THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF HEALTH

ASSESSMENT PLANS FOR TECHNICIAN CERTIFICATE (NTA LEVEL 5) IN MEDICAL LABORATORY SCIENCES

Ministry of Health
Government City, Mtumba
Afya Road,
P. O BOX 743
40478 DODOMA.
Phone No: +255 026 – 2323267
Email: ps@afya.go.tz
Website: https://www.moh.go.tz

October 2022

Published by the Ministry of Health

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

ACD	-	Acid Citrate Dextrose
AFB	-	Acid Fast Bacilli
AIDS	-	Acquired Immunodeficiency Syndrome
BRELA	-	Business Registration and Licensing Agency
CA	-	Continuous Assessment
CBET	-	Competence Based Education Training
CD	-	Cluster of Differentiation/Designate.
COHAS	-	College of Health and Allied Sciences
CPD	-	Citrate phosphate dextrose
CPDA	-	Citrate phosphate dextrose adenine
CSF	-	Cerebral Spinal Fluid
CSR	-	Corporate Social Responsibility
DMO	-	District Medical Officer
EQA	-	External Quality Assessment
eHMIS	-	electronic Health Management Information System
GoTHoMIS	-	Government of Tanzania Hospital Management Information System
GPA	-	Grade Point Average
HIV	-	Human Immunodeficiency Virus
HLPC	-	Health Laboratory Practitioners Council
HSSP	-	Health Sector Strategic Plan
IQA	-	Internal Quality Assessment
LMIS	-	Logistic Management Information System
MLT	-	Medical Laboratory Technology
MOH	-	Ministry of Health
MOI	-	Medical Officer in charge
MPS	-	Malaria Parasites
MSD	-	Medical Store Department
MTUHA	-	Mfumo wa Taarifa za Uendeshaji wa Huduma za Afya
MUHAS	-	Muhimbili University of Health and Allied Sciences
NACTVET	-	National Council for Technical and Vocation Education and Training
NC	-	Non-conformance
NEMC	-	National Environment Management Council
NTA	-	National Technical Awards
OSHA	-	Occupational Safety and Health Authority
PEP	-	Post Exposure Prophylaxis
PESTEL	-	Political, Economic, Social, Technological, Environmental and Legal factors
pH	-	Potential of Hydrogen ions.
PHLB	-	Private Health Laboratories Board

PPM	-	Planned Preventive Maintenance.
PPRA	-	Public Procurement Regulatory Authority
PR	-	Practical
QA	-	Quality Assurance
QC	-	Quality Control.
QSE	-	Quality System Essentials
Rh	-	Rhesus factor
SE	-	Semester Examination
SEO	-	Sub-enabling outcome
SOP	-	Standard Operating Procedure
SOPs	-	Standard operating procedures
SWOC	-	Strengths, Weakness, Opportunities and Challenge
SWOT	-	Strengths, Weakness, Opportunities and Threats
TAT	-	Turn Around time
TB	-	Tuberculosis
TMDA	-	Tanzania Medicines and Medical Devices Authority
TRA	-	Tanzania Revenue Authority
TTIs	-	Transfusion Transmittable Infections
WBC	-	White Blood Cells
WHO	-	World Health Organization
WR	-	Written
ZN	-	Ziehl Neelsen

ACKNOWLEDGEMENT

The development of these Assessment Plans for Technician Certificate (NTA level 5) in Medical Laboratory Sciences programme is an outcome of collaborative efforts of the Ministry of Health (MoH), National Council for Technical and Vocational Education and Training (NACTVET) and tutors from various Health Training Institutions.

I would like to appreciate in particular, the hard work of Dr. Fadhil Lyimo, Assistant Director for Human Resource Development; and Dr. Joseph Mwabusila and Mr. Innocent Chinguile, Coordinators in the Directorate of Human Resource Development for their collaboration in thought and process to organize, coordinate and guide the development of these assessment plans.

The Ministry is also grateful to Mr. Manase Nsunza Principal Health Laboratory Scientist -Tutor MOCOHAS, Mr. Mzelifa Daud, Principal, Kolandoto College - Mwanza campus, Mr. Remelius Katalibahwa Karaba-Tutor DECCA College of Health and Allied Sciences, Mwajuma Ibrahim – Tutor City COHAS, Irene F. Alex- Health Lab. Scientist MNH- Mloganzila, Byamungu Z. Petro Tutor St. Francis University College of Health and Allied Sciences, Omary K. Michael Tutor Tanga-COHAS, Esther Ngolo Nilla, Tutor-Muhimbili-COHAS, Protas B. Mrosso- Tutor Mvumi Institute, Godfrey R. Hongoli-Tutor Muhimbili University of Health and Allied Sciences, Brayson Mbwambo_Tutor Morogoro COHAS for their commendable work towards development of these assessment plans.

I also wish to acknowledge the contributions of Mr. Twaha Twaha from NACTVET for his commitment and technical support during the development of these assessment plans.

Dr. Loishooki Saitore Laizer
Director of Human Resources Development

EXECUTIVE SUMMARY

The assessment plans, included in this document, have been prepared by the Ministry of Health in collaboration with the National Council for Technical and Vocational Education and Training (NACTVET) to assist and guide the implementation of the curriculum for Technician Certificate (NTA level 5) in Medical Laboratory Sciences.

The plans are meant to facilitate and harmonize the assessment of learning outcomes among students across the country. The learning outcomes stipulated within the NTA level 5 curriculum shall be the basis of the assessment of the student competences. The assessors are required to use the assessment plan relevant for each module to assess learning outcomes stipulated within the Technician Certificate **(**NTA level 5) in Medical Laboratory Sciences curriculum flexibly based on the student's ability to show competence involving application of knowledge and skills in a broad range of work activities most of which are routine.

This document contains assessment plans for six (6) modules of semester I and five (5) modules for semester II as stipulated in the curriculum for Technician Certificate (NTA Level 5) in Medical Laboratory Sciences which was approved by the NACTVET in May, 2022 to be implemented starting in the academic year 2022/2023 until the next review of the curriculum.

Module Code : MLT05101

Name of the Module: Laboratory Logistics Management
QUALIFICATION: NTA Level 5 - Technician Certificate in Medical Laboratory Sciences.

1.0 INTRODUCTION:

This Assessment Plan has been prepared by the Ministry of Health (MoH) in collaboration with the National Council for Technical and Vocational Education and Training (NACTVET) for the module MLT05101 Laboratory Logistics Management

The Assessment Plan is one of the tools for implementing competence-based education and training (CBET) curricula. The assessor therefore, shall assess learning outcomes stipulated within the NTA level 5 curriculum flexibly based on the student's ability to show competence involving application of knowledge and skills in a broad range of work activities most of which are routine.

This Assessment Plan was developed in October 2022 from an NTA level 5 curriculum which was approved in May 2022. It has two components of the module to be assessed. These components are Continuous Assessment (CA) which will carry 40% of the module weight; and Semester Examination (SE) which will carry the remaining 60% of the module weight.

This Assessment Plan contains sub-enabling outcomes with related tasks that shall be tested in Continuous Assessment (CA) and Semester Examination (SE). A tick (√) which appears in either CA or SE column indicates the period when the task shall be assessed. Where a tick (√) appears in both CA and SE columns, the task shall be assessed in both. Tasks requiring long term accomplishment shall be assessed during the continuous assessment (CA). Other tasks require short time to accomplish; therefore, they shall be assessed during the semester examination (SE). Some tasks, which are common and cover daily laboratory practice of the Assistant Health Laboratory Technologist after completion of this module, shall be assessed in both CA and SE. The assessor shall focus on those core areas of competences as stipulated in the curriculum.

2.0 ENABLING AND SUB-ENABLING OUTCOMES

The following Table shows the enabling and sub enabling outcomes of the module to be assessed

Enabling Outcomes	Sub-Enabling Outcomes
1.1 Apply concept of Logistics system to manage laboratory practice	1.1.1 Describe logistics system in health service delivery
	1.1.2 Describe Procurement processes in health facilities
	1.1.3 Apply skills of procurement in evaluation of quotation for equipment and supplies in health facilities
1.2 Apply process of equipment/instruments and supplies acquisition to manage Laboratory operations	1.2.1 Describe equipment/instruments and supplies acquisition process in the laboratory set up
	1.2.2 Describe selection criteria for equipment/instruments and supplies in the laboratory set up
	1.2.3 Apply knowledge and skills of selection criteria to develop specifications of equipment/instruments and supplies during procurement
1.3 Apply knowledge and skills of Logistics to manage Laboratory store	1.3.1 Describe systems of ordering equipment/instruments and supplies in health facilities
	1.3.2 Describe processes of receiving equipment/instrument and supplies in health facilities
	1.3.3 Describe concept of minimum and maximum stock levels in supplies management
	1.3.4 Apply concept of maximum and minimum stock levels of supplies management in health facilities according to guidelines
	1.3.5 Apply logistic tools and guidelines to manage stocks in the laboratory
	1.3.6 Describe process for disposal of obsolete health commodities in Tanzania
1.4 Apply concept of Logistics Management Information System (LMIS) in Laboratory practices	1.4.1 Describe Logistics Management Information System of commodities in health facilities
	1.4.2 Describe logistic management tools for ordering commodities in health facilities

	1.4.3 Apply knowledge and skills of LMIS to determine required quantity of commodities in health facilities

3.0 HOW TO USE THIS ASSESSMENT PLAN

Each task/competence specified in the Table below, will be assessed separately.
The tasks will be assessed during assignment, Theory and practical tests/ examinations.
Broader tasks (indicated by √ in both Columns for CA&SE) will be assessed in CA and SE based on this assessment plan.

Table below clarify how the sub-enabling outcomes and their related tasks will be assessed.

S/N	Sub-enabling Outcomes and Associated Task	Competence to be Assessed				66	
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams	
	Sub-enabling Outcome:					**CA**	**SE**
	1.1.1 Describe logistics system in health service delivery					66	53
1.	**Tasks**:						
	a) Define terms; Logistics system, pipeline, lead-time, issues voucher, consumption data, inventory log	√				√	
	b) Explain types of logistic system			√		√	√
	c) Explain key activities in Logistics system (Logistic Cycle)			√		√	√
	d) Explain the importance of Effective Logistics system in health sector			√		√	√
	e) Explain the importance of inventory log in supplies management			√		√	√
	f) Outline the importance of reviewing inventory log	√				√	√
2.	**Sub-enabling Outcome;** 1.1.2 Describe Procurement processes in health facilities **Tasks:**						
	a) Define terms; procurement and purchasing	√				√	
	b) Distinguish between Procurement and Purchasing			√		√	√
	c) Explain Public Procurement			√		√	√
	d) Explain stages to follow in procurement			√		√	√
	e) Describe Public Procurement Regulation Authority (PPRA)			√		√	√

3.	**Sub-enabling Outcome:** 1.1.3 Apply skills of procurement in evaluation of quotation for equipment and supplies in health facilities **Tasks**						
	a) Explain methods of procurement (*Quotation and Tender*).			√		√	√
	b) Describe evaluation process of quotation			√		√	√
	c) Explain importance of evaluation in procurement process			√		√	√
	d) Develop quotation form for equipment and supplies		√			√	√
	e) Evaluate received quotation from supplier		√			√	
4	**Sub-enabling Outcome:** 1.2.1 Describe equipment and instruments and supplies acquisition process in the laboratory set up **Tasks**						
	a) Define acquisition of equipment/instruments	√				√	
	b) Explain process of acquiring equipment/instruments and supplies			√		√	√
	c) Explain importance of post installation testing and verification of equipment/instruments			√		√	√
5	**Sub-enabling Outcome:** 1.2.2 Describe selection criteria for equipment/instruments and supplies in the laboratory set up **Tasks**						
	a) List selection criteria for laboratory equipment/instruments and supplies (*infrastructure, environmental condition, safety, staff skill, simplicity of operation, client workload, reagent availability, total cost of ownership, supplier/vendor support, calibration and maintenance requirement*)	√				√	
	b) Explain the role of facility infrastructure and environmental condition before selecting equipment/instrument			√		√	√
	c) Explain importance of considering staff skill and equipment simplicity of operation before selecting equipment/instrument			√		√	√
	d) Explain importance of assessing client's workload and total cost of ownership before selecting equipment/instrument			√		√	√
	e) Explain importance of assessing supplier/vendor support and calibration/maintenance requirement			√		√	√

	before selecting equipment/instrument						

6	**Sub-enabling Outcome:** 1.2.3 Apply knowledge and skills of selection criteria to develop specifications of equipment/instruments and supplies during procurement **Tasks**						
	a) Explain technical specifications of an equipment/instruments and supplies			√		√	√
	b) List important components of good technical specifications (*Equipment description, intended use, performance characteristics or features, physical dimensions, power consumptions*)	√				√	√
	c) Develop specifications for laboratory equipment/ instruments and supplies		√			√	
7	**Sub-enabling Outcome:** 1.3.1 Describe systems of ordering equipment/instruments and supplies in health facilities **Tasks**						
	a) Define Smart Push and Pull system as applied to MSD	√				√	
	b) Explain advantages and disadvantages of each system			√		√	√
	c) List examples of products supplied under Pull system (*equipment and reagents with long shelf-life*)	√				√	√
	d) List examples of products supplied under smart push system (*hematological reagents and controls, some equipment and reagents offered by programme like CD^4 machines*)	√				√	√
8	**Sub-enabling Outcome:** 1.3.2 Describe processes of receiving equipment/instrument and supplies in health facilities **Tasks**						
	a) Explain composition of Supplies Receiving Committee for equipment/instrument and supplies in health facilities			√		√	√
	b) Explain roles of Supplies Receiving Committee for equipment/instrument and supplies in health facilities			√		√	√
	c) Explain criteria for receiving equipment/instrument and supplies in health facilities (*e.g. right commodity, accompanying documents, quality, quantity, integrity, place, time*)			√		√	√
	d) List essential documents required for receiving laboratory equipment/instrument and supplies (*order form, Parking list, sales invoice/receipt, goods*	√				√	√

	received/delivery note, verification and claims form)						
	e) Describe criteria for visual inspection of received products (*expiry date, quantity, leakage, specification…*)			√		√	√
9	**Sub-enabling Outcome:** 1.3.3 Describe the concept of minimum and maximum stock levels in supplies management **Tasks**						
	a) Define terms: Minimum stock level, Maximum stock levels, Safety Stock, months of stock, lead time, emergency order, re-order level, bin card, ledger book	√				√	
	b) Explain importance of; maximum and minimum stock levels, months of stock, ledger book, bin cards, lead time and re-order level			√		√	√
	c) List factors influencing emergency ordering of laboratory supplies	√				√	√
10	**Sub-enabling Outcome:** 1.3.4 Apply concept of maximum and minimum stock levels of supplies management in health facilities according to guidelines **Tasks**						
	a) Determine factors for placing an order (*re-order level, minimum stock level, lead time and new user needs*)			√		√	
	b) Calculate minimum stock/re-order level		√			√	√
	c) Calculate Maximum stock level		√			√	√
	d) Perform stock taking to determine months of stock		√			√	
11	**Sub-enabling Outcome:** 1.3.5 Apply logistic tools and guidelines to manage stocks in the laboratory **Tasks**						
	a) Explain logistic tools used to monitor stock in the laboratory (*Bin card, ledger book, request and issue voucher, verification and claim form Report and Request form, Requisition and Issue Voucher*)			√		√	√
	b) Explain storage conditions of health commodities as per guidelines			√		√	√
	c) Describe process for conducting a physical inventory/counts			√		√	√
	d) Conduct physical inventory count		√			√	
	e) Prepare and use store ledger		√			√	√
	f) Prepare and use bin cards		√			√	√

12	**Sub-enabling Outcome:** 1.3.6 Describe process for disposal of obsolete health commodities in Tanzania **Tasks**						
	a) Define terms; health commodity, obsolete, disposal	√				√	
	b) List health commodities (*medicines, reagents, supplies and equipment/instruments*)	√				√	
	c) Explain disposal procedures of obsolete health commodities in Tanzania			√		√	√
	d) Explain role of governing boards in disposal of health commodities (*TMDA, NEMC and Ministry of Finance*)			√		√	√
	e) Explain importance of obtaining approval from the Ministry of Finance before disposal			√		√	√
13	**Sub-enabling Outcome:** 1.4.1 Describe Logistics Management Information System of commodities in health facilities **Tasks**						
	a) Explain LMIS and its purpose			√		√	√
	b) List essential data items for Health Supply Chain Management (*Consumption data, issue data, damaged/lost data, transferred data*)	√				√	√
	c) Describe the types of LMIS currently in use in Tanzania – (*paper based, electronic*)			√		√	√
	d) Describe the movement of LMIS in Tanzania (*Procedure from the facility to MSD e.g., from laboratory, DMO, MOI, MSD, etc.*)			√		√	√
14	**Sub-enabling Outcome:** 1.4.2 Describe logistic management tools for ordering commodities in health facilities **Tasks**						
	a) Explain paper-based Request and Report (R&R) form used to order supplies			√		√	√
	b) List key information required in filling R&R	√				√	√
	c) Explain the steps to order supplies using Electronic Logistics Management Information System (eLMIS)			√		√	√

15	**Sub-enabling Outcome:** 1.4.3 Apply knowledge and skills of LMIS to determine required quantity of commodities in health facilities **Tasks**						
	a) Explain Quantification process			√		√	√
	b) Explain the link between LMIS and product quantification			√		√	√
	c) Explain the relationship between LMIS and control of theft in health facility			√		√	√
	d) Explain health commodities redistribution process			√		√	√
	e) Conduct Quantification of health commodities using consumption data and budget		√			√	

4.0 ASSESSSMENT INSTRUCTIONS

This section describes number of examinations in a module for both Continuous Assessment (CA) and Semester Examination (SE), duration, number of questions, marks allocation and sections for each component of assessment.

It consists of two parts of the assessment; Continuous Assessment and Semester Examination. Continuous assessment shall be conducted throughout the semester and contribute 40% of the module weight and Semester Examination shall be conducted at the end of semester and contribute 60% of the module weight.

4.1 Continuous Assessment

4.1.1 Module weight

The continuous assessment shall contribute 40% of the total module weight. There shall be two (2) components of continuous assessments;

a) Written tests shall contribute 35% of the total weight
b) Assignments shall contribute 5% of the total weight

4.1.2 Duration of assessments

The duration of each written test shall be two and half (2½) hours

4.1.3 Number of questions, marks distributions and sections

a) Written tests

There shall be minimum of two written examinations. The continuous written assessment examination shall have five sections; A, B, C, D and E

i. Section A shall comprise of twenty (20) Multiple Choice Questions each having 5 options with a total of 20 marks (1 mark for each question)
ii. Section B shall comprise of four (4) Multiple True/False Questions each having 5 statements with a total of 10 marks (1/2 mark for each statement)
iii. Section C shall comprise of two (2) Matching Item Questions each with 5 premises and 8 responses with a total of 10 marks (5 marks for each question)
iv. Section D shall comprise of six (6) Short Answer Questions with a total of 30 marks (score for each question shall be 5 marks)
v. Section E shall comprise of two (2) Guided Essay Questions with a total of 30 marks (15 marks for each question)

In all sections candidates shall be required to answer **ALL** questions

b) Assignments

i. There shall be two individual written assignments
ii. The assignment format will depend on the nature of competency to be assessed.
iii. Note: Objective questions are NOT ALLOWED to be assessed in the assignment.

4.2 Semester Examination

4.2.1 Module weight

The semester examination shall contribute 60% of the total module weight.

4.2.2 Duration of assessments

The duration of written examination shall be two and half (2½) hours.

4.2.3 Number of questions, marks distributions and sections

Written examination

The semester examination shall have five sections: A, B, C, D and E:

i. Section A shall comprise of twenty (20) Multiple Choice Questions each having 5 options with a total of 20 marks (1 mark for each question)
ii. Section B shall comprise of four (4) Multiple True/False Questions each having 5 statements with a total of 10 marks (0.5 marks for each statement)
iii. Section C shall comprise of two (2) Matching Item Questions each with 5 premises and 8 responses with a total of 10 marks (5 marks for each question)
iv. Section D shall comprise of six (6) Short Answer Questions with a total of 30 marks (score for each question shall be 5 marks)
v. Section E shall comprise of two (2) Guided Essay Questions with a total of 30 marks (15 marks for each question)

In all sections candidates shall be required to answer **ALL** questions.

Module Code : MLT05102

Name of the Module: Maintenance and Calibration of Laboratory Instruments and Equipment

QUALIFICATION: NTA Level 5 - Technician Certificate in Medical Laboratory Sciences.

1.0 INTRODUCTION:

This Assessment Plan has been prepared by the Ministry of Health (MoH) in collaboration with the National Council for Technical and Vocational Education and Training (NACTVET) for the module MLT05102 Maintenance and Calibration of Laboratory Instruments and Equipment

The Assessment Plan is one of the tools for implementing competence-based education and training (CBET) curricula. The assessor therefore, shall assess learning outcomes stipulated within the NTA level 5 curriculum flexibly based on the student's ability to show competence involving application of knowledge and skills in a broad range of work activities most of which are routine.

This Assessment Plan was developed in October 2022 from an NTA level 5 curriculum which was approved in May 2022. It has two components of the module to be assessed. These components are Continuous Assessment (CA) which will carry 40% of the module weight; and Semester Examination (SE) which will carry the remaining 60% of the module weight.

This Assessment Plan contains sub-enabling outcomes with related tasks that shall be tested in Continuous Assessment (CA) and Semester Examination (SE). A tick (√) which appears in either CA or SE column indicates the period when the task shall be assessed. Where a tick (√) appears in both CA and SE columns, the task shall be assessed in both. Tasks requiring long term accomplishment shall be assessed during the continuous assessment (CA). Other tasks require short time to accomplish; therefore, they shall be assessed during the semester examination (SE). Some tasks, which are common and cover daily laboratory practice of the Assistant Health Laboratory Technologist after completion of this module, shall be assessed in both CA and SE. The assessor shall focus on those core areas of competences as stipulated in the curriculum.

2.0 ENABLING AND SUB-ENABLING OUTCOMES

The following Table shows the enabling and sub enabling outcomes of the module to be assessed

Enabling Outcomes	Sub-Enabling Outcomes
1.1 Apply Planned Preventive Maintenance for laboratory instrument and equipment according to user manual	1.1.1 Describe Maintenance of laboratory instruments to sustain service provision
	1.1.2 Apply user manuals to perform routine maintenance of laboratory equipment and instruments to sustain service provision
	1.1.3 Describe maintenance of laboratory equipment to sustain service provision
1.2 Apply knowledge and skills of instrumentation in calibrating laboratory instruments and equipment	1.2.1 Describe calibration of laboratory instruments to sustain service provision
	1.2.2 Describe calibration of laboratory equipment to sustain service provision
	1.2.3 Apply user manuals to perform calibration of laboratory equipment and instruments to sustain service provision
1.3 Apply knowledge and skills to develop PPM and calibration logs for laboratory instruments and equipment	1.3.1 Describe maintenance and calibration logs for monitoring laboratory equipment and instruments performance
	1.3.2 Demonstrate skills on preparing maintenance and calibration logs of laboratory instruments/equipment to sustain service provision
	1.3.3 Describe documentation of equipment/instruments maintenance and calibration to monitor equipment performance

3.0 HOW TO USE THIS ASSESSMENT PLAN

Each task/competence specified in the Table below, will be assessed separately.
The tasks will be assessed during assignment, Theory and practical tests/ examinations.
Broader tasks (indicated by √ in both Columns for CA&SE) will be assessed in CA and SE based on this assessment plan.

Table below clarify how the sub-enabling outcomes and their related tasks will be assessed.

S/N	Sub-enabling Outcomes and Associated Task	Competence to be Assessed				38			
		Knowledge	Skills	Understanding	Wider	No. of tasks provided under Continuous Assessment and Semester Exams			
2.1	**Sub-enabling Outcome:**					**CA**		**SE**	
	2.1.1 Describe Maintenance of laboratory instruments to sustain service provision					**TH**	**PR**	**TH**	**PR**
	Tasks:					**19**	**19**	**14**	**11**
	a) Define Maintenance of instrument	√				√			
	b) Explain types of maintenance in laboratory practice (Planned maintenance and corrective maintenance)			√		√		√	
	c) Explain the importance of Maintenance for laboratory instruments			√		√		√	
	d) Describe Maintenance steps of laboratory instruments			√		√		√	
	Sub-enabling Outcome: 2.1.2 Apply user manuals to perform routine maintenance of laboratory equipment and instruments to sustain service provision								
	Tasks:								
	a) Perform routine maintenance of hematology analyzer according to SOP		√				√		
	b) Perform routine maintenance of chemistry analyzer according to SOPs		√				√		
	c) Perform routine maintenance of autoclave, hot air oven, water bath, hot plate, incubator according to SOPs		√				√		√
	d) Perform routine maintenance of microscope according to SOPs		√				√		√
	e) Perform routine maintenance of weighing scale according to SOPs		√				√		√

S/N	Sub-enabling Outcomes and Associated Task	Competence to be Assessed				38			
		Knowledge	Skills	Understanding	Wider	No. of tasks provided under Continuous Assessment and Semester Exams			
	f) Perform maintenance of automated and non-automated pipettes		√				√		√
	g) Perform routine maintenance of timer, thermometer according to SOPs		√				√		√
	Sub-enabling Outcome: 2.1.3 Describe maintenance of laboratory equipment to sustain service provision **Tasks**								
	a) Explain importance of maintaining laboratory equipment			√		√		√	
	b) Explain the functional checks for laboratory equipment *(start up, shut downs, run control, concentrated cleaning, waste level, reagent level, lamp, tubing's, filters, probe)*			√		√		√	
	c) Distinguish between periodic and routine maintenance of equipment			√		√		√	
2.2	**Sub-enabling Outcome:** 2.2.1 Describe calibration of laboratory instruments to sustain service provision **Tasks**								
	a) Define calibration of laboratory instruments	√				√			
	b) Explain the importance of calibration of laboratory instruments			√		√		√	
	c) Describe calibration steps for essential laboratory instruments (*i.e., Stop watch, Eppendorf pipette, tally counter, Differential counter etc.*) according to SOP			√		√		√	
	Sub-enabling Outcome: 2.2.2 Describe calibration of laboratory equipment to sustain service provision **Tasks**								
	a) Define calibration of laboratory equipment	√				√			
	b) Explain the importance of calibration of laboratory equipment			√		√		√	
	c) Describe calibration steps for automated analyzers (*using controls with hematology analyzer; using calibrators and standard*			√		√		√	

S/N	Sub-enabling Outcomes and Associated Task	Competence to be Assessed				38			
		Knowledge	Skills	Understanding	Wider	No. of tasks provided under Continuous Assessment and Semester Exams			
	solutions with chemistry analyzer and using control beads with CD4 analyzers; verify with quality control) according to SOP								
	Sub-enabling Outcome: 2.2.3 Apply user manuals to perform calibration of laboratory equipment and instruments to sustain service provision **Tasks**								
	a) Perform calibration of micropipettes according to SOPs		√				√		√
	b) Perform calibration of pH meter according to SOPs		√				√		√
	c) Perform calibration of colorimeter according to SOPs		√				√		√
	d) Perform calibration of analytic balance according to SOPs		√				√		√
	e) Perform calibration of chemistry analyzer according to SOPs		√				√		
	f) Perform calibration on the flow cytometer according to SOPs		√				√		
	g) Perform calibration on the automated hematology analyzer according to SOPs		√				√		
	h) Document calibration results		√				√		√
2.3	**Sub-enabling Outcome:** 2.3.1 Describe maintenance and calibration logs for monitoring laboratory equipment and instruments performance **Tasks**								
	a) Define terms (*calibration log and maintenance log*)	√				√			
	b) List components of calibration log (*address, title, department name, section, equipment name, calibrating personnel name and signature, serial number, date of last and next calibration, calibration factors, calibration status, Lot number, expiry date, approval name and signature*)	√				√		√	

S/N	Sub-enabling Outcomes and Associated Task	Competence to be Assessed				38			
		Knowledge	Skills	Understanding	Wider	No. of tasks provided under Continuous Assessment and Semester Exams			
	c) List components of maintenance logs (*address, title, department name, frequency {daily, weekly, monthly, as needed}, date of maintenance, performed by, maintenance tasks, approved by, signature*)	√				√		√	
8.	**Sub-enabling Outcome:** 2.3.2 Demonstrate skills on preparing maintenance and calibration logs of laboratory instruments/equipment to sustain service provision **Tasks**								
	a) Identify required materials for preparing calibration and maintenance logs used in the Laboratory		√				√		
	b) Develop maintenance logs as per user manual		√				√		√
	c) Develop calibration logs as per user manual		√				√		√
	d) Use maintenance and calibration logs to monitor equipment performance		√				√		
	Sub-enabling Outcome: 2.3.3 Describe documentation of equipment/instruments maintenance and calibration to monitor equipment performance **Tasks**								
	a) Define documentation	√				√			
	b) Explain importance of documenting maintenance for laboratory equipment/instruments			√		√		√	
	c) Explain importance of documenting calibration for laboratory equipment/instruments			√		√		√	

4.0 ASSESSSMENT INSTRUCTIONS

This section describes number of examinations in a module for both Continuous Assessment (CA) and Semester Examination (SE), duration, number of questions, marks allocation and sections for each component of assessment.
It consists of two parts of the assessment; Continuous Assessment and Semester Examination. Continuous assessment shall be conducted throughout the semester and contribute 40% of the module weight and Semester Examination shall be conducted at the end of semester and contribute 60% of the module weight.

4.1 Continuous Assessment

4.1.1 Module weight

The continuous assessment shall contribute 40% of the total module weight. There shall be two (2) components of continuous assessments;

a) Written tests shall contribute 35% of the total weight
b) Assignments shall contribute 5% of the total weight

4.1.2 Duration of assessments

The duration of each written test shall be two and half (2½) hours

4.1.3 Number of questions, marks distributions and sections

a) Written tests

There shall be minimum of two written examinations. The continuous written assessment examination shall have five sections; A, B, C, D and E

i. Section A shall comprise of twenty (20) Multiple Choice Questions each having 5 options with a total of 20 marks (1 mark for each question)
ii. Section B shall comprise of four (4) Multiple True/False Questions each having 5 statements with a total of 10 marks ($^1/_2$ mark for each statement)
iii. Section C shall comprise of two (2) Matching Item Questions each with 5 premises and 8 responses with a total of 10 marks (5 marks for each question)
iv. Section D shall comprise of six (6) Short Answer Questions with a total of 30 marks (score for each question shall be 5 marks)
v. Section E shall comprise of two (2) Guided Essay Questions with a total of 30 marks (15 marks for each question)

In all sections candidates shall be required to answer **ALL** questions

b) Practical tests

There shall be two (2) practical examination papers.

i. The practical examination shall have four (4) questions each carries twenty five (25) marks
ii. The examination questions will be set from the tasks which address skills or wider attribute present in the CA.
iii. The examination will be conducted for three (3) hours.

Candidates shall be required to answer **ALL** questions.

c) Assignments

i. There shall be two individual written assignments
ii. The assignment format will depend on the nature of competency to be assessed.
iii. Note: Objective questions are NOT ALLOWED to be assessed in the assignment.

4.2 Semester Examination

4.2.1 Module weight

The semester examination shall contribute 60% of the total module weight. There shall be two (2) components of semester examination;

a) Written examination shall contribute 20% of the total weight
b) Practical examination shall contribute 40% of the total weight

4.2.2 Duration of assessments

The duration of written examination shall be two and half (2½) hours

4.2.3 Number of questions, marks distributions and sections

a) Written examination

The semester examination shall have five sections: A, B, C, D and E:

i. Section A shall comprise of twenty (20) Multiple Choice Questions each having 5 options with a total of 20 marks (1 mark for each question)
ii. Section B shall comprise of four (4) Multiple True/False Questions each having 5 statements with a total of 10 marks (0.5 marks for each statement)
iii. Section C shall comprise of two (2) Matching Item Questions each with 5 premises and 8 responses with a total of 10 marks (5 marks for each question)
iv. Section D shall comprise of six (6) Short Answer Questions with a total of 30 marks (score for each question shall be 5 marks)
v. Section E shall comprise of two (2) Guided Essay Questions with a total of 30 marks (15 marks for each question)

In all sections candidates shall be required to answer **ALL** questions.

b) Practical examination

i. The practical examination shall have four (4) questions each carries twenty five (25) marks
ii. The examination questions will be set from the tasks which address skills or wider attribute present in the SE.
iii. The examination will be conducted for three (3) hours.

Candidates shall be required to answer **ALL** questions.

Module Code : MLT05103

Name of the Module: Principles of Entrepreneurship
QUALIFICATION: NTA Level 5 - Technician Certificate in Medical Laboratory Sciences.

1.0 INTRODUCTION:

This Assessment Plan has been prepared by the Ministry of Health (MoH) in collaboration with the National Council for Technical and Vocational Education and Training (NACTVET) for the module MLT05103 Principles of Entrepreneurship

The Assessment Plan is one of the tools for implementing competence-based education and training (CBET) curricula. The assessor therefore, shall assess learning outcomes stipulated within the NTA level 5 curriculum flexibly based on the student's ability to show competence involving application of knowledge and skills in a broad range of work activities most of which are routine.

This Assessment Plan was developed in October 2022 from an NTA level 5 curriculum which was approved in May 2022. It has two components of the module to be assessed. These components are Continuous Assessment (CA) which will carry 40% of the module weight; and Semester Examination (SE) which will carry the remaining 60% of the module weight.

This Assessment Plan contains sub-enabling outcomes with related tasks that shall be tested in Continuous Assessment (CA) and Semester Examination (SE). A tick (√) which appears in either CA or SE column indicates the period when the task shall be assessed. Where a tick (√) appears in both CA and SE columns, the task shall be assessed in both. Tasks requiring long term accomplishment shall be assessed during the continuous assessment (CA). Other tasks require short time to accomplish; therefore, they shall be assessed during the semester examination (SE). Some tasks, which are common and cover daily Laboratory practice of the Assistant Health Laboratory Technologist after completion of this module, shall be assessed in both CA and SE. The assessor shall focus on those core areas of competences as stipulated in the curriculum.

2.0 ENABLING AND SUB-ENABLING OUTCOMES

The following Table shows the enabling and sub enabling outcomes of the module to be assessed

Enabling Outcomes	Sub-Enabling Outcomes
4.1 Describe the nature and scope of entrepreneurship to establish and operate health business	4.1.1 Describe concept and scope of entrepreneurship in business
	4.1.2 Describe evolution of Entrepreneurship in Tanzania
	4.1.3 Describe significance of entrepreneurship in socio-economic development
4.2 Apply entrepreneurial knowledge and skills to develop health business	4.2.1 Describe business opportunities in health care industry
	4.2.2 Describe requirements for establishing business
	4.2.3 Apply entrepreneurial skills in developing a business plan for a selected business
	4.2.4 Describe business financing in health care industry
	4.2.5 Describe management of health-related projects
4.3 Apply entrepreneurial principles and ethics in operating and managing health business	4.3.1 Determine profitability of the business
	4.3.2 Describe marketing skills required for successful business performance
	4.3.3 Apply skills of business record keeping techniques in health industry
	4.3.4 Describe ethical principles in operating health business
	4.3.5 Demonstrate ethics in operating health business
	4.3.6 Demonstrate professionalism in providing business
	4.3.7 Describe social responsibility in business operations
4.4 Apply knowledge of entrepreneur to comply with legal aspects governing provision of health business	4.4.1 Describe legal regulations governing the provision of health business
	4.4.2 Describe policy guidelines governing provision of health business
	4.4.3 Describe methods of monitoring compliance in provision of health services

3.0 HOW TO USE THIS ASSESSMENT PLAN

Each task/competence specified in the Table below, will be assessed separately. The tasks will be assessed during assignment, Theory and practical tests/ examinations. Broader tasks (indicated by √ in both Columns for CA&SE) will be assessed in CA and SE based on this assessment plan.

S/ N	Sub-enabling Outcomes and Associated Task	Competence to be Assessed				78	
		Knowledge	Skills	Understanding	Wider	No. of tasks provided under Continuous Assessment and Semester Exams	
4.4	**Sub-enabling Outcome**: **4.4.4** Describe the concept and scope of entrepreneurship in business **Tasks**:					**CA** **78**	**SE** **73**
	a) Define key terms; Entrepreneurship, Entrepreneur, intrapreneurship, intrapreneur, risk, innovation and creativity	√				√	
	b) Explain theories of entrepreneurship (*Economic, Sociological and Psychological*)			√		√	√
	c) Explain notable characteristics of an entrepreneur (*innovation & creativity, risk taking, achievement oriented, hardworking, perseverance, problem solving, opportunistic* etc)			√		√	√
	d) Describe entrepreneurial competencies/skills required by entrepreneurs (*planning, book keeping, networking, communication, conflict resolution, formation of enterprise, ICT skills etc.*)			√		√	√
	e) Describe socio-cultural factors affecting entrepreneurial behavior			√		√	√
2.	**Sub-enabling Outcome**: **4.4.5** Describe evolution of Entrepreneurship in Tanzania **Tasks**:						
	a) Describe entrepreneurship development during pre-colonial era			√		√	√
	b) Describe entrepreneurship development during independence			√		√	√
	c) Describe entrepreneurship development during post-independence			√		√	√
	d) Describe entrepreneurship development during economic liberalization era			√		√	√

S/N	Sub-enabling Outcomes and Associated Task	Competence to be Assessed				78	
		Knowledge	Skills	Understanding	Wider	No. of tasks provided under Continuous Assessment and Semester Exams	
	e) Explain challenges facing entrepreneurship development in the existing business environment			√		√	√
3.	**Sub-enabling Outcome**: **4.4.6** Describe significance of entrepreneurship in socio-economic development **Tasks:**						
	a) Explain risks associated with entrepreneurship			√		√	√
	b) Explain risk management techniques			√		√	√
	c) Describe role of entrepreneurship in effecting socio-economic development (*poverty alleviation, economic growth, employment creation, technological advancement, improving living standard of people* etc.)			√		√	√
4.	**Sub-enabling Outcome**: 4.2.1 Describe business opportunities in health care industry **Tasks:**						
	a) Describe business idea generation process			√		√	√
	b) Identify sources of business idea			√		√	√
	c) List possible health business opportunities (Laboratory services, Laboratory supplies and health facilities, pharmacy, chemists etc.)	√				√	√
	d) Explain selection criteria for health business opportunities			√		√	√
	e) Select appropriate health business opportunity according to the selection criteria	√				√	√
5.	**Sub-enabling Outcome**: **4.2.2** Describe requirements for establishing business **Tasks:**						
	a) List the requirements for establishing health business (capital, premises, human resources, legal documents, market and technology)	√				√	√
	b) Explain the importance of each requirement for establishing health business			√		√	√
	c) Explain processes of establishing health business in Tanzania			√		√	√

S/N	Sub-enabling Outcomes and Associated Task	Competence to be Assessed				78	
		Knowledge	Skills	Understanding	Wider	No. of tasks provided under Continuous Assessment and Semester Exams	
	d) Describe health Laboratory services as a business enterprise			√		√	√
6.	**Sub-enabling Outcome**: 4.2.3 Apply entrepreneurial skills in developing a business plan for a selected business **Tasks:**						
	a) Explain the meaning and importance of business plan			√		√	√
	b) Describe components of business plan (*executive summary, business concept, financial features, financial requirements, current business position, major achievements, introduction and business description* (who you are, what you plan to sell or offer, why and to whom), marketing plan (*project market share, positioning of business, pricing, distribution, promotion plans, sales potential, identify and analyse competitors), management team and personnel (your credentials and the people you plan to recruit to work with you*), production and operations plan (premises, production facilities and management, information system and IT), financial forecast (cash flow statement, income statement and a balance sheet), risk assessment, appendices			√		√	√
	c) Identify kind of business to be established			√		√	
	d) Conduct business environmental analysis using (SWOT/SWOC and PESTEL analysis)		√			√	
	e) Identify business scale and associated requirements			√		√	√
	f) Complete statutory requirements for establishing a business				√	√	
	g) Determine quality and quantity of resources required for establishing a business			√		√	

S/N	Sub-enabling Outcomes and Associated Task	Competence to be Assessed				78	
		Knowledge	Skills	Understanding	Wider	No. of tasks provided under Continuous Assessment and Semester Exams	
	h) Prepare business plan		√			√	
7.	**Sub-enabling Outcome**: **4.2.4** Describe business financing in health care industry **Tasks:**						
	a) Explain equity and debt sources of business finance			√		√	√
	b) Explain various sources of equity finance			√		√	√
	c) Explain various sources of debt finance			√		√	√
	d) Explain requirements for debt finance			√		√	√
	e) Explain challenges confronting entrepreneurs in accessing finance			√		√	√
	f) Suggest solutions for challenges confronting entrepreneurs in accessing finance			√		√	√
8.	**Sub-enabling Outcome**: **4.2.5** Describe management of health-related projects **Tasks:**						
	a) Explain common terms used in project management			√		√	√
	b) Identify types of projects			√		√	√
	c) Explain project preparation design and planning (*inputs, outputs, outcomes and impacts*)			√		√	√
	d) Explain project implementation and monitoring			√		√	√
	e) Explain project review and evaluation			√		√	√
	f) Explain impact assessment			√		√	√
9.	**Sub-enabling Outcome**: 4.3.1 Determine profitability of the business **Tasks:**						

S/N	Sub-enabling Outcomes and Associated Task	Competence to be Assessed				78	
		Knowledge	Skills	Understanding	Wider	No. of tasks provided under Continuous Assessment and Semester Exams	
	a) Define profit, loss, fixed cost, variable cost	√				√	
	b) Calculate gross profit from business		√			√	√
	c) Calculate expenses (*variable + fixed*)		√			√	√
	d) Compute Net income from business (*Gross profit – expenses*)		√			√	√
	e) Compute Net profit (loss) before taxes		√			√	√
	f) Keep records and analyse the profit trend		√			√	
10.	**Sub-enabling Outcome**: 4.3.2 Describe marketing skills required for successful business performance **Tasks:**						
	a) Explain meaning of marketing			√		√	√
	b) Explain marketing mix elements (*4Ps – product, price, place/distribution, promotion for goods and 7Ps - product, price, place/distribution, promotion, people, physical evidence and process for service industry*)			√		√	√
	c) Explain the relevance of each marketing mix elements in executing health businesses			√		√	√
	d) Describe marketing skills required in health businesses (*marketing research, networking, branding, customer satisfaction, customer care and market segmentation*)			√		√	√

11.	**Sub-enabling Outcome**: 4.3.3 Apply skills of business record keeping techniques in health industry **Tasks:**						
	a) List types of business records (*sales, purchases, debtors, fees and licenses and business trends*)	√				√	√
	b) Describe techniques of record keeping (*electronic and non-electronic*)			√		√	√
	c) Prepare sales and purchases registers		√			√	
	d) Prepare double entry book keeping		√			√	√
	e) Use records to determine business performance		√			√	√
12.	**Sub-enabling Outcome**: 4.3.4 Describe ethical principles in operating health business **Tasks:**						
	a) Define the term business ethics	√				√	
	b) Explain health ethics in operating health business			√		√	√
	c) List ethical codes in operating health business (*ref code of ethics and professional conduct for health business in Tanzania*)	√				√	√
	d) List limitations in observing health ethics	√				√	√
13.	**Sub-enabling Outcome**: 4.3.5 Demonstrate ethics in operating health business **Tasks:**						
	a) Identify ethical behavior in health business			√		√	√
	b) Determine ethical and unethical behavior in operating health business			√		√	√
	c) Explain effects of both behavior			√		√	√
14.	**Sub-enabling Outcome**: 4.3.6 Demonstrate professionalism in providing business **Tasks:**						
	a) Identify attributes of Laboratory professionalism of health business			√		√	√
	b) Demonstrate professional and unprofessional behavior in operating health business			√		√	√
	c) Outline professional and unprofessional behavior (*honest, respect, meetings, communication, time*	√				√	√

	management, integrity, safety, corporate goals, dress, accountability, team work and commitment)						
	d) Explain effects of professional and unprofessional behavior			√		√	√
15.	**Sub-enabling Outcome**: 4.3.7 Describe social responsibility in business operations **Tasks:**						
	a) Explain the concept of social responsibility/corporate social responsibility (CSR) of business (*profit, people and planet*)			√		√	√
	b) Describe argument for and against CSR			√		√	√
	c) Describe environmentalism as a special component of CSR			√		√	√
16.	**Sub-enabling Outcome**: 4.4.1 Describe legal regulations governing the provision of health business **Tasks:**						
	a) List legislature Act governing health business *(TRA, TMDA, BRELA, OSHA, NEMC, PHLB)*	√				√	√
	b) List regulatory authorities governing health business *(TRA, TMDA, BRELA, OSHA, NEMC, PHLB, HLPC)*	√				√	√
	c) Explain responsibility and composition of each regulatory authority			√		√	√
	d) Outline how each regulatory authority work to govern health services provision	√				√	√
	e) Identify actions that breach regulations and policy guidelines			√		√	√
17.	**Sub-enabling Outcome**: 4.4.2 Describe policy guidelines governing provision of health business **Tasks:**						
	a) Define policy and policy guide line	√				√	
	b) List policy guidelines governing provision of health services *(National health Laboratory guidelines, Blood transfusion guide lines and Health care technical services)*	√				√	√
	c) Explain policy guidelines governing provision of health services (*National health Laboratory guidelines, Blood transfusion guide lines and Health care technical services*)			√		√	√

18	**Sub-enabling Outcome**: 4.4.3 Describe methods of monitoring compliance in provision of health services **Tasks:**						
	a) List methods of monitoring compliance with guidelines (inspection, supervision and interview)	√				√	√
	b) List advantage and disadvantage of each method of monitoring compliance with guidelines	√				√	√
	c) Identify sections in regulation and policy guidelines governing provision of Laboratory services			√		√	√
	d) Interpret regulation and policy guidelines			√		√	√
	e) Identify actions that bleach regulation and policy guidelines			√		√	√

4.0 ASSESSSMENT INSTRUCTIONS

This section describes number of examinations in a module for both Continuous Assessment (CA) and Semester Examination (SE), duration, number of questions, marks allocation and sections for each component of assessment.

It consists of two parts of the assessment; Continuous Assessment and Semester Examination. Continuous assessment shall be conducted throughout the semester and contribute 40% of the module weight and Semester Examination shall be conducted at the end of semester and contribute 60% of the module weight.

4.1 Continuous Assessment

4.1.1 Module weight

The continuous assessment shall contribute 40% of the total module weight. There shall be two (2) components of continuous assessments;

a) Written tests shall contribute 25% of the total weight
b) Assignments shall contribute 5% of the total weight
c) Business plan presentation shall contribute 10% of the total weight

4.1.2 Duration of assessments

The duration of each written test shall be two and half (2½) hours

4.1.3 Number of questions, marks distributions and sections

a) Written tests

There shall be minimum of two written examinations. The continuous written assessment examination shall have five sections; A, B, C, D and E

i. Section A shall comprise of twenty (20) Multiple Choice Questions each having 5 options with a total of 20 marks (1 mark for each question)
ii. Section B shall comprise of four (4) Multiple True/False Questions each having 5 statements with a total of 10 marks ($^1/_2$ mark for each statement)
iii. Section C shall comprise of two (2) Matching Item Questions each with 5 premises and 8 responses with a total of 10 marks (5 marks for each question)
iv. Section D shall comprise of six (6) Short Answer Questions with a total of 30 marks (score for each question shall be 5 marks)
v. Section E shall comprise of two (2) Guided Essay Questions with a total of 30 marks (15 marks for each question)

In all sections candidates shall be required to answer **ALL** questions

b) Assignments

i. There shall be two individual written assignments
ii. The assignment format will depend on the nature of competency to be assessed.
iii. Note: Objective questions are NOT ALLOWED to be assessed in the assignment.

c) Business Plan presentation

i. There shall be a Business Plan presentation
ii. A candidate shall prepare his/her own Business Plan and submit it to his/her subject coordinator three (3) weeks before the commencement of End of Semester Examinations
iii. The presentation shall be in PowerPoint, based on the submitted Business Plan

4.2 Semester Examination

4.2.1 Module weight

The semester examination shall contribute 60% of the total module weight. There shall be two (2) components of semester examination;

a) Written examination shall contribute 50% of the total weight
b) Business plan shall contribute 10% of the total weight

4.2.2 Duration of assessments

The duration of written examination shall be two and half (2½) hours

4.2.3 Number of questions, marks distributions and sections

a) Written examination

The semester examination shall have five sections: A, B, C, D and E:

i. Section A shall comprise of twenty (20) Multiple Choice Questions each having 5 options with a total of 20 marks (1 mark for each question)
ii. Section B shall comprise of four (4) Multiple True/False Questions each having 5 statements with a total of 10 marks (0.5 marks for each statement)
iii. Section C shall comprise of two (2) Matching Item Questions each with 5 premises and 8 responses with a total of 10 marks (5 marks for each question)
iv. Section D shall comprise of six (6) Short Answer Questions with a total of 30 marks (score for each question shall be 5 marks)
v. Section E shall comprise of two (2) Guided Essay Questions with a total of 30 marks (15 marks for each question)

In all sections candidates shall be required to answer **ALL** questions.

b) Business plan

i. Business plan shall be submitted three (3) weeks before the commencement of End of Semester Examinations
ii. Submitted document shall have marked in the presence of the external examiner using Checklist for assessing Business Plan

Module Code : MLT05104

Name of the Module: Laboratory Quality Assurance
QUALIFICATION: NTA Level 5 - Technician Certificate in Medical Laboratory Sciences.

1.0 INTRODUCTION:

This Assessment Plan has been prepared by the Ministry of Health (MoH) in collaboration with the National Council for Technical and Vocational Education and Training (NACTVET) for the module MLT05104 Laboratory Quality Assurance

The Assessment Plan is one of the tools for implementing competence-based education and training (CBET) curricula. The assessor therefore, shall assess learning outcomes stipulated within the NTA level 5 curriculum flexibly based on the student's ability to show competence involving application of knowledge and skills in a broad range of work activities most of which are routine.

This Assessment Plan was developed in October 2022 from an NTA level 5 curriculum which was approved in May 2022. It has two components of the module to be assessed. These components are Continuous Assessment (CA) which will carry 40% of the module weight; and Semester Examination (SE) which will carry the remaining 60% of the module weight.

This Assessment Plan contains sub-enabling outcomes with related tasks that shall be tested in Continuous Assessment (CA) and Semester Examination (SE). A tick (√) which appears in either CA or SE column indicates the period when the task shall be assessed. Where a tick (√) appears in both CA and SE columns, the task shall be assessed in both. Tasks requiring long term accomplishment shall be assessed during the continuous assessment (CA). Other tasks require short time to accomplish; therefore, they shall be assessed during the semester examination (SE). Some tasks, which are common and cover daily Laboratory practice of the Assistant Health Laboratory Technologist after completion of this module, shall be assessed in both CA and SE. The assessor shall focus on those core areas of competences as stipulated in the curriculum.

2.0 ENABLING AND SUB-ENABLING OUTCOMES

The following Table shows the enabling and sub enabling outcomes of the module to be assessed

Enabling Outcomes	**Sub-Enabling Outcomes**
5.1 Apply concepts of quality assurance to manage Laboratory operations	5.1.1 Describe quality assurance processes for Laboratory operations
	5.1.2 Apply knowledge and skills of quality assurance to monitor Laboratory operations
	5.1.3 Apply quality assurance guidelines to prepare quality assessment reports in Laboratory operations
5.2 Apply principles of non-conformances management in Laboratory operations	5.2.1 Describe techniques of managing non-conformances in Laboratory operations
	5.2.2 Apply knowledge of non-conformance management in Laboratory operations
	5.2.3 Apply skills of managing nonconformance in Laboratory operations
5.3 Apply principles of corrective and preventive measures in Laboratory quality assurance	5.3.1 Describe corrective and preventive measures in performing Laboratory quality assurance processes
	5.3.2 Describe tools for preventive measures in Laboratory quality assurance operations
	5.3.3 Apply tools for corrective and preventive measures in Laboratory quality assurance operations

3.0 HOW TO USE THIS ASSESSMENT PLAN

Each task/competence specified in the Table below, will be assessed separately.
The tasks will be assessed during assignment, Theory and practical tests/ examinations.
Broader tasks (indicated by √ in both Columns for CA&SE) will be assessed in CA and SE based on this assessment plan.

S/N	Sub-enabling Outcomes and Associated Task	Competence to be Assessed				48		
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams		
1.	**Sub-enabling Outcome**: 5.1.1 Describe quality assurance processes for Laboratory operations **Tasks:**					**CA**		**SE**
						TH	**OR**	**TH**
						48		**33**
	a) Define the terms: (*Quality assurance, Quality assurance cycle, Quality Control, Internal quality control, External quality control, Levey-Jennings Charts and Quality assessment*)	√				√		
	b) List key components of quality assurance framework (*External quality assurance/control, Internal quality control, Standardization of processes and procedures, Management and Organization*)	√				√	√	√
	c) Explain quality assurance cycle/phases (*Pre-analytical, Analytical and Post-analytical*)			√		√	√	√
	d) Explain the importance of quality assurance			√		√	√	√
2.	**Sub-enabling Outcome:** 5.1.2 Apply knowledge and skills of quality assurance to monitor Laboratory operations **Tasks:**							
	a) List methods of monitoring quality assurance in Laboratory operation (Procedure's standardization (SOPs), Quality Control, External Quality Assurance/Proficiency testing, Process Organization and Management of records)	√				√	√	√
	b) Explain the importance of monitoring Laboratory quality assurance performance			√		√	√	√
	c) Differentiate between Internal quality control and External quality assurance/Proficiency testing			√		√		√
	d) Describe sources of poor performance in internal and			√		√	√	√

	external quality assurance processes							
	e) Develop tools for monitoring quality assurance processes in Laboratory operations (Control charts, Levey-Jennings chart, Standard operating procedures and Assessment checklists)		√			√		√
	f) Perform Internal Quality Control		√			√		√
	g) Perform External Quality Control/ Proficiency Testing		√			√		√
	h) Document quality assurance performances to monitor Laboratory processes (Quality control logs/Levey-Jennings charts)		√			√		√
	i) Keep quality assurance records for verification performances and assessments		√			√		
3.	**Sub-enabling Outcome**: 5.1.3 Apply quality assurance guidelines to prepare quality assessment reports in Laboratory operations **Tasks:**							
	a) Explain the importance of quality assessment reports			√		√	√	√
	b) Evaluate quality assurance records			√		√		
	c) Write quality assurance reports for Laboratory operations (*Preventive action reports, customer satisfaction survey report, IQC report, EQA report, TAT report, Routine review reports and rejection report*)	√				√		√
	d) Develop action plan on areas of improvement		√			√		√
	e) Define SOP	√				√		
	f) Explain the importance of SOP			√		√	√	√
	g) Develop SOP for different Laboratory operations		√			√		
4.	**Sub-enabling Outcome**: 5.2.1 Describe techniques of managing non-conformances in Laboratory operations **Tasks:**							
	a) Define term non-conformances	√				√		
	b) Distinguish between major and minor non-conformance in Laboratory operations			√		√		√
	c) Explain the importance of non-conformances management in Laboratory operations			√		√	√	√
	d) Outline indicators of non-conformances in the Laboratory (C*omplaints, gaps identified in evaluation*	√				√	√	√

	and audits reports, ICQ failure, EQA failure, daily work, Accidents and Instrument problems)							
	e) Describe techniques of detecting non-conformances in Laboratory operations (*Document review reports, EQA, IQC, Internal quality assessment and External quality assessment*)			√		√	√	√
5.	**Sub-enabling Outcome**: 5.2.2 Apply knowledge of non-conformances management in Laboratory operations **Tasks:**							
	a) Define non-conformances management	√				√		
	b) Describe process of non-conformances management (*Investigate, take immediate action, fill non-conformance form, take corrective action and report results/trends to relevant authority and record in non-conformance log*)			√		√	√	√
	c) Differentiate between nonconformance form and nonconformance log			√		√		√
	d) List important features of non-conformances form and nonconformance log/register book (*features of nonconformance form: person involved, description of NC, date, time, place, source, person recorded, immediate and corrective actions taken, medical significance and monitoring of effectiveness)*	√				√	√	√
	e) Features *of NC log: (NC number, description of NC, Person recorded and assigned to clear, Target completion date, Category of NC and Status of implementation*)	√				√		√
6.	**Sub-enabling Outcome**: 5.2.3 Apply skills of managing non-conformance in Laboratory operations **Tasks:**							
	a) Develop non-conformances form		√			√		
	b) Develop non-conformances log		√			√		√
	c) Document non-conformances in non-conformances form and log/register book		√			√		
	d) Archive non-conformances form and log for traceability		√			√		
	e) Prepare non-conformances management report *(Title, Acknowledgement, Executive Summary, Background, Scope and Objectives, Audit Approach, Conclusion,*		√			√		

	Recommendations and action plan)							
7.	**Sub-enabling Outcome**: 5.3.1 Describe corrective and preventive measures in performing Laboratory quality assurance processes **Tasks:**							
	a) Explain the terms: (*Remedial action, Corrective action and Preventive action*)			√		√	√	√
	b) Describe causes of failures in internal and external Laboratory quality assurance processes			√		√	√	√
	c) Describe the importance of documenting corrective and preventive measures in Laboratory quality assurance processes			√		√	√	√
	d) Explain corrective and preventive measures in improving Laboratory performances			√		√	√	√
8.	**Sub-enabling Outcome**: 5.3.2 Describe tools for preventive measures in Laboratory quality assurance operations **Tasks:**							
	a) List preventive action forms (temperature charts, daily safety form, IQC logs, Equipment maintenance logs, EQA review form)	√				√	√	√
	b) Explain preventive action form			√		√	√	√
	c) List key features of preventive action forms	√				√	√	√
	d) Explain the importance of using preventive forms			√		√	√	√
9.	**Sub-enabling Outcome**: 5.3.3 Apply tools for corrective and preventive measures in Laboratory quality assurance operations **Tasks:**							
	a) Develop corrective and preventive action forms		√			√		√
	b) Perform root cause analysis to determine failure in quality assurance performances (*fish bone/cause & effect, brain storming, Pareto chart and5Why*)		√			√		
	c) Fill corrective and preventive forms for failures in quality assurance performances		√			√		
	d) Write corrective action report addressing the causes and measures of quality assurance failure	√				√		
	e) Communicate the findings of the problem to other staff or relevant authority for continual improvement				√	√		

4.0 ASSESSSMENT INSTRUCTIONS

This section describes number of examinations in a module for both Continuous Assessment (CA) and Semester Examination (SE), duration, number of questions, marks allocation and sections for each component of assessment.

It consists of two parts of the assessment; Continuous Assessment and Semester Examination. Continuous assessment shall be conducted throughout the semester and contribute 40% of the module weight and Semester Examination shall be conducted at the end of semester and contribute 60% of the module weight.

4.1 Continuous Assessment

4.1.1 Module weight

The continuous assessment shall contribute 40% of the total module weight. There shall be three (3) components of continuous assessments;

a) Written tests shall contribute 25% of the total weight
b) Assignments shall contribute 5% of the total weight
c) Oral examination shall contribute 10% of the total weight

4.1.2 Duration of assessments

The duration of each written test shall be two and half (2½) hours

4.1.3 Number of questions, marks distributions and sections

a) Written tests

There shall be minimum of two written examinations. The continuous written assessment examination shall have five sections; A, B, C, D and E

i. Section A shall comprise of twenty (20) Multiple Choice Questions each having 5 options with a total of 20 marks (1 mark for each question)
ii. Section B shall comprise of four (4) Multiple True/False Questions each having 5 statements with a total of 10 marks ($^1/_2$ mark for each statement)
iii. Section C shall comprise of two (2) Matching Item Questions each with 5 premises and 8 responses with a total of 10 marks (5 marks for each question)
iv. Section D shall comprise of six (6) Short Answer Questions with a total of 30 marks (score for each question shall be 5 marks)
v. Section E shall comprise of two (2) Guided Essay Questions with a total of 30 marks (15 marks for each question)

In all sections candidates shall be required to answer **ALL** questions

b) Assignments

iv. There shall be two individual written assignments
v. The assignment format will depend on the nature of competency to be assessed.
vi. Note: Objective questions are NOT ALLOWED to be assessed in the assignment.

c) Oral Examination

i. There shall be one (1) oral examination
ii. Questions will be set by an institution from the tasks with understanding components in the specific module
iii. Institution shall prepare three (3) questions and candidates allowed to answer one after another loudly for fifteen (15) minutes
iv. Oral questions shall be set together with their correct responses and shall be rated with the following rating score 0, 1,2,3 and 4
v. Oral questions shall be scenario based, capturing problem-solving skills
vi. The scores awarded by examiners shall not vary by more than one grade from the rating scale. If the variation exceeds one grade, and a consensus cannot be reached between examiners; the Head of Department shall make a final judgement
vii. The candidate will have a choice to start with any question he/she likes.
viii. Total scores will be calculated to make up 100% which will be converted to 10%

4.2 Semester Examination

4.2.1 Module weight

The semester examination shall contribute 60% of the total module weight.

4.2.2 Duration of assessments

The duration of written examination shall be two and half (2½) hours

4.2.3 Number of questions, marks distributions and sections

Written examination

The semester examination shall have five sections: A, B, C, D and E:

i. Section A shall comprise of twenty (20) Multiple Choice Questions each having 5 options with a total of 20 marks (1 mark for each question)
ii. Section B shall comprise of four (4) Multiple True/False Questions each having 5 statements with a total of 10 marks (0.5 marks for each statement)
iii. Section C shall comprise of two (2) Matching Item Questions each with 5 premises and 8 responses with a total of 10 marks (5 marks for each question)
iv. Section D shall comprise of six (6) Short Answer Questions with a total of 30 marks (score for each question shall be 5 marks)
v. Section E shall comprise of two (2) Guided Essay Questions with a total of 30 marks (15 marks for each question)

In all sections candidates shall be required to answer **ALL** questions.

Module Code : MLT05105

Name of the Module: Health Records Management
QUALIFICATION: NTA Level 5 - Technician Certificate in Medical Laboratory Sciences.

1.0 INTRODUCTION:

This Assessment Plan has been prepared by the Ministry of Health (MoH) in collaboration with the National Council for Technical and Vocational Education and Training (NACTVET) for the module MLT05105 Health Records Management

The Assessment Plan is one of the tools for implementing competence-based education and training (CBET) curricula. The assessor therefore, shall assess learning outcomes stipulated within the NTA level 5 curriculum flexibly based on the student's ability to show competence involving application of knowledge and skills in a broad range of work activities most of which are routine.

This Assessment Plan was developed in October 2022 from an NTA level 5 curriculum which was approved in May 2022. It has two components of the module to be assessed. These components are Continuous Assessment (CA) which will carry 40% of the module weight; and Semester Examination (SE) which will carry the remaining 60% of the module weight.

This Assessment Plan contains sub-enabling outcomes with related tasks that shall be tested in Continuous Assessment (CA) and Semester Examination (SE). A tick (√) which appears in either CA or SE column indicates the period when the task shall be assessed. Where a tick (√) appears in both CA and SE columns, the task shall be assessed in both. Tasks requiring long term accomplishment shall be assessed during the continuous assessment (CA). Other tasks require short time to accomplish; therefore, they shall be assessed during the semester examination (SE). Some tasks, which are common and cover daily Laboratory practice of the Assistant Health Laboratory Technologist after completion of this module, shall be assessed in both CA and SE. The assessor shall focus on those core areas of competences as stipulated in the curriculum.

2.0 ENABLING AND SUB-ENABLING OUTCOMES

The following Table shows the enabling and sub enabling outcomes of the module to be assessed

Enabling Outcomes	**Sub-Enabling Outcomes**
6.1 Apply policies and procedures of record management system in health settings	6.1.1 Describe concept of records management in health facilities
	6.1.2 Describe methods of information management system in health facilities
	6.1.3 Apply skills of records management in health facilities.
6.2 Apply knowledge and skills of computer application programs in Laboratory operations	6.2.1 Describe computer programs for documenting and recording health information
	6.2.2 Describe electronic health management information systems (eHMIS)
	6.2.3 Apply skills of electronic health management information system in health facilities
	6.2.4 Apply knowledge and skills of information system for data management in health facilities
6.3 Apply knowledge and skills of information system in health settings operations	6.3.1 Describe methods of data presentation used in health facilities
	6.3.2 Apply skills of data presentation in health facilities
	6.3.3 Apply skills of data communication system in health facilities

3.0 HOW TO USE THIS ASSESSMENT PLAN

Each task/competence specified in the Table below, will be assessed separately.
The tasks will be assessed during assignment, Theory and practical tests/ examinations.
Broader tasks (indicated by √ in both Columns for CA&SE) will be assessed in CA and SE based on this assessment plan.

S/N	Sub-enabling Outcomes and Associated Task	Competence to be Assessed				46		
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams		
1.	**Sub-enabling Outcome**: 6.1.1 Describe concept of records management in health facilities **Tasks:**					**CA**		**SE**
						TH	**OR**	**TH**
						46		**35**
	a) Define *(records, data, information, archives, documents and record management)*	√				√		
	b) Outline advantage of paper-based information system	√				√	√	√
	c) Differentiate between records and documents			√		√		√
	d) Differentiate between records and archives					√		√
	e) Relate between records and records management			√		√		√
	f) Explain type of record keeping			√		√	√	√
2.	**Sub-enabling Outcome**: 6.1.2 Describe methods of information management system in health facilities **TASKS:**							
	a) Define terms: *(paper-based and electronic information system)*	√				√		
	b) Explain types of records (paper based and electronic)			√		√	√	√
	c) Outline advantage of each record system	√				√	√	√
	d) Outline disadvantage of each record system	√				√	√	√

	e) List documents used for collecting health information (*Laboratory documents; temperature charts, occurrence log, maintenance log, calibration log, registers, log books, ledger books, request forms and dispatch books* *Other documents; prescription forms, HMIS documents 'MTUHA' and Health insurance forms*)	√				√	√	√
	f) List Laboratory records	√				√	√	√
	g) Explain record management policies and procedures			√		√	√	√
	h) Describe record management processes (creation, receipt, classification, use, retention storage and final disposition)			√		√	√	√
	i) Explain policies and procedures for disposal of records			√		√	√	√
	j) Describe various methods of disposing records			√		√	√	√
	k) Describe reasons for recycling records			√		√	√	√
	l) Describe procedures for recycling records			√		√	√	√
3.	**Sub-enabling Outcome**: 6.1.3 Apply skills of records management in health facilities **Tasks:**							
	a) Record client information in the register book		√			√		
	b) Record temperature in the charts according to guidelines		√			√		
	c) Fill appropriate information in the log books according to guidelines		√			√		
	d) Store record in secured and easily retrievable place		√			√		
4.	**Sub-enabling Outcome**: 6.2.1 Describe computer programs for documenting and recording health information **Tasks**							
	a) Explain computer programs			√		√	√	√
	b) List types of computer programs used in recording and managing health information *(word processing, spreadsheet and access)*	√				√	√	√
	c) Explain functions of computer programs *(word processing, spreadsheet and access)*			√		√	√	√
	d) Explain the importance of using computer programs in documentation and record management			√		√	√	√
5.	**Sub-enabling Outcome**:							

	6.2.2 Describe electronic health management information systems (eHMIS) **Tasks**:							
	a) Explain electronic health management information systems *(GoTHoMIS, Afya Care)*			√		√	√	√
	b) Explain advantages of electronic health management information system			√		√	√	√
	c) Explain disadvantages of electronic health management information system			√		√	√	√
	d) Explain advantages of electronic health management information system			√		√	√	√
6.	**Sub-enabling Outcome**: 6.2.3 Apply skills of electronic health management information system in health facilities **Tasks**							
	a) Maintain procedures of eHMIS for recording Laboratory information		√			√		
	b) Use the eHMIS for recording Laboratory information		√			√		
	c) Communicate Laboratory information to relevant authority using eHMIS				√	√		
7.	**Sub-enabling Outcome**: 6.2.4 Apply knowledge and skills of information system for data management in health facilities **Tasks:**							
	a) Explain electronic data storage			√		√	√	√
	b) Explain the use of password to limit accessibility of stored Laboratory information			√		√	√	√
	c) Use password to limit accessibility of stored Laboratory information		√			√		√
	d) Store Laboratory information in different electronic software		√			√		√
8.	**Sub-enabling Outcome**: 6.3.1 Describe methods of data presentation used in health facilities **Tasks**							
	a) Explain electronic data presentation			√		√	√	√
	b) List methods of data presentation *(Pie chart, Bar chart, Histogram, Table and line graph)*	√				√	√	√
	c) Explain methods of data presentation			√		√	√	√
9.	**Sub-enabling Outcome**:							

	6.3.2 Apply skills of data presentation in health facilities **Tasks**							
	a) Explain importance of data presentation in Laboratory operation			√		√	√	√
	b) Explain the use of data presentation in Laboratory operation			√		√	√	√
	c) Demonstrate data presentation for different Laboratory activities		√			√		
	Sub-enabling Outcome: 6.3.3 Apply skills of data communication system in health facilities **Tasks**							
	a) Describe concept of data communication			√		√	√	√
	b) Describe methods of data communication *(e.g., electronic mail, social media and Postal Mail)*			√		√	√	√
	c) Communicate Laboratory data through various methods				√	√		

4.0 ASSESSSMENT INSTRUCTIONS

This section describes number of examinations in a module for both Continuous Assessment (CA) and Semester Examination (SE), duration, number of questions, marks allocation and sections for each component of assessment.

It consists of two parts of the assessment; Continuous Assessment and Semester Examination. Continuous assessment shall be conducted throughout the semester and contribute 40% of the module weight and Semester Examination shall be conducted at the end of semester and contribute 60% of the module weight.

4.1 Continuous Assessment

4.1.1 Module weight

The continuous assessment shall contribute 40% of the total module weight. There shall be two (2) components of continuous assessments;

a) Written tests shall contribute 35% of the total weight
b) Assignments shall contribute 5% of the total weight

4.1.2 Duration of assessments

The duration of each written test shall be two and half (2½) hours

4.1.3 Number of questions, marks distributions and sections

a) Written tests

There shall be minimum of two written examinations. The continuous written assessment examination shall have five sections; A, B, C, D and E

i. Section A shall comprise of twenty (20) Multiple Choice Questions each having 5 options with a total of 20 marks (1 mark for each question)
ii. Section B shall comprise of four (4) Multiple True/False Questions each having 5 statements with a total of 10 marks ($^1/_2$ mark for each statement)
iii. Section C shall comprise of two (2) Matching Item Questions each with 5 premises and 8 responses with a total of 10 marks (5 marks for each question)
iv. Section D shall comprise of six (6) Short Answer Questions with a total of 30 marks (score for each question shall be 5 marks)
v. Section E shall comprise of two (2) Guided Essay Questions with a total of 30 marks (15 marks for each question)

In all sections candidates shall be required to answer **ALL** questions

b) Assignments

i. There shall be two individual written assignments
ii. The assignment format will depend on the nature of competency to be assessed.
iii. Note: Objective questions are NOT ALLOWED to be assessed in the assignment.

4.3 Semester Examination

4.3.1 Module weight

The semester examination shall contribute 60% of the total module weight.

4.3.2 Duration of assessments

The duration of written examination shall be two and half (2½) hours

4.3.3 Number of questions, marks distributions and sections

Written examination

The semester examination shall have five sections: A, B, C, D and E:

i. Section A shall comprise of twenty (20) Multiple Choice Questions each having 5 options with a total of 20 marks (1 mark for each question)
ii. Section B shall comprise of four (4) Multiple True/False Questions each having 5 statements with a total of 10 marks (0.5 marks for each statement)
iii. Section C shall comprise of two (2) Matching Item Questions each with 5 premises and 8 responses with a total of 10 marks (5 marks for each question)
iv. Section D shall comprise of six (6) Short Answer Questions with a total of 30 marks (score for each question shall be 5 marks)
v. Section E shall comprise of two (2) Guided Essay Questions with a total of 30 marks (15 marks for each question)

In all sections candidates shall be required to answer **ALL** questions.

Module Code : MLT05106

Name of the Module: General Pathology
QUALIFICATION: NTA Level 5 - Technician Certificate in Medical Laboratory Sciences.

1.0 INTRODUCTION:

This Assessment Plan has been prepared by the Ministry of Health (MoH) in collaboration with the National Council for Technical and Vocational Education and Training (NACTVET) for the module MLT05106 General Pathology

The Assessment Plan is one of the tools for implementing competence-based education and training (CBET) curricula. The assessor therefore, shall assess learning outcomes stipulated within the NTA level 5 curriculum flexibly based on the student's ability to show competence involving application of knowledge and skills in a broad range of work activities most of which are routine.

This Assessment Plan was developed in October 2022 from an NTA level 5 curriculum which was approved in May 2022. It has two components of the module to be assessed. These components are Continuous Assessment (CA) which will carry 40% of the module weight; and Semester Examination (SE) which will carry the remaining 60% of the module weight.

This Assessment Plan contains sub-enabling outcomes with related tasks that shall be tested in Continuous Assessment (CA) and Semester Examination (SE). A tick (√) which appears in either CA or SE column indicates the period when the task shall be assessed. Where a tick (√) appears in both CA and SE columns, the task shall be assessed in both. Tasks requiring long term accomplishment shall be assessed during the continuous assessment (CA). Other tasks require short time to accomplish; therefore, they shall be assessed during the semester examination (SE). Some tasks, which are common and cover daily Laboratory practice of the Assistant Health Laboratory Technologist after completion of this module, shall be assessed in both CA and SE. The assessor shall focus on those core areas of competences as stipulated in the curriculum.

2.0 ENABLING AND SUB-ENABLING OUTCOMES

The following Table shows the enabling and sub enabling outcomes of the module to be assessed

Enabling Outcomes	**Sub-Enabling Outcomes**
3.7 Apply knowledge of general pathology in diagnosis of diseases and conditions	3.7.1 Describe concepts of Pathology in diagnosis of diseases and conditions
	3.7.2 Describe cellular growth, injury and adaptation in diagnosis of diseases and conditions
	3.7.3 Describe process of inflammation and healing in diagnosis of diseases and conditions
	3.7.4 Describe classification and pathogenesis of neoplasia in diagnosis of diseases and conditions
	3.7.5 Describe pathogenesis of diseases caused by chemical and environmental factors

3.0 HOW TO USE THIS ASSESSMENT PLAN

Each task/competence specified in the Table below, will be assessed separately.
The tasks will be assessed during assignment, written and practical examination.
Broader tasks (indicated by √ in both Columns for CA and SE) will be assessed in CA and SE.

S/N	Sub-enabling Outcomes and Associated Task	Competence to be Assessed				28	
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester E	
1.	**Sub-enabling Outcome:** 3.7.1 Describe concepts of Pathology in diagnosis of diseases and conditions **Tasks:**					**CA** 28	**SE** 25
	a) Define the term pathology and pathogenesis	√				√	
	b) Explain stages of Pathology evolution (Religious and superstitious beliefs to rational approach; i. Antiquity to AD 1500), ii. Era of gross pathology (AD 1500 to 1800), iii. Era of technology development and cellular pathology (AD 1800 to 1950s), iv. Era of modern pathology (1960s to dawn of 21st century)			√		√	√
	c) Explain subdivisions of Pathology in diagnosis of diseases and conditions (*general and systemic)*			√		√	√
	d) Explain disease development/progression (*aetiology, pathogenesis, morphological changes, functional derangement & clinical significance)*			√		√	√
	e) Classify categories of diseases (infectious, nutritional, metabolic, neoplasm and congenital genetic)			√		√	√
2.	**Sub-enabling Outcome**: 3.7.2 Describe cellular growth, injury and adaptation in diagnosis of diseases and conditions **Tasks**						
	a) Explain the cell cycle and growth			√		√	√
	b) Explain cell injury			√		√	√
	c) Explain cellular responses to stress/stimuli			√		√	√

	d) Explain cellular adaptations to stimuli (atrophy, hypertrophy, hyperplasia and metaplasia)			√		√	√
	e) Explain morphology of cell and tissue injury			√		√	√
	f) Explain apoptosis			√		√	√
	g) Explain necrosis			√		√	√
3.	**Sub-enabling Outcome**: 3.7.3 Describe process of inflammation and healing in diagnosis of diseases and conditions. **Tasks:**						
	a) Define the term inflammation	√				√	
	b) Explain cardinal signs of inflammation (*Redness, Heat, Swelling, Pain and Loss of Function*)			√		√	√
	c) Explain types of inflammation (*acute and chronic*)			√		√	√
	d) Explain the basic phenomenon in acute and chronic inflammation			√		√	√
	e) Explain the outcomes of inflammation			√		√	√
	f) Explain the mechanisms of tissue healing and repair			√		√	√
5.	**Sub-enabling Outcome:** 3.7.4 Describe classification and pathogenesis of neoplasia in diagnosis of diseases and conditions **Tasks**:						
	a) Define terms; neoplasia and neoplasm	√				√	
	b) Describe classification of neoplasm (*benign and malignant*)			√		√	√
	c) Explain nomenclature of neoplasm			√		√	√
	d) Explain the risk factors for cancer development (*e.g., chemical, radiation, genetics, infectious agents and nutrition agents*)			√		√	√
6.	**Sub-enabling Outcome**: 3.7.5 Describe pathogenesis of diseases caused by chemical and environmental factors **Tasks**:						
	a) Explain pathogenesis of diseases caused by air pollution			√		√	√
	b) Explain pathogenesis of diseases caused by tobacco product use			√		√	√
	c) Explain pathogenesis of alcohol related diseases			√		√	√
	d) Explain pathogenesis of chemical and drug related diseases			√		√	√

	e) Explain pathogenesis of diseases due to physical agents (*trauma, temperature and radiation*)			√		√	√
	f) Explain nutritional and dietary diseases (K*washiorkor, marasmus, obesity and vitamin deficiencies*)			√		√	√

4.0 ASSESSSMENT INSTRUCTIONS

This section describes number of examinations in a module for both Continuous Assessment (CA) and Semester Examination (SE), duration, number of questions, marks allocation and sections for each component of assessment.

It consists of two parts of the assessment; Continuous Assessment and Semester Examination. Continuous assessment shall be conducted throughout the semester and contribute 40% of the module weight and Semester Examination shall be conducted at the end of semester and contribute 60% of the module weight.

4.1 Continuous Assessment

4.1.1 Module weight

The continuous assessment shall contribute 40% of the total module weight. There shall be three (3) components of continuous assessments;

a) Written tests shall contribute 25% of the total weight
b) Assignments shall contribute 5% of the total weight
c) Oral examination shall contribute 10% of the total weight

4.1.2 Duration of assessments

The duration of each written test shall be two and half (2½) hours

4.1.3 Number of questions, marks distributions and sections

a) Written tests

There shall be minimum of two written examinations. The continuous written assessment examination shall have five sections; A, B, C, D and E

i. Section A shall comprise of twenty (20) Multiple Choice Questions each having 5 options with a total of 20 marks (1 mark for each question)
ii. Section B shall comprise of four (4) Multiple True/False Questions each having 5 statements with a total of 10 marks ($^1/_2$ mark for each statement)
iii. Section C shall comprise of two (2) Matching Item Questions each with 5 premises and 8 responses with a total of 10 marks (5 marks for each question)
iv. Section D shall comprise of six (6) Short Answer Questions with a total of 30 marks (score for each question shall be 5 marks)
v. Section E shall comprise of two (2) Guided Essay Questions with a total of 30 marks (15 marks for each question)

In all sections candidates shall be required to answer **ALL** questions

b) Assignments

i. There shall be two individual written assignments
ii. The assignment format will depend on the nature of competency to be assessed.
iii. Note: Objective questions are NOT ALLOWED to be assessed in the assignment.

c) Oral Examination

ix. There shall be one (1) oral examination
x. Questions will be set by an institution from the tasks with understanding components in the specific module
xi. Institution shall prepare three (3) questions and candidates allowed to answer one after another loudly for fifteen (15) minutes
xii. Oral questions shall be set together with their correct responses and shall be rated with the following rating score 0, 1,2,3 and 4
xiii. Oral questions shall be scenario based, capturing problem-solving skills
xiv. The scores awarded by examiners shall not vary by more than one grade from the rating scale. If the variation exceeds one grade, and a consensus cannot be reached between examiners; the Head of Department shall make a final judgement
xv. The candidate will have a choice to start with any question he/she likes.
xvi. Total scores will be calculated to make up 100% which will be converted to 10%

4.2 Semester Examination

4.2.1 Module weight

The semester examination shall contribute 60% of the total module weight.

4.2.2 Duration of assessments

The duration of written examination shall be two and half (2½) hours

4.2.3 Number of questions, marks distributions and sections

Written examination

The semester examination shall have five sections: A, B, C, D and E:

i. Section A shall comprise of twenty (20) Multiple Choice Questions each having 5 options with a total of 20 marks (1 mark for each question)
ii. Section B shall comprise of four (4) Multiple True/False Questions each having 5 statements with a total of 10 marks (0.5 marks for each statement)
iii. Section C shall comprise of two (2) Matching Item Questions each with 5 premises and 8 responses with a total of 10 marks (5 marks for each question)
iv. Section D shall comprise of six (6) Short Answer Questions with a total of 30 marks (score for each question shall be 5 marks)
v. Section E shall comprise of two (2) Guided Essay Questions with a total of 30 marks (15 marks for each question)

In all sections candidates shall be required to answer **ALL** questions.

Module Code and Name: MLT05207 Hematology and Blood Transfusion

QUALIFICATION: NTA Level 5 - Technician Certificate in Medical Laboratory Sciences.

1.0. INTRODUCTION:

This Assessment Plan has been prepared by the Ministry of Health (MoH) in collaboration with the National Council for Technical and Vocational Education and Training (NACTVET) for the module MLT05207 Hematology and Blood Transfusion.

The Assessment Plan is one of the tools for implementing competence-based education and training (CBET) curricula. The assessor therefore, shall assess learning outcomes stipulated within the NTA level 5 curriculum flexibly based on the student's ability to show competence involving application of knowledge and skills in a broad range of work activities most of which are routine.

This Assessment Plan was developed in October 2022 from an NTA level 5 curriculum which was approved in May 2022. It has two components of the module to be assessed. These components are continuous assessment (CA) which will carry 40% of the module weight; and semester examination (SE) which will carry the remaining 60% of the module weight.

This Assessment Plan contains sub-enabling outcomes with related tasks that shall be tested in continuous assessment (CA) and semester examination (SE). A tick (√) which appears in either CA or SE column indicates the period when the task shall be assessed. Where a tick (√) appears in both CA and SE columns, the task shall be assessed in both. Tasks requiring long term accomplishment shall be assessed during the continuous assessment (CA). Other tasks require short time to accomplish; therefore, they shall be assessed during the semester examination (SE). Some tasks, which are common and cover daily Laboratory practice of the Assistant Health Laboratory Technologist after completion of this module, shall be assessed in both CA and SE. The assessor shall focus on those core areas of competences as stipulated in the curriculum.

2.0 ENABLING AND SUB-ENABLING OUTCOMES

The following table shows enabling and sub-enabling outcomes of the module to be assessed.

Enabling Outcomes	**Sub-Enabling Outcomes**
3.1 Apply knowledge and skills of Hematology and blood transfusion in performing Laboratory investigations	3.1.1 Describe concept of hematology in diagnosis of diseases
	3.1.2 Describe principles of hematological tests in diagnosis of diseases
	3.1.3 Apply skills of hematology in diagnosis of diseases
	3.1.4 Describe concept of Immunohematology in clinical Laboratory practices
	3.1.5 Describe principles of safe blood collection for transfusion services

	3.1.6 Apply skills of Blood Transfusion in Laboratory investigations

3.0 HOW TO USE THIS ASSESSMENT PLAN

Each task/competence specified in the Table below, will be assessed separately.
The tasks will be assessed during assignment, written and practical examination.
Broader tasks (indicated by √ in both Columns for CA and SE) will be assessed in CA and SE.

S/N	Sub-enabling Outcomes and Associated Task:	Competence to be Assessed				45			
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams			
1.	**Sub-enabling Outcome** 3.1.1 Describe concept of hematology in diagnosis of diseases **Tasks:**					**CA** 45		**SE** 38	
						TH	PR	TH	PR
	a) Define terms; Hematology, red blood cells, white blood cells, platelets, plasma, serum, hemoglobin	√				√			
	b) Describe hematopoiesis			√		√		√	
	c) Explain morphological features of normal white blood cells			√		√		√	
	d) Explain morphological features of normal and abnormal red blood cells			√		√		√	
	e) Explain types of normal hemoglobin *(HbA, HbA_2, HbF)*			√		√		√	
	f) List types of abnormal hemoglobin (*HbS, HbC, HbSC, HbD^{Punjab}, HbH, HbE, HbJ, HbK*)	√				√		√	
	g) Describe abnormal hemoglobin pigments (*Methemoglobin, sulphahemoglobin, carboxyhaemoglobin,)*			√		√		√	
	h) Explain sickle cell and iron deficiency anemia			√		√		√	
	i) Explain the complications associated with sickle cell and iron deficiency anemia			√		√		√	
2.	**Sub-enabling Outcome** 3.1.2 Describe principles of hematological tests in diagnosis of diseases **Tasks:**								
	a) Explain the principle of Sickle cell screening test (*the 2% sodium metabisulphite method and*			√		√		√	

	Hemoglobin solubility test)								
	b) Explain the principle of hematological analyzer			√		√		√	
	c) Explain the principle of flow cytometry			√		√		√	
	d) Explain principle of total white blood cell count using Turk's solution			√		√		√	
	e) Explain principle of staining thin blood film using Leishman stain			√		√		√	
3.	**Sub-enabling Outcome** 3.1.3 Apply skills of hematology in diagnosis of diseases **Tasks:**								
	a) Perform Sickle cell screening test by 2% sodium metabisulphite method according to SOPs		√				√		√
	b) Perform CD4, CD8 count by using flow cytometer in hematology according to SOPs		√				√		
	c) Perform full blood picture using Hematology analyzer according to SOP		√				√		
	d) Perform total white blood cell count using Turk's solution according to SOP		√				√		√
	e) Prepare thin blood film for identification of white blood cells according to SOP		√				√		√
	f) Stain thin blood film using Leishman/Wright stain according to SOP		√				√		√
	g) Identify quality of staining		√				√		√
4.	**Sub-enabling Outcome** 3.1.4 Describe concept of Immunohematology in clinical Laboratory practices **Tasks:**								
	a) Define the terms: Immunohematology, Compatibility, Rouleaux formation, cold chain, agglutinin, agglutination, Autoimmune hemolytic anemia, fresh frozen plasma, packed red cells, frozen plasma, platelets, cryoprecipitate Hemolytic disease of the new born Immunoglobulin, Antibody and Antigen	√				√			
	b) Explain ABO and Rhesus blood group system (*antigen and antibodies*)			√		√		√	
	c) Explain formation of ABO and Rhesus antibodies			√		√		√	
	d) Explain inheritance of ABO and Rhesus blood group system			√		√		√	
	e) Explain the principle of ABO and Rhesus blood grouping.			√		√		√	

	f) Explain the importance of ABO and Rhesus blood grouping.			√		√		√	
	g) List other blood group system of clinical significance	√				√		√	
	h) Explain compatibility testing			√		√		√	
5.	**Sub-enabling Outcome** 3.1.5 Describe principles of safe blood collection for transfusion services **Tasks:**								
	a) Define terms; blood transfusion, blood products, blood donor, blood recipient, cold chain, unbroken cold chain	√				√			
	b) Explain historical back ground of blood donation.			√		√		√	
	c) Explain types of blood donors. (*Voluntary non-remunerated donors, (unpaid), replacement/ family antilogous, and paid commercial or professional donors)*			√		√		√	
	d) Explain criteria for suitable blood donors (*Hb, pre-counselling: age, weight, history of travel, medical history, history of transfusions and last donation date*)			√		√		√	
	e) Explain anticoagulants used for collection of blood for transfusion (*ACD, CPDA, CPD*)			√		√		√	
	f) List advantages and disadvantages of each type of anticoagulants used in blood transfusion	√				√		√	
	g) List transfusion transmissible infections- TTIs screened in Tanzania as per guideline (*Hepatitis-B&C, HIV, Syphilis*,)	√				√		√	
	h) Explain the method of hemoglobin (*Hb) estimation ($CuSO_4$, Hemoglobinometry, Photometry*)	√				√		√	
	i) Describe cold chain process for blood and blood products according to SOPs			√		√		√	
	j) Explain importance of cold chain as applied in blood transfusion			√		√		√	
6.	**Sub-enabling Outcome** 3.1.6 Apply skills of Blood Transfusion in Laboratory investigations **Tasks:**								
	a) Perform Hb estimation according to SOPs (*$CuSO_4$, Hemoglobinometry, Photometry*)			√			√		√
	b) Perform ABO cell grouping according to SOPs (*tile and tube)*			√			√		√
	c) Perform ABO serum blood grouping according			√			√		√

	to SOPs (*tile and tube)*								
	d) Perform Rhesus blood grouping according to SOPs			√			√		√
	e) Perform compatibility test according to SOPs by tube method *(at room temperature)*			√			√		√
	f) Perform compatibility test according to SOPs by tube method (*at 37^{o}C incubation*)			√			√		√

4.0 ASSESSSMENT INSTRUCTIONS

This section describes number of examinations in a module for both Continuous Assessment (CA) and Semester Examination (SE), duration, number of questions, marks allocation and sections for each component of assessment.

It consists of two parts of the assessment; Continuous Assessment and Semester Examination. Continuous assessment shall be conducted throughout the semester and contribute 40% of the module weight and Semester Examination shall be conducted at the end of semester and contribute 60% of the module weight.

4.1 Continuous Assessment

4.1.1 Module weight

The continuous assessment shall contribute 40% of the total module weight. There shall be three (3) components of continuous assessments;

a) Written tests shall contribute 10% of the total weight
b) Practical tests shall contribute 25% of the total weight
c) Assignments shall contribute 5% of the total weight

4.1.2 Duration of assessments

The duration of each written test shall be two and half (2½) hours

4.1.3 Number of questions, marks distributions and sections

a) Written Tests

There shall be two (2) written tests. The continuous written assessment test shall have five (5) sections; A, B, C, D and E

i. Section A shall comprise of twenty (20) Multiple Choice Questions each having 5 options with a total of 20 marks (1 mark for each question)
ii. Section B shall comprise of four (4) Multiple True/False Questions each having 5 statements with a total of 10 marks (0.5 marks for each statement)
iii. Section C shall comprise of two (2) Matching Item Questions each with 5 premises and 8 responses with a total of 10 marks (5 marks for each question)
iv. Section D shall comprise of six (6) Short Answer Questions with a total of 30 marks (score for each question shall be 5 marks)
v. Section E shall comprise of two (2) Guided Essay Questions with a total of 30 marks (15 marks for each question)

In all sections candidates shall be required to answer **ALL** questions.

b) Practical Tests

There shall be two (2) practical examination paper.

i. The Practical questions will be set from the tasks which address skills or wider attribute present in the CA

ii. The examination will consist of four (4) hands on questions; each will carry twenty-five (25) marks.

Candidates shall be required to answer **ALL** questions.

c) Assignments

i. There shall be two individual written assignments
ii. The assignment format will depend on the nature of competency to be assessed
iii. Note: Objective questions are NOT ALLOWED to be assessed in the assignment

4.2 Semester Examination

4.2.1 Module weight

The semester examination shall contribute 60% of the total module weight. There shall be two (2) components of semester examination;

a) Written examination shall contribute 20% of the total weight
b) Practical examination shall contribute 40% of the total weight

4.2.2 Duration of assessments

The duration of written examination shall be two and half (2½) hours

4.2.3 Number of questions, marks distributions and sections

a) Written examination

The semester examination shall have five (5) sections: A, B, C, D and E:

i. Section A shall comprise of twenty (20) Multiple Choice Questions each having five (5) options with a total of 20 marks (1 mark for each question)
ii. Section B shall comprise of four (4) Multiple True/False Questions each having 5 statements with a total of 10 marks (0.5 marks for each statement)
iii. Section C shall comprise of two (2) Matching Item Questions each with 5 premises and 8 responses with a total of 10 marks (5 marks for each question)
iv. Section D shall comprise of six (6) Short Answer Questions with a total of 30 marks (score for each question shall be 5 marks)
v. Section E shall comprise of two (2) Guided Essay Questions with a total of 30 marks (15 marks for each question)

In all sections candidates shall be required to answer ALL questions.

b) Practical examination

i. The practical examination shall have four (4) questions each carries twenty five (25) marks
ii. The examination questions will be set from the tasks which address skills or wider attribute present in the SE.
iii. The examination will be conducted for three (3) hours.

Candidates shall be required to answer **ALL** questions.

Module Code and Name: MLT05208 Medical Microbiology and Immunology

QUALIFICATION: NTA Level 5 - Technician Certificate in Medical Laboratory Sciences.

1.0 INTRODUCTION:

This Assessment Plan has been prepared by the Ministry of Health (MoH) in collaboration with the National Council for Technical and Vocational Education and Training (NACTVET) for the module MLT05208 Medical Microbiology and Immunology.

The Assessment Plan is one of the tools for implementing competence-based education and training (CBET) curricula. The assessor therefore, shall assess learning outcomes stipulated within the NTA level 5 curriculum flexibly based on the student's ability to show competence involving application of knowledge and skills in a broad range of work activities most of which are routine.

This Assessment Plan was developed in October 2022 from an NTA level 5 curriculum which was approved in May 2022. It has two components of the module to be assessed. These components are continuous assessment (CA) which will carry 40% of the module weight; and semester examination (SE) which will carry the remaining 60% of the module weight.

This Assessment Plan contains sub-enabling outcomes with related tasks that shall be tested in continuous assessment (CA) and semester examination (SE). A tick (√) which appears in either CA or SE column indicates the period when the task shall be assessed. Where a tick (√) appears in both CA and SE columns, the task shall be assessed in both. Tasks requiring long term accomplishment shall be assessed during the continuous assessment (CA). Other tasks require short time to accomplish; therefore, they shall be assessed during the semester examination (SE). Some tasks, which are common and cover daily Laboratory practice of the Assistant Health Laboratory Technologist after completion of this module, shall be assessed in both CA and SE. The assessor shall focus on those core areas of competences as stipulated in the curriculum.

2.0 **ENABLING AND SUB-ENABLING OUTCOMES**

Enabling Outcomes (Ability to……..)	**Sub-Enabling Outcomes (Ability to……..)**
3.2 Apply knowledge and skills of Microbiology and immunology in performing Laboratory investigations	3.2.1 Describe concept of Microbiology in Laboratory investigations
	3.2.2 Describe bacteria of medical importance in Laboratory investigations
	3.2.3 Describe fungi of medical importance in Laboratory investigations
	3.2.4 Describe viruses of medical importance in Laboratory investigations
	3.2.5 Describe principles of microbiological techniques in diagnosis of diseases

	3.2.6 Apply skills of microbiological techniques to investigate diseases in the Laboratory
	3.2.7 Describe concepts of immunology in diagnosis of diseases

3.0 HOW TO USE THIS ASSESSMENT PLAN

Each task/competence specified in the Table below, will be assessed separately.
The tasks will be assessed during assignment, written and practical examination.
Broader tasks (indicated by √ in both Columns for CA and SE) will be assessed in CA and SE.

S/N	Sub-enabling Outcomes and Associated Task	Competence to be Assessed				51			
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams			
1.	**Sub-enabling Outcome:** 3.2.1 Describe concept of Microbiology in Laboratory investigations **Tasks:**					**CA** 51		**SE** 43	
						TH	PR	TH	PR
	a) Define terms; Microbiology, bacteriology, Mycology, virology, microorganism, pathogen, normal flora, virulence, antigenicity, prokaryote, eukaryote, macrophage	√				√			
	b) Explain Taxonomic and phylogenic classification of microorganism			√		√		√	
	c) Explain historical background of Microbiology			√		√		√	
	d) Explain the importance of microbiology as applied in medicine			√		√		√	
2.	**Sub-enabling Outcome:** 3.2.2 Describe bacteria of medical importance in Laboratory investigations **Tasks:**								
	a) Define bacteria, bacteria of medical importance	√				√			
	b) Explain structure of bacteria cell			√		√		√	
	4.3 Classify bacteria of medical importance (*according to staining characteristics, morphology, nature of cell wall and growth requirements*)			√		√		√	

	c) Explain Gram positive cocci of medical importance; Morphological reactions, mode of transmission, disease they cause, Laboratory diagnosis, prevention and control, (*Staphylococcus aureus, Streptococcus pyogenes, Staphylococcus saprophyticus, Staphylococcus epidermidis, Streptococcus pneumoniae, Streptococcus agalactiae, Viridans streptococci and Enterococcus feacalis*)			√		√		√	
	d) Explain Gram negative cocci of medical importance; Morphological reactions, mode of transmission, disease they cause, Laboratory diagnosis, prevention and control, (Neisseria *gonorrhoeae and Neisseria meningitidis*)			√		√		√	
	e) Explain gram positive bacilli; Morphological reactions, mode of transmission, disease they cause, Laboratory diagnosis, prevention and control, (*Bacillus anthracis, Clostridium tetani, Clostridium perfringens, Clostridium botulinum, Clostridium difficile, Corynebacterium diptheriae, and Listeria monocytogenes*)			√		√		√	
	f) Explain Gram negative bacilli of medical importance; Morphological reactions, mode of transmission, disease they cause, Laboratory diagnosis, prevention and control, (*Yersinia pestis, Chlamydia trachomatis, Hemophilus influenzae, Hemophilus ducreyi Escherichia coli, Proteus mirabilis, Klebsiella pneumoniae, Pseudomonas aeruginosa, Bordetella pertusis, Salmonellae typhi, Shigella dysenteriae, Brucella abortus, Vibrio cholerae, Helicobacter pylori and Rickettsia prowazekii)*			√		√		√	
	g) Explain other bacteria of medical importance; morphological features, mode of transmission, disease they cause, Laboratory diagnosis, prevention and control, (Mycobacterium *tuberculosis, Mycobacterium leprae, Treponema pallidum, Borrelia recurrentis* and *Borrelia dutoni*)			√		√		√	
3.	**Sub-enabling Outcome:** 3.2.3 Describe fungi of medical importance in Laboratory investigations **Tasks:**								

	a) Define terms; fungi, hyphae, moulds, spores, conidia, septae and chitin			√		√			
	b) Classify fungi of medical importance (according to taxonomy and morphology)			√		√		√	
	c) Classify fungi of medical importance (*according to taxonomy and morphology*)			√		√		√	
	d) Explain structure of fungi			√		√		√	
	e) Explain the medical importance of Fungi			√		√		√	
	f) Describe fungi of medical importance; morphological features, mode of transmission, disease they cause, Laboratory diagnosis, prevention and control, (*Candida albicans, Cryptococcus neoformans, Histoplasma capsulatum, Epidermophyton, Tricophyton, Microsporum and Pneumocystis carnii*)			√		√		√	
4.	**Sub-enabling Outcome:** 3.2.4 Describe viruses of medical importance in Laboratory investigations. **Tasks:**								
	a) Define terms; Virus, capsid, Envelop, virion, Capsomere and Genome	√				√			
	b) Classify viruses (*according to types of genomes and mode of replication*)			√		√		√	
	c) Explain structure of Virus			√		√		√	
	d) Explain the medical importance of Viruses			√		√		√	
	e) Describe Viruses of medical importance; Morphological reactions, mode of transmission, disease they cause, Laboratory diagnosis, prevention and control, (*HIV, Hepatitis B&C, Measles, Rubella, Rotavirus, Yellow fever virus, Polio virus, Dengue virus, Rift valley fever virus, Rabies virus, Ebola virus, Mumps virus, Marburg virus, Human papilloma virus, Corona virus and chicken pox*)			√		√		√	
5.	**Sub-enabling Outcome:** 3.2.5 Describe principles of microbiological techniques in diagnosis of diseases **Tasks:**								
	a) List techniques of detecting micro-organisms	√				√		√	

	b) Explain the wet preparation technique for detection of (bacteria, yeast and pus cells in specimens)			√		√		√	
	c) Explain the staining technique for detection of micro-organisms (*bacteria and fungi*)			√		√		√	
	d) Explain the principle of detection of fungal elements in skin scraping, hair and nails with the 10% KOH method			√		√		√	
	e) Explain the principle of hanging drop for the detection of *Vibrio cholerae*			√		√		√	
	f) Explain the principle of detection of leprosy/AFB in skin smears with the Ziehl Neelsen (ZN) and Auramine methods			√		√		√	
	g) Explain the principle of simple staining techniques (*Wayson's and Methylene blue*)			√		√		√	
	h) Explain principle of negative staining techniques for detection of microorganism (*Indian ink and Nigrosine*)			√		√		√	
6.	**Sub-enabling Outcome:** 3.2.6 Apply skills of microbiological techniques to investigate diseases in the Laboratory **Tasks:**								
	a) Prepare skin snip for ZN cold technique according to SOP		√				√		√
	b) Collect skin scraping, hair and nails for detection of fungal element				√		√		
	c) Perform hot ZN staining technique according to SOP		√				√		√
	d) Perform cold ZN staining technique according to SOP		√				√		√
	e) Perform Auramine staining technique according to SOP		√				√		
	f) Perform 10% KOH technique for detection of fungal elements		√				√		√
	g) Perform hanging drop technique for detection of *Vibrio cholerae*		√				√		√
	h) Perform Gram Stain technique for differentiation of micro-organisms		√				√		√
	i) Perform wet preparation technique for detection of bacteria, yeast and pus cells in specimens		√				√		√
	j) Perform simple staining techniques (*Methylene blue stain*) according to SOP		√				√		√

	k) Perform negative staining technique (*India Ink, Nigrosine)* according to SOP		√				√		√
	l) Perform Cryptococcal antibody test in serum with the latex method according to SOP		√				√		√
	m) Perform *Helicobacter pylori* antibody/antigen tests according to SOP		√				√		√
7.	**Sub-enabling Outcome:** 3.2.7 Describe concepts of immunology in diagnosis of diseases **Tasks:**								
	a) Define terms; Immunology, Serology, Antigen, Antibody, Immunoglobulins, Agglutination, Coagulation, Precipitation, Flocculation, Immunogen and hapten)	√				√			
	b) Explain features of each immunoglobulin (*IgM, IgG, IgA, IgE and IgD*)			√		√			
	c) Explain immune system in the body (*innate and Adaptive immunity*)			√		√		√	
	d) Explain types of immunological reactions (*agglutination, precipitation, flocculation and immune-chromatographic test (ICT)*)			√		√		√	
	e) Explain common diseases and conditions diagnosed through serological tests (*HIV/AIDS Syphilis Hepatitis, Pregnancy, Typhoid, Peptic ulcer due to H. pylori, brucellosis and cryptococcosis*)			√		√		√	
	f) Explain the following serological terms in relation to reporting of results: reactive, positive, non-reactive, negative, in-determinants, invalid and discordant			√		√		√	
	g) Explain the principles of serological tests			√		√		√	

4.0 ASSESSSMENT INSTRUCTIONS

This section describes number of examinations in a module for both Continuous Assessment (CA) and Semester Examination (SE), duration, number of questions, marks allocation and sections for each component of assessment.

It consists of two parts of the assessment; Continuous Assessment and Semester Examination. Continuous assessment shall be conducted throughout the semester and contribute 40% of the module weight and Semester Examination shall be conducted at the end of semester and contribute 60% of the module weight.

4.1 Continuous Assessment

4.1.1 Module weight

The continuous assessment shall contribute 40% of the total module weight. There shall be three (3) components of continuous assessments;

a) Written tests shall contribute 10% of the total weight
b) Practical tests shall contribute 25% of the total weight
c) Assignments shall contribute 5% of the total weight

4.1.2 Duration of assessments

The duration of each written test shall be two and half (2½) hours

4.1.3 Number of questions, marks distributions and sections

a) Written tests

There shall be two written tests. The continuous written assessment test shall have five (5) sections; A, B, C, D and E

i. Section A shall comprise of twenty (20) Multiple Choice Questions each having five (5) options with a total of 20 marks (1 mark for each question)
ii. Section B shall comprise of four (4) Multiple True/False Questions each having 5 statements with a total of 10 marks (0.5 marks for each statement)
iii. Section C shall comprise of two (2) Matching Item Questions each with 5 premises and 8 responses with a total of 10 marks (5 marks for each question)
iv. Section D shall comprise of six (6) Short Answer Questions with a total of 30 marks (score for each question shall be 5 marks)
v. Section E shall comprise of two (2) Guided Essay Questions with a total of 30 marks (15 marks for each question)

In all sections candidates shall be required to answer **ALL** questions.

b) Practical tests

There shall be two practical examination paper.

i. The Practical questions will be set from the tasks which address skills or wider attribute present in the CA
ii. The examination will consist of four (4) hands on questions; each will carry twenty five (25) marks.

Candidates shall be required to answer **ALL** questions.

c) Assignments

i. There shall be two individual written assignments
ii. The assignment format will depend on the nature of competency to be assessed.
iii. Note: Objective questions are NOT ALLOWED to be assessed in the assignment.

4.2 Semester Examination

4.2.1 Module weight

The semester examination shall contribute 60% of the total module weight. There shall be two (2) components of semester examination;

a) Written examination shall contribute 20% of the total weight
b) Practical examination shall contribute 40% of the total weight

4.2.2 Duration of assessments

The duration of written examination shall be two and half (2½) hours

4.2.3 Number of questions, marks distributions and sections

a) Written examination

The semester examination shall have five (5) sections: A, B, C, D and E:

i. Section A shall comprise of twenty (20) Multiple Choice Questions each having five (5) options with a total of 20 marks (1 mark for each question)
ii. Section B shall comprise of four (4) Multiple True/False Questions each having 5 statements with a total of 10 marks (0.5 marks for each statement)
iii. Section C shall comprise of two (2) Matching Item Questions each with 5 premises and 8 responses with a total of 10 marks (5 marks for each question)
iv. Section D shall comprise of six (6) Short Answer Questions with a total of 30 marks (score for each question shall be 5 marks)
v. Section E shall comprise of two (2) Guided Essay Questions with a total of 30 marks (15 marks for each question)

In all sections candidates shall be required to answer ALL questions.

b) Practical examination

i. The practical examination shall have four (4) questions each carries twenty five (25) marks
ii. The examination questions will be set from the tasks which address skills or wider attribute
present in the SE.
iii. The examination will be conducted for three (3) hours.

Candidates shall be required to answer **ALL** questions.

Module Code and Name: MLT05209 Clinical Chemistry

QUALIFICATION: NTA Level 5 - Technician Certificate in Medical Laboratory Sciences

1.0 INTRODUCTION:

This Assessment Plan has been prepared by the Ministry of Health (MoH) in collaboration with the National Council for Technical and Vocational Education and Training (NACTVET) for the module MLT05209 Clinical Chemistry.

The Assessment Plan is one of the tools for implementing competence-based education and training (CBET) curricula. The assessor therefore, shall assess learning outcomes stipulated within the NTA level 5 curriculum flexibly based on the student's ability to show competence involving application of knowledge and skills in a broad range of work activities most of which are routine.

This Assessment Plan was developed in October 2022 from an NTA level 5 curriculum which was approved in May 2022. It has two components of the module to be assessed. These components are continuous assessment (CA) which will carry 40% of the module weight; and semester examination (SE) which will carry the remaining 60% of the module weight.

This Assessment Plan contains sub-enabling outcomes with related tasks that shall be tested in continuous assessment (CA) and semester examination (SE). A tick (√) which appears in either CA or SE column indicates the period when the task shall be assessed. Where a tick (√) appears in both CA and SE columns, the task shall be assessed in both. Tasks requiring long term accomplishment shall be assessed during the continuous assessment (CA). Other tasks require short time to accomplish; therefore, they shall be assessed during the semester examination (SE). Some tasks, which are common and cover daily Laboratory practice of the Assistant Health Laboratory Technologist after completion of this module, shall be assessed in both CA and SE. The assessor shall focus on those core areas of competences as stipulated in the curriculum.

2.0 ENABLING AND SUB-ENABLING OUTCOMES

Enabling Outcomes (Ability to……..)	**Sub-Enabling Outcomes (Ability to……..)**
4.1 Apply knowledge and skills of clinical chemistry to perform Laboratory investigations	3.3.1 Describe human disorders related to Clinical Chemistry
	3.3.2 Describe principles of Clinical chemistry investigations in clinical Laboratory
	3.3.3 Apply skills of clinical chemistry in diagnosis of diseases
3.6 Describe basic concepts of biochemistry in performing clinical chemistry tests	3.6.1 Describe concepts of biochemistry in clinical Laboratory
	3.6.2 Describe macromolecules in clinical Laboratory

	3.6.3 Describe micronutrients in clinical Laboratory

3.0 HOW TO USE THIS ASSESSMENT PLAN

Each task/competence specified in the Table below, will be assessed separately.
The tasks will be assessed during assignment, written and practical examination.
Broader tasks (indicated by √ in both Columns for CA and SE) will be assessed in CA and SE.

S/N	Sub-enabling Outcomes and Associated Task:	Competence to be Assessed				25			
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams			
1.	**Sub-enabling Outcome:** 3.3.1 Describe human disorders related to Clinical Chemistry **Tasks:**					**CA** 25 TH	PR	**SE** 23 TH	PR
	a) Define terms used in clinical chemistry *(clinical chemistry, Biochemistry, metabolism, anabolism, catabolism, enzymes and Co-enzymes)*	√				√			
	b) Explain hyper and hypo glycemic as carbohydrate metabolic disorder *(causes, clinical presentation and prevention)*			√		√		√	
	c) Explain hyper and hypo lipidemia as lipid metabolic disorder *(causes, clinical presentation and prevention)*			√		√		√	
	d) Explain hyper and hypo proteinemia as protein metabolic disorder *(causes, clinical presentation and prevention)*			√		√		√	
	e) Explain hyper and hypo uricemia as nucleic acid metabolic disorder under the following subheadings *(causes, clinical presentation and prevention)*			√		√		√	
2.	**Sub-enabling Outcome:** 3.3.2 Describe principles of Clinical chemistry investigations in clinical Laboratory **Tasks:**								
	a) Distinguish between qualitative and quantitative tests			√		√		√	
	b) Explain clinical significance of analytes *(glucose, protein and bilirubin)*			√		√		√	
	c) Explain principle of; Pandy's test, Coomassie brilliant blue method, Biurrette method, Glucose oxidase/hexokinase, fouchest test, 20% sulphosalcylic acid and bromol cresyl green			√		√		√	

3.	**Sub-enabling Outcome:** 3.3.3 Apply skills of clinical chemistry in diagnosis of diseases **Tasks:**								
	a) Perform Pandy's test to determine protein in CSF		√				√		√
	b) Perform Coomassie brilliant blue method to determine protein in CSF		√				√		√
	c) Perform Biurrette method to determine total protein in ascetic fluid, pleural fluid and serum		√				√		√
	d) Perform bromol cresyl green for serum/plasma albumin		√				√		√
	e) Perform protein in urine by using (20%) sulphosalcylic acid		√				√		√
	f) Perform Fouchest test to determine bilirubin in urine		√				√		√
	g) Perform glucose oxidase/hexokinase test to determine Glucose in serum/plasma, pleura and ascitic fluid		√				√		√
4.	**Sub-enabling Outcome:** 3.6.1 Describe concepts of biochemistry in clinical Laboratory **Tasks:**								
	a) Define terms; biochemistry, carbohydrates, proteins, lipids, amino acids, macromolecules and micro molecules and fat acid	√				√			
	b) List types of macromolecules (*carbohydrates, proteins and lipinds*)	√				√		√	
	c) List types of micronutrients (*Water soluble vitamins and fat-soluble vitamins*)	√				√		√	
5.	**Sub-enabling Outcome:** 3.6.2 Describe macromolecules in clinical Laboratory **Tasks:**								
	a) Describe carbohydrate (*Source, structure, functions)*			√		√		√	
	b) Describe proteins (Source, structure and functions)			√		√		√	
	c) Describe Lipids (Source, structure and functions)			√		√		√	
	d) Describe metabolism of macromolecules (*anabolism and catabolism*)			√		√		√	
6.	**Sub-enabling Outcome:** 3.6.3 Describe micronutrients in clinical Laboratory **Tasks:**								
	a) Describe water-soluble vitamins; vitamin B complex, vitamin C (*Source, structure and functions*)			√		√		√	
	b) Describe fat-soluble vitamins i.e., ADEK (*Source, structure and functions)*			√		√		√	

	c) Describe metabolism of micronutrients (*anabolism and catabolism*)			√		√		√	

4.0 ASSESSSMENT INSTRUCTIONS

This section describes number of examinations in a module for both Continuous Assessment (CA) and Semester Examination (SE), duration, number of questions, marks allocation and sections for each component of assessment.
It consists of two parts of the assessment; Continuous Assessment and Semester Examination. Continuous assessment shall be conducted throughout the semester and contribute 40% of the module weight and Semester Examination shall be conducted at the end of semester and contribute 60% of the module weight.

4.1 Continuous Assessment

4.1.1 Module weight

The continuous assessment shall contribute 40% of the total module weight. There shall be three (3) components of continuous assessments;

a) Written tests shall contribute 10% of the total weight
b) Practical tests shall contribute 25% of the total weight
c) Assignments shall contribute 5% of the total weight

4.1.2 Duration of assessments

The duration of each written test shall be two and half (2½) hours

4.1.3 Number of questions, marks distributions and sections

a) Written tests

There shall be two (2) written tests. The continuous written assessment test shall have five (5) sections; A, B, C, D and E

i. Section A shall comprise of twenty (20) Multiple Choice Questions each having five (5) options with a total of 20 marks (1 mark for each question)
ii. Section B shall comprise of four (4) Multiple True/False Questions each having 5 statements with a total of 10 marks (0.5 marks for each statement)
iii. Section C shall comprise of two (2) Matching Item Questions each with 5 premises and 8 responses with a total of 10 marks (5 marks for each question)
iv. Section D shall comprise of six (6) Short Answer Questions with a total of 30 marks (score for each question shall be 5 marks)
v. Section E shall comprise of two (2) Guided Essay Questions with a total of 30 marks (15 marks for each question)

In all sections candidates shall be required to answer **ALL** questions.

b) Practical tests

There shall be two practical examination paper.

i. The Practical questions will be set from the tasks which address skills or wider attribute present in the CA

ii. The examination will consist of four (4) hands on questions; each will carry twenty five (25) marks.

Candidates shall be required to answer **ALL** questions.

c) Assignments

i. There shall be two individual written assignments
ii. The assignment format will depend on the nature of competency to be assessed.
iii. Note: Objective questions are NOT ALLOWED to be assessed in the assignment.

4.2 Semester Examination

4.2.1 Module weight

The semester examination shall contribute 60% of the total module weight. There shall be two (2) components of semester examination;

a) Written examination shall contribute 20% of the total weight
b) Practical examination shall contribute 40% of the total weight

4.2.2 Duration of assessments

The duration of written examination shall be two and half (2½) hours

4.2.3 Number of questions, marks distributions and sections

a) Written examination

The semester examination shall have five (5) sections: A, B, C, D and E:

i. Section A shall comprise of twenty (20) Multiple Choice Questions each having five (5) options with a total of 20 marks (1 mark for each question)
ii. Section B shall comprise of four (4) Multiple True/False Questions each having 5 statements with a total of 10 marks (0.5 marks for each statement)
iii. Section C shall comprise of two (2) Matching Item Questions each with 5 premises and 8 responses with a total of 10 marks (5 marks for each question)
iv. Section D shall comprise of six (6) Short Answer Questions with a total of 30 marks (score for each question shall be 5 marks)
v. Section E shall comprise of two (2) Guided Essay Questions with a total of 30 marks (15 marks for each question)

In all sections candidates shall be required to answer ALL questions

b) Practical examination

i. The practical examination shall have four (4) questions each carries twenty five (25) marks
ii. The examination questions will be set from the tasks which address skills or wider attribute present in the SE.
iii. The examination will be conducted for three (3) hours.

Candidates shall be required to answer **ALL** questions.

Module Code and Name: MLT05210 Medical Parasitology

QUALIFICATION: NTA Level 5 - Technician Certificate in Medical Laboratory Sciences

1.0 INTRODUCTION:

This Assessment Plan has been prepared by the Ministry of Health (MoH) in collaboration with the National Council for Technical and Vocational Education and Training (NACTVET) for the module MLT05210 Medical Parasitology.

The Assessment Plan is one of the tools for implementing competence-based education and training (CBET) curricula. The assessor therefore, shall assess learning outcomes stipulated within the NTA level 5 curriculum flexibly based on the student's ability to show competence involving application of knowledge and skills in a broad range of work activities most of which are routine.

This Assessment Plan was developed in October 2022 from an NTA level 5 curriculum which was approved in May 2022. It has two components of the module to be assessed. These components are continuous assessment (CA) which will carry 40% of the module weight; and semester examination (SE) which will carry the remaining 60% of the module weight.

This Assessment Plan contains sub-enabling outcomes with related tasks that shall be tested in continuous assessment (CA) and semester examination (SE). A tick (√) which appears in either CA or SE column indicates the period when the task shall be assessed. Where a tick (√) appears in both CA and SE columns, the task shall be assessed in both. Tasks requiring long term accomplishment shall be assessed during the continuous assessment (CA). Other tasks require short time to accomplish; therefore, they shall be assessed during the semester examination (SE). Some tasks, which are common and cover daily Laboratory practice of the Assistant Health Laboratory Technologist after completion of this module, shall be assessed in both CA and SE. The assessor shall focus on those core areas of competences as stipulated in the curriculum.

2.0 ENABLING AND SUB-ENABLING OUTCOMES

Enabling Outcomes (Ability to……..)	**Sub-Enabling Outcomes (Ability to……..)**
3.4 Apply knowledge and skills of medical parasitology in performing Laboratory investigations	3.4.1 Describe concept of medical parasitology in diseases diagnosis
	3.4.2 Describe protozoa of medical importance in diseases diagnosis
	3.4.3 Describe helminthes of medical importance in diseases diagnosis
	3.4.4 Describe parasitological technique in diseases diagnosis
	3.4.5 Apply parasitological techniques in diseases diagnosis

3.0 HOW TO USE THIS ASSESSMENT PLAN

Each task/competence specified in the Table below, will be assessed separately.
The tasks will be assessed during assignment, written and practical examination.
Broader tasks (indicated by √ in both Columns for CA and SE) will be assessed in CA and SE.

S/N	Sub-enabling Outcomes and Associated Task:	Competence to be Assessed				21			
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams			
1.	**Sub-enabling Outcome:** 3.4.1 Describe concept of medical parasitology in diseases diagnosis **Tasks:**					**CA**		**SE**	
						21		21	
						TH	PR	TH	PR
	a) Explain terms; Medical parasitology, parasite, vector, biological vector, mechanical vector, endoparasite, ectoparasite, commensals, coprozoic, protozoa, metazoa, host, intermediate host, definitive host, reservoir host, Facultative parasite, mutualism, commensalism, obligate parasite and zoonotic parasite			√		√		√	
	b) Classify parasites of medical importance according to scientific naming (*Kingdom, Phylum, Class, Order, Super-Family, Family, Genus and Species*)			√		√		√	
	c) Classify parasites of medical importance according to location of parasites in human body (*blood, tissue, intestinal and urogenital parasites*)			√		√		√	
	d) Explain effects of parasites			√		√		√	
2.	**Sub-enabling Outcome:** 3.4.2 Describe protozoa of medical importance in diseases diagnosis**.** **Tasks:**								
	a) List protozoa of medical importance (*Entamoeba coli, Entamoeba Histolytica, Giardia lamblia, Balantidium coli, Trichomonas vaginalis, Trypanosomes rhodensies, Trypanosoma cruzi, Crytosporidium parvum, Toxoplasma gondii,*	√				√		√	

	Leishmania donovani and Plasmodium species								
	b) Describe protozoa of medical importance (*morphology, mode of transmission, life cycle, diseases they cause, clinical features, Laboratory diagnosis and drug of choice*			√		√		√	
	c) Describe prevention and control of protozoa			√		√		√	
3.	**Sub-enabling Outcome:** 3.4.3 Describe helminthes of medical importance in diseases diagnosis. **Tasks:**								
	a) Explain general morphology of helminths (*Nematodes and trematodes, cestodes*)			√		√		√	
	b) List helminths of medical importance (Nematodes*; Hook worm, Ascaris lumblicoides, Enterobius vermicularis, Trichuris trichiura, Strongyloides stercolaris, Dracunculus medinensis, Trichinella spiralis, Wuchereria bancrofti, Onchocerca volvulus, Brugia malayi, Brugia timori, Loa loa, Mansonella ozardi, Mansonella streptoceca* Cestodes; *Dipylidium caninum, Diphylobothrium latum, Echinoccous glanulosus, Echinoccous multilocularis Taenia solium, Taenia saginata. Hymenolepis nana, Hymenolepis diminuta* Trematodes; *Paragonimus westermani, Fasciola hepatica, Schistosoma mansoni Fasciolopis and Schistosoma* spp)	√				√		√	
	c) Describe helminths of medical importance (*morphology, mode of transmission, life cycle, diseases they cause, clinical features, Laboratory diagnosis, drug of choice, prevention and control)*			√		√		√	
4.	**Sub-enabling Outcome:** 3.4.4 Describe parasitological technique in diseases diagnosis **Tasks:**								
	a) Explain techniques for investigation of blood parasites (*Field stain, Giemsa stain and Buffy coat technique*)			√		√		√	
	b) Explain techniques for investigation of intestinal parasites (*Direct wet preparation, 10% Formal ether concentration technique/Formal acetone concentration technique)*			√		√		√	
	c) Explain techniques for investigation of tissue			√		√		√	

	parasites (*skin snip and blood smear*)								
	d) Explain techniques for investigation of urinary parasites and cells (*urine wet preparation*)			√		√		√	
5.	**Sub-enabling Outcome:** 3.4.5 Apply parasitological techniques in diseases diagnosis. **Tasks:**								
	a) Prepare thick blood smear for investigation of blood parasites according to SOP		√				√		√
	b) Perform Giemsa staining technique for identification of parasite (*counting method of Plasmodium spp; quantitatively MPS/WBC and MPS/micro litre*)		√				√		√
	c) Perform Buffy coat techniques for identification of motile blood parasites		√				√		√
	d) Perform wet preparation technique for investigation of intestinal parasite		√				√		√
	e) Perform Formal ether/acetone concentration technique for investigation of intestinal parasite		√				√		√
	f) Perform urine wet preparation technique for investigation of urinary parasites		√				√		√
	g) Perform urine wet preparation technique for cell counting (e.g., RBCs, WBCs, Epithelial cells etc.)		√				√		√

4.0 ASSESSSMENT INSTRUCTIONS

This section describes number of examinations in a module for both Continuous Assessment (CA) and Semester Examination (SE), duration, number of questions, marks allocation and sections for each component of assessment.

It consists of two (2) parts of the assessment; Continuous Assessment and Semester Examination. Continuous assessment shall be conducted throughout the semester and contribute 40% of the module weight and Semester Examination shall be conducted at the end of semester and contribute 60% of the module weight.

4.1 Continuous Assessment

4.1.1 Module weight

The continuous assessment shall contribute 40% of the total module weight. There shall be three (3) components of continuous assessments;

a) Written tests shall contribute 10% of the total weight
b) Practical tests shall contribute 25% of the total weight
c) Assignments shall contribute 5% of the total weight

4.1.2 Duration of assessments

The duration of each written test shall be two and half (2½) hours

4.1.3 Number of questions, marks distributions and sections

a) Written tests

There shall be two written tests. The continuous written assessment test shall have five (5) sections; A, B, C, D and E

i. Section A shall comprise of twenty (20) Multiple Choice Questions each having five (5) options with a total of 20 marks (1 mark for each question)
ii. Section B shall comprise of four (4) Multiple True/False Questions each having 5 statements with a total of 10 marks (0.5 marks for each statement)
iii. Section C shall comprise of two (2) Matching Item Questions each with 5 premises and 8 responses with a total of 10 marks (5 marks for each question)
iv. Section D shall comprise of six (6) Short Answer Questions with a total of 30 marks (score for each question shall be 5 marks)
v. Section E shall comprise of two (2) Guided Essay Questions with a total of 30 marks (15 marks for each question)

In all sections candidates shall be required to answer **ALL** questions.

b) Practical tests

There shall be two practical examination paper.

i. The Practical questions will be set from the tasks which address skills or wider attribute present in the CA
ii. The examination will consist of four (4) hands on questions; each will carry twenty five (25) marks.

Candidates shall be required to answer **ALL** questions.

c) Assignments

i. There shall be two individual written assignments
ii. The assignment format will depend on the nature of competency to be assessed.
iii. Note: Objective questions are NOT ALLOWED to be assessed in the assignment.

4.2 Semester Examination

4.2.1 Module weight

The semester examination shall contribute 60% of the total module weight. There shall be two (2) components of semester examination;

a) Written examination shall contribute 20% of the total weight
b) Practical examination shall contribute 40% of the total weight

4.2.2 Duration of assessments

The duration of written examination shall be two and half (2½) hours

4.2.3 Number of questions, marks distributions and sections

a) Written examination

The semester examination shall have five (5) sections: A, B, C, D and E:

i. Section A shall comprise of twenty (20) Multiple Choice Questions each having five (5) options with a total of 20 marks (1 mark for each question)
ii. Section B shall comprise of four (4) Multiple True/False Questions each having 5 statements with a total of 10 marks (0.5 marks for each statement)
iii. Section C shall comprise of two (2) Matching Item Questions each with 5 premises and 8 responses with a total of 10 marks (5 marks for each question)
iv. Section D shall comprise of six (6) Short Answer Questions with a total of 30 marks (score for each question shall be 5 marks)
v. Section E shall comprise of two (2) Guided Essay Questions with a total of 30 marks (15 marks for each question)

In all sections candidates shall be required to answer ALL questions.

c) Practical examination

i. The practical examination shall have four (4) questions each carries twenty five (25) marks
ii. The examination questions will be set from the tasks which address skills or wider attribute
present in the SE.
iii. The examination will be conducted for three (3) hours.

Candidates shall be required to answer **ALL** questions.

Module Code and Name: MLT05211 Cytology and Histology

QUALIFICATION: NTA Level 5 - Technician Certificate in Medical Laboratory Sciences

1.0 INTRODUCTION:

This Assessment Plan has been prepared by the Ministry of Health (MoH) in collaboration with the National Council for Technical and Vocational Education and Training (NACTVET) for the module MLT05211 Cytology and Histology.

The Assessment Plan is one of the tools for implementing competence-based education and training (CBET) curricula. The assessor therefore, shall assess learning outcomes stipulated within the NTA level 5 curriculum flexibly based on the student's ability to show competence involving application of knowledge and skills in a broad range of work activities most of which are routine.

This Assessment Plan was developed in October 2022 from an NTA level 5 curriculum which was approved in May 2022. It has two components of the module to be assessed. These components are continuous assessment (CA) which will carry 40% of the module weight; and semester examination (SE) which will carry the remaining 60% of the module weight.

This Assessment Plan contains sub-enabling outcomes with related tasks that shall be tested in continuous assessment (CA) and semester examination (SE). A tick (√) which appears in either CA or SE column indicates the period when the task shall be assessed. Where a tick (√) appears in both CA and SE columns, the task shall be assessed in both. Tasks requiring long term accomplishment shall be assessed during the continuous assessment (CA). Other tasks require short time to accomplish; therefore, they shall be assessed during the semester examination (SE). Some tasks, which are common and cover daily Laboratory practice of the Assistant Health Laboratory Technologist after completion of this module, shall be assessed in both CA and SE. The assessor shall focus on those core areas of competences as stipulated in the curriculum.

2.0 ENABLING AND SUB-ENABLING OUTCOMES

Enabling Outcomes (Ability to……..)	**Sub-Enabling Outcomes (Ability to……..)**
3.5 Apply knowledge and skills of Histology and Cytology in facilitating Laboratory investigations	3.5.1 Describe concept of cytology in diagnosis of diseases
	3.5.2 Describe concept of Histology in diagnosis of diseases
	3.5.3 Describe histological techniques as applied in Laboratory investigations
	3.5.4 Apply cytological and histological techniques in specimen fixation for Laboratory investigations

	3.5.5 Apply knowledge of Histology and Cytology in transporting specimen for Laboratory investigations

3.0 HOW TO USE THIS ASSESSMENT PLAN

Each task/competence specified in the Table below, will be assessed separately.
The tasks will be assessed during assignment, written and practical examination.
Broader tasks (indicated by √ in both Columns for CA and SE) will be assessed in CA and SE.

S/N	Sub-enabling Outcomes and Associated Task:	Competence to be Assessed				19			
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams			
1.	**Sub-enabling Outcome:** 3.5.1 Describe concept of cytology in diagnosis of diseases. **Tasks:**					**CA** 19 TH	PR	**SE** 16 TH	PR
	a) Define terms; Cytology, Dehydration, Slide smear, Aspiration, Fixatives, Stains and Mountants	√				√			
	b) Explain the methods of preparation of cytological specimen for Laboratory investigations (*50/50 ethyl-ether, air dried smear, 95% alcohol, common dye/stain used for cytological smear e.g. Papanicolaou and ZN stain*)			√		√		√	
	c) Explain the types of specimens in cytology (*Aspirates, Fine needle aspirates, Pap smear, Lavage /washings, semen, smears, and Effusions specimen*)			√		√		√	
	d) Explain the types of supplies used in cytology (*Containers, syringes with needle and Glass slides)*			√		√		√	
2.	3.5.2 Describe concept of Histology in diagnosis of diseases **Tasks:**								
	a) Define terms histology, biopsy, fixation, clearing, infiltration, embedding, trimming, sectioning, staining, mounting, decalcification, tissue section, fixatives, stains, and Mable chips	√				√			
	b) Explain methods of tissue preparation for Laboratory investigations (*Formalin fixation, grossing, tissue processing/freezing technique, embedding, tissue sectioning, tissue staining and mounting*)			√		√		√	

	c) Describe types of specimens used in histology (*biopsy autopsy, curettings and tissue chips)*			√		√		√	
	d) Explain types of equipment/supplies used in histology (*specimen containers, cassettes, moulds, scissors, surgical blades, embedding media, alcohol, clearing agents, microtome & knifes, embedding unit and tissue processor*)			√		√		√	
3.	**Sub-enabling Outcome:** 3.5.3 Describe histological techniques as applied in Laboratory investigations diseases **Tasks:**								
	a) Explain taking-in for histological specimens			√		√		√	
	b) Explain Classification of fixative used for histological examination based on; constituent, mechanism of action and reaction with soluble protein			√		√		√	
	c) Explain the principles of stains for histological techniques (*Haematoxylin and Eosin*)			√		√		√	
4.	**Sub-enabling Outcome:** 3.5.4 Apply cytological and histological techniques in specimen fixation for Laboratory investigations **Tasks:**								
	a) Explain the importance of each cytological and histological fixative (*10% formalin, 95% alcohol and 50:50 ether-ethanol*)			√		√		√	
	b) Explain the principle of cytological smear fixation techniques			√		√		√	
	c) Fix histological tissue specimen according to SOP (*10% formalin, 95% alcohol and 50:50 ether-ethanol*)		√				√		√
	d) Fix cytological smear according to SOP (*vapour, liquids and Air drying*)		√				√		√
5.	**Sub-enabling Outcome:** 3.5.5 Apply knowledge of Histology and Cytology in transporting specimen for Laboratory investigations **Tasks:**								
	a) Explain specimen transportation			√		√		√	
	b) Explain triple packaging for specimen transportation			√		√		√	
	c) List materials required for transportation of cytological and histological specimen (screw caped leak proof primary container, water tight polyethylene secondary container and outer cardboard box)	√				√		√	

	d) Transport cytological and histological specimen according to guidelines		√				√		

4.0 ASSESSSMENT INSTRUCTIONS

This section describes number of examinations in a module for both Continuous Assessment (CA) and Semester Examination (SE), duration, number of questions, marks allocation and sections for each component of assessment.

It consists of two parts of the assessment; Continuous Assessment and Semester Examination. Continuous assessment shall be conducted throughout the semester and contribute 40% of the module weight and Semester Examination shall be conducted at the end of semester and contribute 60% of the module weight.

4.1 Continuous Assessment

4.1.1 Module weight

The continuous assessment shall contribute 40% of the total module weight. There shall be three (3) components of continuous assessments;

a) Written tests shall contribute 10% of the total weight
b) Practical tests shall contribute 25% of the total weight
c) Assignments shall contribute 5% of the total weight

4.1.2 Duration of assessments

The duration of each written test shall be two and half (2½) hours

4.1.3 Number of questions, marks distributions and sections

a) Written tests

There shall be two (2) written tests. The continuous written assessment test shall have five (5) sections; A, B, C, D and E

i. Section A shall comprise of twenty (20) Multiple Choice Questions each having five (5) options with a total of 20 marks (1 mark for each question)
ii. Section B shall comprise of four (4) Multiple True/False Questions each having 5 statements with a total of 10 marks (0.5 marks for each statement)
iii. Section C shall comprise of two (2) Matching Item Questions each with 5 premises and 8 responses with a total of 10 marks (5 marks for each question)
iv. Section D shall comprise of six (6) Short Answer Questions with a total of 30 marks (score for each question shall be 5 marks)
v. Section E shall comprise of two (2) Guided Essay Questions with a total of 30 marks (15 marks for each question)

In all sections candidates shall be required to answer **ALL** questions.

b) Practical tests

There shall be two practical examination paper.

i. The Practical questions will be set from the tasks which address skills or wider attribute present in the CA

ii. The examination will consist of four (4) hands on questions; each will carry twenty five (25) marks.

Candidates shall be required to answer **ALL** questions.

c) Assignments

i. There shall be two individual written assignments
ii. The assignment format will depend on the nature of competency to be assessed.
iii. Note: Objective questions are NOT ALLOWED to be assessed in the assignment.

4.2 Semester Examination

4.2.1 Module weight

The semester examination shall contribute 60% of the total module weight. There shall be two (2) components of semester examination;

a) Written examination shall contribute 20% of the total weight
b) Practical examination shall contribute 40% of the total weight

4.2.2 Duration of assessments

The duration of written examination shall be two and half (2½) hours

4.2.3 Number of questions, marks distributions and sections

a) Written examination

The semester examination shall have five (5) sections: A, B, C, D and E:

i. Section A shall comprise of twenty (20) Multiple Choice Questions each having five (5) options with a total of 20 marks (1 mark for each question)
ii. Section B shall comprise of four (4) Multiple True/False Questions each having 5 statements with a total of 10 marks (0.5 marks for each statement)
iii. Section C shall comprise of two (2) Matching Item Questions each with 5 premises and 8 responses with a total of 10 marks (5 marks for each question)
iv. Section D shall comprise of six (6) Short Answer Questions with a total of 30 marks (score for each question shall be 5 marks)
v. Section E shall comprise of two (2) Guided Essay Questions with a total of 30 marks (15 marks for each question)

In all sections candidates shall be required to answer ALL questions.

b) Practical examination

i. The practical examination shall have four (4) questions each carries twenty-five (25) marks
ii. The examination questions will be set from the tasks which address skills or wider attribute present in the SE.
iii. The examination will be conducted for three (3) hours.

Candidates shall be required to answer **ALL** questions.

APPENDICES

ORAL EXAMINATION SCORING FORM FOR NTA LEVEL 5

Name of student ……..…

NACTVET Registration number ……...……

Date ……...

Question No	Question	Answers	Rating Scale					Examiner's remarks
			0	1	2	3	4	
Total								

Key

0……Poor *(Question wrongly answered)*

1……Fair *(Question answered by giving 25% of the required information or question answered incorrectly but occasionally adequate)*

2……Satisfactory *(Question answered correctly by giving only 50% of the required information or answered partially)*

3……Good *(Question answered correctly by giving 75% of the required information or answered in most of the content but not completely)*

4……Excellent *(Question answered correctly and precisely in proper sequence (if required)*

Examiner 1 name …….……. Signature …….……

Examiner 2 name …….……. Signature …….……

MINISTRY OF HEALTH
TECHNICIAN CERTIFICATE IN MEDICAL LABORATORY SCIENCES
MODULE: MLT05103 PRINCIPLES OF ENTREPRENEURSHIP
CONTINOUS ASSESSMENT

TEMPLATE FOR ASSESSING BUSINESS PLAN PRESENTATION

Name of institution:……..
Examination No……...
Date …… **Time: 15 Minutes**

Scoring Criteria	**Allocated marks**	**Attained score**	**Comments**
Introduction		**5**	
Appearance of the presenter (*dressing code, attitude, preparation)*	3		
Self-introduction	2		
Main body		**50**	
Ability to present a business plan overview	4		
Ability to explain the company profile	7		
Ability to summarize the performed industry analysis	5		
Ability to summarize the performed market analysis	3		
Ability to present a brief marketing plan	10		
Ability to describe the management team and personnel requirement	10		
Ability to highlight the production and operations plan	3		
Ability to justify the financial forecast	3		
Able to give an overview on risk assessment	5		
Presentation skills		**45**	
Speaker maintains good eye contact with the audience and is appropriately animated (e.g. gestures, moving around)	5		
Speaker uses a clear, audible voice.	5		
Information is presented in a logical sequence.	5		
Language skills and pronunciation	5		
Ownership of the business plan (explaining the contents and not reading everything)	10		
Arrangement of power point slides and contents (organization)	5		
Time management skills	5		

Ability to respond to questions correctly	5		
TOTAL	**100**		

Examiner's name …..... Signature: ..... Date: ……

MINISTRY OF HEALTH

TECHNICIAN CERTIFICATE IN MEDICAL LABORATORY SCIENCES

MODULE: MLT05103 PRINCIPLES OF ENTREPRENEURSHIP

END OF SEMESTER I EXAMINATION

CHECKLIST FOR ASSESSING BUSINESS PLAN

NAME OF

INSTITUTION:……

NACTVET Reg No…….. **Examination**

No……...

Date …….

SN	Scoring Criteria	Description	Allocated Marks	Attained Score	Remarks
1.	Formatting	Font (*Times New Roman, font size 12*)	1		
		General text (*1.5 line spacing*)	1		
		Page number (*centered at the bottom of the page*)	1		
		Justification (*both left and right*)	1		
		Headings (*chapter heading print size 16 in bold typeface. Sub heading print size 14 in **bold** typeface*)	1		
2.	Cover Page	The full name of your business	2		
		Business address	2		
		Registration number	1		
		Contact details (*Phone number and e-mail*)	2		
		Date the Business plan was completed.	1		
3.	Table of contents	Include a table of contents for readers to find specific information)	3		2
4.	Executive summary	It should be brief, but should provide the reader with complete overview of the entire business plan. It should not exceed two pages. (*It should contain; Vision/Mission Statement, Company Summary, Products/Services, Market Assessment, Strategic Implementation, Expected Outcomes*)	5		

5.	Company description	Vision statement	3		
		Mission statement	3		
		Products / services available (*Breadth of service line*)	2		
		Legal status and ownership	2		
		Key partners (*if any*)	1		
6.	Industry analysis	Industry size	3		
		Industry structure	3		
		Nature of participants	3		
		Key success factors	3		
		Long term objectives	3		

7.	Market analysis	Selection of target market	2		
		Target market segmentation	2		
		Prediction of buyers' behaviour	2		
		Competitor analysis (*size, quality of human resources, technology, breadth of services, pricing mechanisms, after sale services)*	2		
8.	Marketing plan	Project market share	3		
		Positioning of business	3		
		Price and Pricing mechanism	4		
		Distribution	3		
		Promotion plans	4		
		Sales potential	3		
		Analyse competitors	3		
9.	Management team and personnel	Management qualifications and structure	5		
		Number and type of employees required.	5		
10.	Production and operations plan	Premises	3		
		Production facilities and management	3		
		Information system and IT	2		
11.	Financial forecast	Cash flow statement	1		
		Income statement	1		
		Balance sheet	1		
12.	Risk assessment	Reasonable measures in place to deal with competitors to increase market share and protect assets, personnel and customers	1		
		TOTAL	**100**		

Internal Examiner ……..……..……

Signature ……..……

External Examiner ……..……..……

Signature ……..……