NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH, NATURAL RESOURCES AND APPLIED SCIENCES

SCHOOL OF HEALTH SCIENCES

DEPARTMENT OF CLINICAL HEALTH SCIENCES

QUALIFICATION: BACHELOR OF MEDICAL LABORATORY SCIENCES	
QUALIFICATION CODE: 08BMLS	**LEVEL:** 5
COURSE CODE: IML511S	**COURSE NAME:** INTRODUCTION TO MEDICAL LABORATORY SCIENCE
SESSION: JULY 2023	**PAPER:** THEORY
DURATION: 3 HOURS	**MARKS:** 100

SUPPLEMENTARY/SECOND OPPORTUNITY EXAMINATION QUESTION PAPER	
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INSTRUCTIONS
1. Answer ALL the questions. 2. Write clearly and neatly. 3. Number the answers clearly.

PERMISSIBLE MATERIALS

1. Scientific calculator

THIS QUESTION PAPER CONSISTS OF 5 PAGES (Including this front page)

SECTION A (40 MARKS)

QUESTION 1 **[10]**

Evaluate the statements in each numbered section and select the most appropriate answer or phrase from the given possibilities. Write the appropriate letter next to the number of the statement/phrase.

1.1 A nurse collects a blood sample from a patient, as requested by the doctor. The next step in the flow of work in the lab, is: (1)

(A) The medical laboratory scientist (MLS) enters the test result into the laboratory information system (LIS)
(B) A data typist enters the information on the request form, into the LIS
(C) The doctor fills in a request form in writing
(D) A laboratory number is assigned, and a barcode is attached to the tube

1.2 The MLS does a test in the lab. The next step in the flow of work in the lab, is: (1)

(A) The result is printed automatically
(B) The MLS enters the result into the LIS
(C) The printout is sealed in an envelope, and a driver delivers it to the doctor/ward
(D) The chief MLS signs off the result manually

1.3 The following is true of ethics, except: (1)

(A) Using vulgar language or wearing unprofessional clothes is unethical
(B) Sometimes it is used to refer to the practices or beliefs of a group of people, like Christian ethics or medical ethics
(C) Sometimes it refers to the standards and behaviour of a group as it is described in the group's code of professional conduct
(D) The concept may also refer to a method of enquiry, to understand the moral aspects of human behaviour

1.4 The following are factors that influence successful lab design, except: (1)

(A) Personal preferences
(B) The purpose of the lab
(C) The physical location of the lab
(D) Efficient flow of sample analysis and results
(E) Lab staffing

1.5 The best type of fire extinguisher to use in a laboratory with sensitive electronic equipment is thefollowing: (1)

(A) Stored-pressure water extinguisher
(B) Aqueous film forming foam extinguisher
(C) Carbon dioxide extinguisher
(D) Dry chemical extinguisher

1.6 Blood specimens are acceptable for laboratory testing, when: (1)

(A) There is no patient name or identification on the tube
(B) The label on the request form and the label on the collection container do not match
(C) The phlebotomist has written the patient's name on the collection tube
(D) The wrong collection tube has been used eg anticoagulant additive instead of tube for serum

1.7 The following appearance of processed blood interferes with all light-based tests: (1)

(A) Haemolysis
(B) Icteric samples due to increased bilirubin
(C) Lipaemia after a fatty meal
(D) All of the above

1.8 Reverse osmosis refers to the following treatment of water: (1)

(A) Using either anion / cation exchange resin
(B) Impurities remain in boiling apparatus
(C) Water pumped across a semi-permeable membrane
(D) Submicron filters remove substances larger than the pores of the filter, eg bacteria

1.9 To convert 5.0 gram NaCl to milligram, the following method is followed: (1)

(A) Move the decimal three places to the right
(B) Move the decimal three places to the left
(C) Multiply by 10
(D) Divide by 1000

1.10 A sudden change in the performance of a control of 1 or 2 standard deviations, is called: (1)

(A) A bias
(B) A shift
(C) A trend
(D) Imprecision

QUESTION 2 **[10]**

Assess the following statements and decide whether they are true or false. Write only the number of the question and TRUE for a true statement or FALSE for a false statement next to the number of the question.

2.1 Donated blood is not tested for any diseases before it is transfused to the recipient. (1)

2.2 The Allied Health Professions Council is there to ensure that the public gets the care needed, by competent MLS. (1)

2.3 The Allied Health Professions Council is there to support MLS to perform their activities effectively. (1)

2.4. A MLS may give a result to a sister in the ward where the patient is. (1)

2.5 Medical records, such as request forms and test reports, are not legal documents and may be altered. (1)

2.6 It is not necessary to consult a doctor if the eyewash station was used immediately to treat an accidental splash of serum in the eye. (1)

2.7 For some instruments, it is not necessary to put reagents back into the fridge – they can be kept on board till finished. (1)

2.8 0.5 ml serum is mixed with 9.5 ml diluent. The resulting dilution is 1 to 10. (1)

2.9 The quality system must be an integrated part of daily work. (1)

2.10 If a control value is out of range, the MLS may start testing patient samples and do corrective action later. (1)

QUESTION 3 **[20]**

Define / briefly describe the following terms

3.1 Histology (2)

3.2 Cardiac markers (2)

3.3 Erythrocyte sedimentation rate (ESR) (2)

3.4 Viral load (2)

3.5 A standard used in spectrophotometry (2)

3.6 Personal protective clothing (2)

3.7 Contaminated/hazardous waste (2)

3.8 Two examples of clinical laboratory waste (2)

3.9 Pathogens (2)

3.10 Reference range for a test (2)

SECTION B (60 MARKS)

QUESTION 4 **[20]**

4.1 List the different professions which can be found in a medical laboratory. Start with the lowest rank. (6)

4.2 Explain why controls are run at the beginning of each shift in haematology. (3)

4.3 Name two organs of which the function is tested most commonly in clinical chemistry. (2)

4.4 Mention four (4) steps which are included in analysis of a specimen in the medical microbiology lab. (4)

4.5 Identify five (5) steps used to prevent contamination in a molecular diagnostics lab. (5)

QUESTION 5 **[10]**

5.1 Name two safety measurements that should be considered when designing a lab. (2)

5.2 List the three (3) factors that need to be present for a fire to start. (3)

5.3 Describe things that you should do when a fire starts. (4)

5.4 Provide the acronym that indicates how a fire extinguisher should be handled. (1)

QUESTION 6 **[12]**

6.1 Name three (3) things you should NOT do when using a microscope. (3)

6.2 Give three (3) examples of temperature-controlled instruments in the clinical laboratory. (3)

6.3 List three (3) things to keep in mind when using an automated pipette. (3)

6.4 Discuss the effect of water distillation on the quality of water. (3)

QUESTION 7 **[5]**

Use Beer's law to calculate the glucose concentration in a patient sample (unknown):

Unknown (patient) absorbance	0.508
Standard absorbance	0.320
Standard concentration	5.6 mmol/L

QUESTION 8 **[5]**

8.1 Describe a situation in the clinical laboratory when a dilution needs to be made. (1)

8.2 0.2 ml of serum is mixed with 1 ml saline and 1 ml reagent. What is the dilution? What is the dilution factor? (2)

8.3 A patient serum tested outside the linear range of an instrument. The serum is diluted 1 to 4 and re-run. The re-analyzed result is 2 mmol/L. What is the final patient result that needs to be reported to the doctor? (2)

QUESTION 9 **[8]**

9.1 Define four (4) areas of error that may occur on a Levey-Jennings chart (4)

9.2 Give one possible cause of each of the areas of error in 9.1. (4)

END OF QUESTION PAPER. GOOD LUCK!