shall
A. Respect individual values and beliefs T or F
B. Protect confidentiality of all patient information T or F
C. Be allowed to operate their own private laboratories T or F
D. Practice within the scope of their professional competence T or F
5. The following are ways of minimizing the spreading of infectious agents in a medical laboratory
A. Washing hands thoroughly T or F
B. Disposing medical waste appropriately T or F
C. Always wearing gloves when on workbenches T or F
D. Wearing lab coats even when going out of the lab T or F

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Fig 1

6. The sign shown in Fig 1 is used on
- | | |
|---------------------------|--------|
| A. Biohazardous materials | T or F |
| B. Corrosive substances | T or F |
| C. Toxic substances | T or F |
| D. Harmful substances | T or F |
7. Which of the following actions is **NOT** a safety practice
- | | |
|---|--------|
| A. Re-capping of needles | T or F |
| B. Mouth pipetting | T or F |
| C. Keeping samples locked in a secure place | T or F |
| D. Washing hands before and after collecting a blood sample | T or F |
8. An adequately equipped laboratory must have
- | | |
|---------------------------------------|--------|
| A. An emergency shower | T or F |
| B. Serviced fire extinguishers | T or F |
| C. Heaters and fans | T or F |
| D. A Material Safety Data Sheets file | T or F |
9. When designing the floor plan of a medical laboratory, the following should be taken into consideration
- | | |
|---|--------|
| A. Flexibility | T or F |
| B. Accessibility | T or F |
| C. Number of laboratory personnel working in the laboratory | T or F |
| D. Functional relationships | T or F |
- laboratory equipment should
10. When using a micropipette
- | | |
|---|--------|
| A. Its volume can be adjusted beyond its range of measurement | T or F |
| B. Never force the volume adjuster dial | T or F |
| C. It's not necessary to keep it upright | T or F |
| D. Disposable tips can be recycled | T or F |
11. The following information should always appear on a laboratory request form
- | | |
|-------------------------------|--------|
| A. Sex | T or F |
| B. Age | T or F |
| C. Specimen type | T or F |
| D. Name of laboratory manager | T or F |

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12. Levels of analytes in a blood sample can be affected by
- A. Physical stress T or F
 - B. Emotional stress T or F
 - C. Gender T or F
 - D. Sex T or F
13. Which statement best describes how to prepare a 4%(w/v) NaCl
- A. Dissolving 40g of NaCl in 1000ml distilled water T or F
 - B. Dissolving 0.4g of NaCl in 100ml distilled water T or F
 - C. Dissolving 4g of NaCl in 100ml distilled water T or F
 - D. Dissolving 0.4g of NaCl in 1000 distilled water T or F
14. The following are causes of laboratory accidents
- A. Lack of skills T or F
 - B. Negligence T or F
 - C. Using dirty equipment T or F
 - D. Using plastic ware instead of glassware T or F
15. The following laboratory tests must be done before starting a person on HIV Post Exposure Prophylaxis(PEP)
- A. HIV antibody testing T or F
 - B. Syphilis screening T or F
 - C. Full Blood Count T or F
 - D. Urinalysis T or F
16. If a test has a specificity of 90% it results in approximately
- A. 90% false positives T or F
 - B. 90% false negatives Tor F
 - C. 10% false positives T or F
 - D. 10% false negatives T or F
17. The following statements relate to SI units used in a clinical laboratory
- A. 1 ml = 1000 μ l T or F
 - B. 1 g = 1000 μ g T or F
 - C. 1 mol = 1000 mmol T or F
 - D. 1 cm = 10 000 μ m T or F
18. Good equipment management involves
- A. Proper selection of equipment T or F
 - B. Regular maintenance of equipment T or F
 - C. Proper usage of equipment T or F
 - D. Placing of an equipment in a good position T or F

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19. The following variables affect the quality of results in a medical laboratory
- A. Reporting of results T or F
 - B. Gender of laboratory personnel T or F
 - C. Results interpretation T or F
 - D. Type of specimen T or F
20. The stock-levels which need to be constantly monitored in a logistics systems are
- A. Maximum stock-level T or F
 - B. Minimum stock-level T or F
 - C. Re-order level T or F
 - D. Average level T or F

SECTION B: [20 MARKS]

Answer all questions on separate answer sheets provided

1. Define
- (a) Quality assurance
 - (b) Quality control
 - (c) Specificity
 - (d) Sensitivity
- [5 marks]
2. The label on a container of concentrated Nitric acid (HNO_3) has the following information:
- HNO_3 96%**
1 L = 1.18 kg
 $M_r(\text{HNO}_3) = 63$
- (a) Calculate the molarity of the concentrated HNO_3 . [3]
 - (b) Calculate the volume of the concentrated HNO_3 required to make 500 ml of 0.2 mol/l HNO_3 . [2]
3. (a) Define accuracy and precision in relation to micropipettes. [2]
(b) State any 3 causes of leaks in micropipettes. [3]

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4 .The following table shows blood glucose levels of a diabetic patient measured on consecutive days during one week.

Day	[Glucose]mmol/l
1	14.7
2	15.2
3	12.9
4	14.8
5	15.4
6	16.7
7	16.4

(a) Calculate

- (i)** The mean blood glucose concentration for the patient during the one week period. [2]
- (ii)** The standard deviation. [3]

SECTION C : [40 marks]

Answer any 4 questions from this section on separate answer sheets provided

- 1.** Discuss the role of a clinical laboratory in the medical field. [10]
- 2** .How can safety be maintained in a clinical laboratory? [10]
- 3** .Discuss the causes of errors in a clinical laboratory. [10]
- 4** .If you were a laboratory manager how would you implement an equipment maintenance program in your laboratory? [10]
- 5.**Discuss the importance of having a good documents and records management system in a laboratory. [10]