

THE UNITED REPUBLIC OF TANZANIA



Ministry of Health

**Assessment Plans for Ordinary Diploma (NTA Level 6)
in Medical Laboratory Sciences**

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LIST OF ABBREVIATIONS

ACD	-	Acid Citrate Dextrose
AIDS	-	Acquired Immunodeficiency Syndrome.
BS	-	Blood Slide
CA	-	Continuous Assessment
CBET	-	Competence Based Education Training
CD	-	Compact Disc
CPD	-	Citrate Phosphate Dextrose
CPDA	-	Citrate Phosphate Dextrose Adenine
DECOHAS	-	DECCA College of Health and Allied Sciences
EDTA	-	Ethylene Diamine Tetraacetic Acid
EQA	-	External Quality Assessment
HIV	-	Human Immunodeficiency Virus.
HLPC	-	Health Laboratory Practitioners' Council
HLS	-	Health Laboratory Sciences
IQC	-	Internal Quality Control
ISBN	-	International Standard Book Number
KOH	-	Potassium Hydroxide
MLT	-	Medical Laboratory Technician
MoH	-	Ministry of Health
MRDT	-	Malaria Rapid Diagnostic Test
MS	-	Microsoft Word
MUHAS	-	Muhimbili University of Health and Allied Sciences
NACTVET	-	National Council for Technical and Vocational Education and Training
NTA	-	National Technical Awards
OSPE	-	Objective Structured Practical Examination
PEP	-	Post Exposure Prophylaxis or Post Exposure Procedure
pH	-	Potential of Hydrogen ions
PHLB	-	Private Health Laboratories Board
PPE	-	Personal Protective Equipment
PPM	-	Planned Preventive Maintenance
QC	-	Quality Control.
SE	-	Semester Examination
SOP	-	Standard Operating Procedures
spp	-	Species
TACoHAS	-	Tanga College of Health and Allied Sciences
TAT	-	Turn Around Time
TB	-	Tuberculosis
WR	-	Written
ZN	-	Ziehl Neelsen

MOCOHAS - Morogoro College of Health and Allied Science
HTIs - Health Training Institutions

ACKNOWLEDGEMENT

The development of these Assessment Plans for Ordinary Diploma (NTA level 6) 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.

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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 Ordinary Diploma (NTA level 4) 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 6 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 Ordinary Diploma (NTA level 6) 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 non-routine.

This document contains assessment plans for five (5) modules of semester I and five (5) modules for semester II as stipulated in the curriculum for Ordinary Diploma (NTA level 6) 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 and Name: MLT06101 Laboratory Quality Management

QUALIFICATION: NTA Level 6 – Ordinary Diploma in Medical Laboratory Sciences

1.0. INTRODUCTION

This assessment plan has been prepared by the Ministry of Health (MoH) under the guidance of the National Council for Technical and Vocational Education and Training (NACTVET) for the module **MLT06101 Laboratory Quality 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 6 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 non-routine.

This assessment plan was developed in October 2022 from an NTA level 6 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 duration to accomplish 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 clinical practice of the Health Laboratory Technologist, 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	Sub-Enabling Outcomes
1.1 Apply quality system essentials to manage laboratory practices	1.1.1 Describe laboratory quality system essentials to manage laboratory practices
	1.1.2 Apply skills of laboratory quality system elements in implementation of laboratory activities
	1.1.3 Apply skills of laboratory quality system elements in implementation of quality assurance activities in the laboratory
	1.1.4 Describe the concepts of laboratory accreditation processes for improvement of laboratory services
1.2 Apply quality management system to evaluate laboratory practices	1.2.1 Apply knowledge and skills of quality assurance in preparation of Internal Quality Control (IQC) samples
	1.2.2 Apply knowledge and skills of Plan, Do, Check and Act (PDCA) cycle to establish quality improvement projects
	1.2.3 Apply quality management skills to perform External Quality Assessment (EQA) in the laboratory
	1.2.4 Apply knowledge and skills of quality system in verification and validation of laboratory diagnostic methods
1.3 Apply quality management system to monitor client satisfaction	1.3.1 Apply concept of customer satisfaction in the laboratory practices
	1.3.2 Apply knowledge and skills of quality management system in monitoring quality indicators in the laboratory services
	1.3.3 Apply skills of quality management system to ensure staff competence in the laboratory
1.4 Apply principles of bio-safety and bio-security to manage laboratory practices	1.4.1 Describe the concept of bio-safety and bio-security in laboratory practices
	1.4.2 Describe measures of bio-safety and bio-security to evaluate laboratory practices
	1.4.3 Apply skills of bio-safety and bio-security in evaluation of laboratory safety

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 through 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 Related Task	Competence to be Assessed				75		
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams		
1.						CA		SE
						74	30	57
						TH	ORAL	TH
	Sub-enabling Outcome: 1.1.1 Describe Laboratory quality system essential elements to manage laboratory practices							
	Related Tasks:							
	a) Define laboratory quality system essential elements	√				√		
	b) Describe 12 elements of quality system essentials			√		√		√
	c) Describe performance indicators of quality assurance activities (<i>sample rejection rate, customer satisfaction, reagent stock out, equipment down time, TAT, personnel, productivity, and EQA</i>).			√		√		√
2.	Sub-enabling Outcome: 1.1.2 Apply skills of laboratory quality system essential elements in implementation of laboratory activities							
	Related Tasks:							
	a) List 12 laboratory quality system essential elements	√				√	√	

S/N	Sub-enabling Outcomes and Related Task	Competence to be Assessed				75		
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams		
	b) Prepare plan for laboratory quality system activities in improvement of laboratory services (<i>Improvement projects, staff meeting, staff competency assessment, calibration status, trainings, evaluation & audit, equipment PPM, Management review e.t.c</i>)				√	√		√
	c) Identify tools for assessing laboratory quality system elements (<i>WHO SLIPTA, SADCAS, KENAS, 5S-KAIZEN, ISS, and EHPA Checklists</i>)		√			√	√	
	d) Assess quality system elements using assessment tool (<i>WHO SLIPTA, SADCAS, KENAS, 5S-KAIZEN, ISS, and EHPA Checklists</i>)				√	√		√
	e) Identify non-conformances reported during assessment in the laboratory			√		√	√	
	f) Prepare an action plan for improvement of laboratory services		√			√		√
	g) Implement the action plan to rectify non-conformances				√	√		√
	h) Monitor and evaluate implementation of the action plan				√	√		√
	i) Analyse data to monitor quality of laboratory services (<i>mean, mode, median, standard deviation, coefficient of variation (%CV), sensitivity, specificity, predictive values, regression, accuracy/bias, correlation and Z-score</i>)				√	√		√
	j) Prepare a report of laboratory quality system activities (<i>improvement projects</i>)		√			√		√
3.	Sub-enabling Outcome: 1.1.3 Apply skills of laboratory quality system elements in implementation of quality assurance activities in the laboratory							

S/N	Sub-enabling Outcomes and Related Task	Competence to be Assessed				75		
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams		
	Related Tasks							
	a) Develop tools to monitor quality indicators in pre analytical phase (<i>specimen rejection form, and turnaround time log</i>)		√			√		√
	b) Use tools to monitor quality indicators in pre analytical phase		√			√		√
	c) Develop tools to monitor quality indicators in analytical phase (<i>internal quality control chart, temperature chart, reagent consumption log, and equipment maintenance logs</i>)		√			√		√
	d) Use tools to monitor quality indicators in analytical phase		√			√		√
	e) Develop tools to monitor quality indicators of post analytical phase (<i>Release result verification form, documentation and communication of critical result log, and result dispatch log</i>)		√			√		√
	f) Use tools to monitor quality indicators of post analytical phase		√			√		√
4.	Sub-enabling Outcome: 1.1.4 Describe the concepts of laboratory accreditation process for improvement of laboratory services							
	Related Tasks							
	a) Define the term accreditation	√				√		
	b) Explain the processes of accreditation in Tanzania (<i>Enrolment, Participation and Feedback</i>)			√		√	√	√
	c) List programmes involved in accreditation processes (<i>SLMTA, SLIPTA, SADCAS and KENAS</i>)	√				√	√	√
	d) Explain importance of laboratory accreditation			√		√	√	√

S/N	Sub-enabling Outcomes and Related Task	Competence to be Assessed				75		
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams		
	e) List accreditation bodies (e.g., ASFBT, CAP, SANAS, SADCAS, and KENAS)	√				√	√	√
5.	Sub-enabling Outcome: 1.2.1 Apply knowledge and skills of quality assurance in preparation of Internal Quality Control (IQC) samples Related Tasks							
	a) Define Internal Quality Control (IQC) samples	√				√	√	
	b) List qualities of good internal quality control samples	√				√	√	√
	c) Explain the procedure for preparing quality control samples			√		√	√	√
	d) Prepare IQC samples for laboratory tests		√			√		√
	e) Perform quality check of prepared IQC samples		√			√		√
	f) Document IQC procedures and results		√			√		√
6.	Sub-enabling Outcome: 1.2.2 Apply knowledge of Plan, Do, Check and Act (PDCA) cycle to establish quality improvement projects Related Tasks							
	a) Define PDCA cycle	√				√		
	b) Describe phases of PDCA cycle			√		√		√
	c) Explain importance of PDCA cycle			√		√	√	√
7.	Sub-enabling Outcome: 1.2.3 Apply quality management skills to perform External Quality Assessment (EQA) in the laboratory Related Tasks							
	a) Accession EQA samples				√	√		√
	b) Perform EQA tests		√			√		√

S/N	Sub-enabling Outcomes and Related Task	Competence to be Assessed				75		
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams		
	c) Review and send EQA results		√			√		√
	d) Review EQA feedback report		√			√		√
	e) Prepare EQA performance report		√			√		√
8.	Sub-enabling Outcome: 1.2.4 Apply knowledge and skills of quality system in verification and validation of laboratory diagnostic methods Related Tasks							
	a) Explain verification process			√		√	√	√
	b) Explain validation process			√		√	√	√
	c) Describe measures of verification and validation in the laboratory (<i>accuracy, precision, carry-over, linearity, standard deviation, specificity and sensitivity</i>)			√		√		√
	d) Explain the importance of performing verification and validation of methods in the laboratory			√		√	√	√
	e) Explain the importance of documenting verification and validation reports			√		√	√	√
	f) Verify laboratory diagnostic methods (<i>accuracy, sensitivity, specificity, precision linearity and limit of detection</i>)		√			√		√
9.	Sub-enabling Outcome: 1.3.1 Apply concept of customer satisfaction in the laboratory practices Related Tasks							
	a) Describe components of customer satisfaction in the laboratory practices (<i>timely provision of service, accurate laboratory results, professionalism {customer care and attire}</i>)			√		√		√

S/N	Sub-enabling Outcomes and Related Task	Competence to be Assessed				75		
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams		
	b) Outline methods of collecting customer complaints/suggestions/opinions (<i>Suggestion box, complaint & complimentary office, exit interview, instant feedback, customer feedback survey, social media, email and telephones</i>)			√		√		√
	c) Develop tools to monitor customer satisfaction (<i>customer satisfaction questionnaire, exit interview checklist and suggestion box</i>)		√			√		√
	d) Conduct customer satisfaction survey (<i>exit interview and questionnaire</i>)				√	√		√
	e) Collect customer opinions using suggestion box				√	√		√
	f) Analyse findings and opinions from customer satisfaction survey				√	√		√
	g) Perform corrective measures to improve customer services			√		√		√
10.	Sub-enabling Outcome: 1.3.2 Apply knowledge and skills of quality management system in monitoring quality indicators in the laboratory services Related Task							
	a) List quality indicators as per facility policy (<i>e.g., TAT, IQC, Sample rejection, Client feedback, EQA, reagent stock outs, equipment down time e.t.c</i>)	√				√	√	√
	b) Explain quality indicators in the laboratory services			√		√	√	√

S/N	Sub-enabling Outcomes and Related Task	Competence to be Assessed				75		
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams		
	c) Explain importance of monitoring quality indicators in the laboratory services (<i>e.g., provision of quality test results, assessing the quality of laboratory services</i>)			√		√	√	√
	d) Identify characteristics of quality indicators (<i>Measurable, achievable, interpretable, actionable, balanced, engaging, and time bound</i>)	√				√	√	√
	e) Assess customer satisfaction using checklist/questionnaire to monitor provision of quality laboratory services				√	√		
	f) Conduct on job training on test manual to avoid high rate of specimen's rejection				√	√		
	g) Monitor turn-around time to improve laboratory services		√			√		√
	h) Use Levey-Jennings Chart to monitor quality of results		√			√		√
11.	Sub enabling Outcome: 1.3.3 Apply skills of quality management system to ensure staff competence in the laboratory Related Task							
	a) Develop staff competence assessment tools (<i>written, practical, observational and oral exams</i>)		√			√		√
	b) Conduct staff competence assessment				√	√		√
	c) Conduct re-training to improve competence of laboratory personnel				√	√		√
12.	Sub enabling Outcome: 1.4.1 Describe the concept of Bio-safety and Bio-security in laboratory practices							

S/N	Sub-enabling Outcomes and Related Task	Competence to be Assessed				75		
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams		
	Related Task							
	a) Define the following terms: laboratory biosafety, laboratory biosecurity, risk group, risk level	√				√	√	
	b) List criteria for assessment of bio-safety and bio-security containment level (<i>Type of organism, risk level and laboratory procedure</i>)	√				√	√	
	c) Explain levels of the laboratory bio-safety (<i>I, II, III, and IV</i>)			√		√	√	√
	d) Explain requirements of each bio-safety level			√		√	√	√
13	Sub enabling Outcome: 1.4.2 Describe measures of bio-safety and bio-security to evaluate laboratory practices Related Task							
	a) List bio-safety measures (<i>use of PPE, engineering devices, good laboratory practice, chemical disinfection, PEP, Immunization, self-awareness, good laboratory design and training</i>)	√				√	√	
	b) List elements of effective safety managements (<i>designation of a safety officer, assessments of risk in the work place, development of exposure control plan, development of safety guidelines and procedure, employee training and hazard communication</i>)	√				√	√	
	c) Explain the elements of bio-security (<i>physical security, personnel security, information security, transport security, material control and accountability</i>)			√		√	√	√

S/N	Sub-enabling Outcomes and Related Task	Competence to be Assessed				75		
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams		
	d) Explain elements of bio-safety (<i>lab. practices and procedures, safety equipment and facility design construction</i>)			√		√	√	√
14.	Sub enabling Outcome: 1.4.3 Apply skills of bio-safety and bio-security in evaluation of laboratory safety Related Task							
	a) Develop bio-safety and bio-security evaluation checklist				√	√		√
	b) Evaluate the bio-safety status of a laboratory				√	√		√
	c) Write evaluation report		√			√		
	d) Communicate evaluation report				√	√	√	
	e) Keep records of evaluation report		√			√		

KEY:

CA **Continuous Assessment**
SE **Semester Examination**
TH **Theory Examination**

4.0. ASSESSMENT 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

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

- a) Written tests shall contribute 25% of the total weight
- b) Assignments shall contribute 5% of the total weight
- c) Oral 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 tests during CA. The written test 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) Assignments

- i. There shall be two written individual assignments
- ii. Assignments shall be set from competences which address wider attributes.
- iii. Note: Objective questions are NOT ALLOWED to be assessed in the assignment

c) ORAL

- 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 consist of written component only which contribute 60% of the total weight of the module.

4.2.2 *Duration of assessments*

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

NACTEVET Reg No.....

Examination No.....

MINISTRY OF HEALTH

ORDINARY DIPLOMA (NTA LEVEL 6) IN MEDICAL LABORATORY SCIENCES

END OF SEMESTER I EXAMINATION

MODULE CODE: MLT 06101

MODULE NAME: LABORATORY QUALITY MANAGEMENT

OCTOBER, 2022

TIME: 2: 30 HOURS

DATE.....

GENERAL INSTRUCTIONS:

- 1. Read all instructions carefully.**
- 2. This paper consists of FIVE (5) sections.**
- 3. Attempt all questions.**
- 4. Write your examination number on each page of the answer sheet you use.**
- 5. Each essay question to be answered on not more than 3 hand written papers**

The table below is for OFFICIAL USE ONLY

SECTION	TYPE OF QUESTIONS	ALLOCATED MARKS	SCORED MARKS	INITIAL SIGNATURE OF MARKER	INITIAL SIGNATURE OF VERIFIER
A	MULTIPLE CHOICE	20			
B	MULTIPLE TRUE/FALSE	10			
C	MATCHING ITEM	10			
D	SHORT ANSWER	30			
E	GUIDED ESSAY	30			
TOTAL		100			

Module Code and Name: MLT06102 Operational Research

QUALIFICATION: NTA Level 6–Ordinary Diploma 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 **MLT06102 Operational Research**

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 6 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 non-routine.

This assessment plan was developed in October 2022 from an NTA level 6 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 clinical practice of the 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
3.2 Apply knowledge and skills of research in managing human diseases and health related events	3.2.1 Describe concepts of research in health settings
	3.2.2 Describe processes of conducting operational research
	3.2.3 Describe the concept of research to develop research proposal
	3.2.4 Apply research skills in developing research proposal
	3.2.5 Apply research skills in collecting, processing and analyzing data
	3.2.6 Apply skills of research to write research project report
	3.2.7 Apply concept of information dissemination to improve health care services

4 HOW TO USE THIS ASSESSMENT PLAN

Each task/competence specified in the Table below will be assessed separately.

The tasks will be assessed through 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.

5 Table of specification

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

S/N	Sub-enabling Outcomes and Related 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: 3.2.1 Describe concepts of research in health settings					CA		SE	
						43	12	21	11
						T H	RP	T H	R R
	Related Tasks:								
	a) Explain terminologies commonly used in research (<i>research, epidemiological studies, and health systems</i>)			✓		✓			
	b) Describe principles and importance of research methodology			✓		✓		✓	
	c) Outline characteristics of research	✓				✓			
	d) Describe the three categories (types) of epidemiological studies (<i>descriptive, observational and experimental</i>)			✓		✓		✓	
	e) List advantages of each category of epidemiological study	✓				✓		✓	
	f) Identify other types of operational research	✓				✓			
	g) Outline challenges in conducting epidemiological research	✓				✓		✓	

S/N	Sub-enabling Outcomes and Related Task	Competence to be Assessed				45			
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams			
	h) Explain principles of conducting epidemiological research			√		√		√	
2.	Sub-enabling Outcome: 3.2.2 Describe processes of conducting operational research Related Tasks:								
	a) Describe principles of operational research			√		√		√	
	b) Explain steps for conducting research			√		√		√	
	c) Explain challenges for conducting operational research			√		√		√	
	d) Explain process of problem identification			√		√		√	
	e) Outline sources of data	√				√		√	
	f) Explain sample and sampling procedure			√		√		√	
	g) Explain data collection methods and tools			√		√		√	
	h) Outline methods of data processing and analysis	√				√		√	
	i) Explain format of research report writing			√		√		√	
3.	Sub-enabling Outcome: 3.2.3 Describe the concept of research to develop research proposal Related Tasks:								
	a) Define terms; (<i>proposal and research proposal, objective, hypotheses, methodology, work plan and budget</i>)	√				√			
	b) List components of a research proposal	√				√			
	c) Identify research title	√				√	√		
	d) Describe process of developing research proposal			√		√	√		
4.	Sub-enabling Outcome: 3.2.4 Apply research skills in developing research proposal Related Tasks:								

S/N	Sub-enabling Outcomes and Related Task	Competence to be Assessed				45			
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams			
	a) Write introduction to research title			√		√	√		
	b) Generate statement of the problem			√		√	√		
	c) Conduct literature review related to the research objectives			√		√	√		
	d) Develop research objectives			√		√	√		
	e) Access and write references using Vancouver or Harvard style			√		√	√		
	f) Identify methodology of the research	√				√	√		
	g) Develop research work plan		√			√	√		
	h) Develop research budget		√			√	√		
5.	Sub-enabling Outcome: 3.2.5 Apply research skills in collecting, processing and analyzing data Related Tasks:								
	a) Define the terms; data collection, data processing, data analysis	√				√			
	b) Describe various data collection techniques			√		√	√	√	√
	c) Describe the main stages in data collection			√		√		√	√
	d) Explain the sequence of data collection			√		√		√	√
	e) Identify issues that can affect data quality and how to address them	√				√		√	√
	f) Prepare a plan for data collection for the research proposal you are developing		√				√		
	g) Explain the purpose of making a plan for processing and analysis of data			√		√			
	h) Identify important components of data processing	√				√		√	
	i) Perform data analysis using statistical package (SPSS/Epi info)		√			√			√
	j) Perform statistical test to analyse data (<i>measure of variability and measure of central tendency</i>)		√			√			√
6.	Sub-enabling Outcome: 3.2.6 Apply skills of research to write research project report								

S/N	Sub-enabling Outcomes and Related Task	Competence to be Assessed				45			
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams			
	Related Tasks:								
	a) Define a research project report	√				√			
	b) Describe the main essential components of a complete research project report			√		√		√	√
	c) Write a research project report			√					√
7.	Sub-enabling Outcome: 3.2.7 Apply concept of information dissemination to improve health care services								
	Related Tasks:								
	a) Write recommendations based on your research findings			√		√			√
	b) Describe strategies for dissemination of your report			√		√		√	√
	c) Disseminate findings for health care improvements			√					√

4.0 ASSESSMENT 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 (4) components of continuous assessments,

- a) Written assignment which shall contribute 5% of the total weight
- b) Written tests shall contribute 15% of the total weight
- c) Written research proposal shall contribute 10% of the total weight and
- d) Oral presentation of research proposal shall contribute 10% of the total weight

4.1.2 Duration of assessments

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

- b) ***Oral presentation (Presentation of the research proposals)***

Presentation of the research proposals shall be for 25 minutes, whereby 15 minutes will be for presentation and 10 minutes for discussion.

4.1.3 Number of questions, marks distributions and sections

- a) ***Written tests***

There shall be minimum of two written tests during CA. The written tests 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) Assignments

- iv. There shall be two written individual assignments
- v. Assignments shall be set from competences which address wider attributes.
- vi. 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 weight of the module. There shall be a written examination which comprises of the following components;

- a) Written examination shall contribute 20% of the total weight
- b) Research report presentation (oral examination) shall contribute 10% of the total weight
- c) Written Research report shall contribute 30% of the total weight.

4.2.2 Duration of assessment

The duration of each written test shall be two and half (2½) hours and research report presentation shall be 25 minutes (15 minutes for presentation and 10 minutes for discussion)

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) Written Research Report

Each student is required to submit ONE written complete individual Research Report at the end of semester I.

NACTEVET Reg No.....

Examination No.....

MINISTRY OF HEALTH

ORDINARY DIPLOMA (NTA LEVEL 6) IN MEDICAL LABORATORY SCIENCES

END OF SEMESTER I EXAMINATION

MODULE CODE: MLT 06102

MODULE NAME: OPERATIONAL RESEARCH

OCTOBER, 2022

TIME: 2: 30 HOURS

DATE.....

GENERAL INSTRUCTIONS:

- 6. Read all instructions carefully.**
- 7. This paper consists of FIVE (5) sections.**
- 8. Attempt all questions.**
- 9. Write your examination number on each page of the answer sheet you use.**
- 10. Each essay question to be answered on not more than 3 hand written papers**

The table below is for OFFICIAL USE ONLY

SECTION	TYPE OF QUESTIONS	ALLOCATED MARKS	SCORED MARKS	INITIAL SIGNATURE OF MARKER	INITIAL SIGNATURE OF VERIFIER
A	MULTIPLE CHOICE	20			
B	MULTIPLE TRUE/FALSE	10			
C	MATCHING ITEM	10			
D	SHORT ANSWER	30			
E	GUIDED ESSAY	30			
TOTAL		100			

Module Code and Name: MLT06103 Principles of Epidemiology and Biostatistics

QUALIFICATION: NTA Level 6–Ordinary Diploma in Medical Laboratory Sciences

1.0 INTRODUCTION:

This assessment plan has been prepared by the Ministry of Health (MoH) under the guidance of the National Council for Technical and Vocational Education and Training (NACTVET) for the module MLT06103 **Principles of Epidemiology and Biostatistics**

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 6 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 non-routine.

This assessment plan was developed in October 2022 from an NTA level 6 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 clinical practice of the 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 epidemiology in managing human diseases and health related events	3.1.1 Describe concepts of epidemiology in managing human diseases and health related events
	3.1.2 Describe ecological and epidemiological disease causation
	3.1.3 Describe epidemiological study design to study disease in population
	3.1.4 Describe different epidemiological approaches in prevention and control of human diseases
	3.1.5 Describe measures of disease occurrence and association
	3.1.6 Apply concepts of testing and screening in managing disease and health related events
	3.1.7 Apply knowledge and skills of epidemiology in promoting community health
3.3 Apply knowledge and skills of biostatistics in managing human diseases and health related events	3.3.1 Describe biostatistics concepts used in collection and evaluation of health data
	3.3.2 Apply knowledge and skills of biostatistics in data collection
	3.3.3 Apply knowledge and skills of basic biostatistics in compiling research data
	3.3.4 Apply knowledge and skills of biostatistics in presenting research data

4 HOW TO USE THIS ASSESSMENT PLAN

Each task/competence specified in the Table below will be assessed separately.

The tasks will be assessed through 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.

5 Table of specification

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

S/N	Sub-enabling Outcomes and Related Task	Competence to be Assessed				47		
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester		
1.	Sub-enabling Outcome: 3.1.1 Describe concepts of epidemiology in managing human diseases and health related events					CA		SE
	Related Tasks:					41	19	39
						TH	O R A L	SE
	a) Define the term Epidemiology	✓				✓		
	b) Identify components of epidemiology (<i>Population, Health related condition, distribution and determinants</i>)	✓				✓		✓
	c) Explain Historical Evolution of Epidemiology		✓			✓		✓
	d) Explain the importance of epidemiological data in managing disease and health related events		✓			✓		✓
2.	e) Explain core epidemiological functions (<i>public health surveillance, Field investigations, Analytic studies, Program evaluation, and policy development</i>)		✓			✓		✓
	Sub-enabling Outcome; 3.1.2 Describe ecological and epidemiological disease causation							
	Related Tasks:							

	a) Explain natural history and spectrum of diseases			√		√		√
	b) Explain concepts of disease occurrence			√		√		√
	c) Explain the determinants of health and disease			√		√		√
	d) Identify factors related to disease causation	√				√		√
	e) Explain the epidemiological triangle (<i>agent, host and environment</i>)			√		√		√
	f) Explain chain of infection (<i>infectious agent, susceptible host, portal of entry, mode of transmission, portal of exit and reservoir</i>)			√		√		√
	g) Explain occurrences of epidemic diseases			√		√		√
	h) Explain outbreak investigation			√		√		√
3.	Sub-enabling Outcome: 3.1.3 Describe epidemiological study design to study diseases in population Related Tasks:							
	a) Define the following terms: (<i>Cohort study, Case control study, Cross sectional study, Case series, retrospective study and prospective study</i>)	√				√		
	b) Explain advantages of each study design for estimating disease occurrence			√		√		√
	c) Explain disadvantages of each study design for estimating disease occurrence			√		√		√
	d) Explain qualitative study techniques (<i>e.g., survey, observational, focus group discussion, interviews and secondary research</i>)			√		√		√
	e) Explain quantitative study technique (<i>e.g., experimental</i>)			√		√		√
4	Sub-enabling Outcome: 3.1.4 Describe different epidemiological approaches in prevention and control of human diseases Related Tasks:							
	a) Explain the levels of diseases prevention (<i>Primordial, Primary, Secondary and Tertiary</i>)			√		√		√
	b) Explain <i>approaches</i> of infection prevention (<i>High risk approach and population approach</i>)			√		√		√
	c) Explain control approaches of diseases (4Cs - <i>Cases, Contacts, Carriers and Community</i>)			√		√		√
5	Sub-enabling Outcome: 3.1.5 Describe measures of disease occurrence and association							

	Related Tasks:							
	a) Define terms; prevalence, incidence, epidemic, pandemic, endemic, holoendemic	√				√		
	b) Explain Measures of prevalence			√		√		√
	c) Explain Measures of incidence			√		√		√
6.	Sub-enabling Outcome: 3.1.6 Apply concepts of testing and screening in managing disease and health related events Related Tasks:							
	a) Define terms: screening, sensitivity, specificity, positive predictive value, negative predictive value, accuracy, precision, reliability and validity	√				√		
	b) Explain characteristics of an ideal screening test (<i>sensitive, minimal discomfort, reliable, valid, easy to use and less expensive</i>)			√		√	√	√
	c) List sources of unreliable results in terms of precision & accuracy	√				√	√	
7.	Sub-enabling Outcome: 3.1.7 Apply knowledge and skills of epidemiology in promoting community health Related Tasks:							
	a) Explain the terms; community, community health participation, community health promotion, community health education			√		√	√	
	b) Explain methods of managing diseases in a population			√		√	√	√
	c) Conduct community health promotion sessions		√			√		√
8.	Sub-enabling Outcome: 3.3.1 Describe biostatistics concepts used in collection and evaluation of health data Related Tasks:							
	a) Explain the following terminologies used in biostatistics; mode, median, mean, standard deviations, variance, range and data stratification			√		√	√	√
	b) Explain importance of biostatistics			√		√	√	√
	c) Outline importance of data stratification	√				√		√

	d) Outline different sources of statistical data (<i>e.g., survey, National bureau of statistics, census, laboratory records, program surveillance unit, medical records etc.</i>)	√				√	√	√
	e) Describe main methods of collecting statistical data			√		√		√
9.	Sub-enabling Outcome: 3.3.2 Apply knowledge and skills of biostatistics in data collection Related Tasks:							
	a) Identify tools used in statistical data collection	√				√	√	√
	b) Develop tools for data collection		√			√		√
	c) Use tools for data collection			√		√		√
10.	Sub-enabling Outcome: 3.3.3 Apply knowledge and skills of basic biostatistics in compiling research data Related Tasks							
	a) Explain methods of statistical data stratification			√		√	√	√
	b) Explain levels of statistical data measurement (<i>nominal, ordinal, interval, ratio</i>)			√		√		√
	c) Compile research data using appropriate statistical methods (<i>Microsoft Excel, SPSS and Epi Info</i>)			√		√		
11.	Sub-enabling Outcome: 3.3.4 Apply knowledge and skills of basic biostatistics in presenting research data Related Tasks							
	a) Define the term; data, data presentation	√				√		
	b) List importance of data presentation	√				√		
	c) Explain the methods of data presentation (tables, charts, maps/pictorial and narrative)			√		√	√	√
	d) Present data using (tables, charts, maps/pictorial and narrative)			√		√	√	√
	e) Analyse data by using Microsoft excel			√		√	√	√
	f) Analyse data using Statistical Package for Social Sciences (<i>SPSS</i>)			√		√		√

ASSESSMENT 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 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 tests during CA. The written tests 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) Assignments

- i. There shall be two written individual assignments
- ii. Assignments shall be set from competences which address wider attributes.
- iii. Note: Objective questions are NOT ALLOWED to be assessed in the assignment

c) ORAL

- 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 ask an alternative panel to score a the candidate
- 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 consist of written component only which contribute 60% of the total weight of the module.

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.

NACTEVET Reg No.....

Examination No.....

MINISTRY OF HEALTH

ORDINARY DIPLOMA (NTA LEVEL 6) IN MEDICAL LABORATORY SCIENCES

END OF SEMESTER I EXAMINATION

MODULE CODE: MLT 06103

MODULE NAME: PRINCIPLES OF BIOSTATISTICS AND EPIDEMIOLOGY

OCTOBER, 2022

TIME: 2: 30 HOURS

DATE.....

GENERAL INSTRUCTIONS:

11. Read all instructions carefully.

12. This paper consists of FIVE (5) sections.

13. Attempt all questions.

14. Write your examination number on each page of the answer sheet you use.

15. Each essay question to be answered on not more than 3 hand written papers

The table below is for OFFICIAL USE ONLY

SECTION	TYPE OF QUESTIONS	ALLOCATED MARKS	SCORED MARKS	INITIAL SIGNATURE OF MARKER	INITIAL SIGNATURE OF VERIFIER
A	MULTIPLE CHOICE	20			
B	MULTIPLE TRUE/FALSE	10			
C	MATCHING ITEM	10			
D	SHORT ANSWER	30			
E	GUIDED ESSAY	30			
TOTAL		100			

Module Code and Name: MLT06104 Leadership and Management

QUALIFICATION: NTA Level 6–Ordinary Diploma 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 **MLT06104 Leadership and 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 6 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 non-routine.

This assessment plan was developed in October 2022 from an NTA level 6 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 clinical practice of the 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
4.1 Describe the nature and scope of management to manage organizations	4.1.1 Describe the concept of management in health facilities
	4.1.2 Describe evolution of management thoughts in health facilities
	4.1.3 Apply knowledge of organizational environment for efficient and effective management
4.2 Apply managerial functions to improve management efficiency in an organization	4.2.1 Describe the concept of planning for efficient and effective management of organizations
	4.2.2 Describe decision making process for efficient and effective management
	4.2.3 Describe the concept of organizing for efficient and effective management
	4.2.4 Describe the concept of staffing for efficient and effective management
	4.2.5 Describe the concept of directing for efficient and effective management of organizations
	4.2.6 Describe the concept of controlling for efficient and effective management of organizations
4.3 Apply contemporary management concepts for effective and efficient management of organizations	4.3.1 Describe change management in modern management
	4.3.2 Describe Customer Relationship Management (CRM) in modern management
	4.3.3 Describe the concept of employee empowerment in modern managementt
	4.3.4 Describe Management by Objectives (MBO)
	4.3.5 Describe the concept of benchmarking and business process re-engineering (BPR)

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 through 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.

4.0 Table of specification

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

S/N	Sub-enabling Outcomes and Related Task	Competence to be Assessed				74		
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams		
1.	Sub-enabling Outcome: 4.1.1 Describe the concept of management in health facilities					CA		SE
	Related Tasks:					71	11	71
						TH	OR AL	T H
	a) Define the terms; Manager, Leader, Management, Leadership and Administration	✓				✓	✓	
	b) Distinguish between manager and leader			✓		✓		✓
	c) Distinguish management from administration			✓		✓	✓	✓
	d) Describe management process					✓		✓
	e) Describe key managerial skills			✓		✓		✓
	f) Describe management levels			✓				
	g) Distinguish between modern manager and traditional manager			✓		✓	✓	✓
2.	Sub-enabling Outcome: 4.1.2 Describe evolution of management thoughts in health facilities							
	Related Tasks:							
	a) Describe pre-classical management			✓		✓		✓

S/N	Sub-enabling Outcomes and Related Task	Competence to be Assessed				74		
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams		
	b) Describe Classical approach to management			√		√		√
	c) Describe Behavioural Approach to Management			√		√		√
	d) Describe Systems Approach to Management			√		√		√
	e) Describe Contingency Approach to Management			√		√		√
3.	Sub-enabling Outcome: 4.1.3 Apply knowledge of organizational environment for efficient and effective management Related Tasks							
	a) Explain the concept of organizational/business environment			√		√	√	√
	b) Differentiate between internal and external business environment			√		√		√
	c) Apply SWOT/SWOC and PESTEL to study business environment		√			√		√
4.	Sub-enabling Outcome: 4.2.1 Describe the concept of planning for efficient and effective management of organizations Related Tasks							
	a) Define planning	√				√		
	b) Explain types of plans			√		√		√
	c) Explain characteristics of planning			√		√		√
	d) Explain importance of planning			√		√		√
	e) Describe principles of planning			√		√		√
	f) Describe the planning process			√		√		√
	g) Explain limitations of planning			√		√		√
5.	Sub-enabling Outcome: 4.2.2 Describe decision making process for efficient and effective management Related Tasks							

S/N	Sub-enabling Outcomes and Related Task	Competence to be Assessed				74	
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams	
	a) Describe decision making process			√		√	√
	b) Describe techniques of decision making			√		√	√
	c) Describe classification of decisions			√		√	√
	d) Explain challenges in decision making			√		√	√
6.	Sub-enabling Outcome: 4.2.3 Describe the concept of organizing for efficient and effective management Related Tasks						
	a) Describe the process of organizing			√		√	√
	b) Describe features of formal and informal organizations			√		√	√
	c) Explain importance of organization			√		√	√
	d) Describe principles of organizing			√		√	√
	e) Describe types of organizations (<i>military or line, functional, line and staff, matrix and hybrid organizations</i>)			√		√	√
	f) Describe the basis of departmentalization			√		√	√
	g) Explain advantages and disadvantages of centralization and decentralization			√		√	√
	h) Describe the concepts of power, authority and responsibility			√		√	√
	i) Describe the concept and principles of delegation of authority			√		√	√
7.	Sub-enabling Outcome: 4.2.4 Describe the concept of staffing for efficient and effective management Related Tasks						
	a) Describe the concept of human resources management			√		√	
	b) Describe key functions of human resources management (<i>recruitment and selection, training and development, compensation, performance appraisal, maintenance/retention, industrial/labour relations and separation</i>)			√		√	√

S/N	Sub-enabling Outcomes and Related Task	Competence to be Assessed				74		
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams		
	c) Describe the concept of grievance handling			√		√		√
	d) Describe the concept of conflict management			√		√		√
8.	Sub-enabling Outcome: 4.2.5 Describe the concept of directing for efficient and effective management of organizations Related Tasks							
	a) Explain the concepts of supervision and leadership			√		√		√
	b) Differentiate manager ship and leadership			√		√		√
	c) Explain key leadership theories (<i>Greatman theory, behavioural theories, situational/contingency theory</i>)			√		√		√
	d) Describe leadership styles (<i>Democratic, autocratic, laissez faire (free rein),</i>)			√		√		√
	e) Explain the concept of motivation			√		√		√
	f) Describe the major theories of motivation (<i>Maslow's Hierarchy of Needs Theory, Herzberg's Motivation – Hygiene Theory, McClelland's Three Needs Model and Vroom's Valence – Expectancy Theory</i>)			√		√		√
	g) Describe ways of motivating organizational members			√		√		√
9.	Sub-enabling Outcome: 4.2.6 Describe the concept of controlling for efficient and effective management of organizations Related Tasks							
	a) Explain the concept of controlling			√		√		√
	b) Describe controlling process			√		√		√
	c) Describe the relationship between controlling and planning			√		√		√
	d) Describe types of controlling			√		√		√
	e) Describe challenges in controlling			√		√		√
	f) Describe principles/guidelines of controlling			√		√		√
10.	Sub-enabling Outcome: 4.3.1 Describe change management in modern management							

S/N	Sub-enabling Outcomes and Related Task	Competence to be Assessed				74		
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams		
	Related Tasks							
	a) Describe the concept of change management			√		√		√
	b) Explain the concept of planned change			√		√	√	√
	c) Describe the process of change management			√		√		√
	d) Describe change management issues (<i>resistance to change, ways to introduce change, managing resistance to change</i>)			√		√	√	√
11.	Sub-enabling Outcome: 4.3.2 Describe Customer Relationship Management (CRM) in modern management Related Tasks							
	a) Explain the concept of Customer Relationship Management			√		√		√
	b) Describe techniques for effective CRM			√		√		√
	c) Explain benefits of CRM			√		√		√
12.	Sub-enabling Outcome: 4.3.3 Describe the concept of employee empowerment in modern management Related Tasks							
	a) Explain the concept of employee empowerment			√		√		√
	b) Describe ways to empower employees			√		√		√
	c) Explain benefits of employee empowerment			√		√		√
13.	Sub-enabling Outcome: 4.3.4 Describe Management by Objectives (MBO) Related Tasks							
	a) Explain the concept of MBO			√		√	√	√
	b) Explain benefits of MBO			√		√	√	√
	c) Explain limitations of MBO			√		√	√	√
	d) Describe ways to make MBO effective			√		√		√
14.	Sub-enabling Outcome: 4.3.5 Describe the concept of benchmarking and							

S/N	Sub-enabling Outcomes and Related Task	Competence to be Assessed				74		
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams		
	business process reengineering (BPR)							
	Related Tasks							
	a) Define benchmarking	√				√		
	b) Explain types of benchmarking			√		√	√	√
	c) Describe benchmarking process			√		√		√
	d) Explain significance of benchmarking			√		√		√
	e) Explain the concept of Business Process Reengineering and restructuring			√		√		√
	f) Describe ways to undertake BPR			√		√		√
	g) Explain significance of reengineering and restructuring			√		√		√

ASSESSMENT 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 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 (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) Assignments

- i. There shall be two written individual assignments
- ii. Assignments shall be set from competences which address wider attributes.
- iii. Note: Objective questions are NOT ALLOWED to be assessed in the assignment

c) ORAL

- 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 consist of written component only which contribute 60% of the total weight of the module.

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.

NACTEVET Reg No.....

Examination No.....

MINISTRY OF HEALTH

ORDINARY DIPLOMA (NTA LEVEL 6) IN MEDICAL LABORATORY SCIENCES

END OF SEMESTER I EXAMINATION

MODULE CODE: MLT 06104

MODULE NAME: LEADERSHIP AND MANAGEMENT

OCTOBER, 2022

TIME: 2: 30 HOURS

DATE.....

GENERAL INSTRUCTIONS:

- 1. Read all instructions carefully.**
- 2. This paper consists of FIVE (5) sections.**
- 3. Attempt all questions.**
- 4. Write your examination number on each page of the answer sheet you use.**
- 5. Each essay question to be answered on not more than 3 hand written papers**

The table below is for OFFICIAL USE ONLY

SECTION	TYPE OF QUESTIONS	ALLOCATED MARKS	SCORED MARKS	INITIAL SIGNATURE OF MARKER	INITIAL SIGNATURE OF VERIFIER
A	MULTIPLE CHOICE	20			
B	MULTIPLE TRUE/FALSE	10			
C	MATCHING ITEM	10			
D	SHORT ANSWER	30			
E	GUIDED ESSAY	30			
TOTAL		100			

Module Code and Name: MLT06105 Introduction to Diagnostic Molecular Biology

QUALIFICATION: NTA Level 6–Ordinary Diploma 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 **MLT06105 Introduction to Diagnostic Molecular Biology**

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 6 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 non-routine.

This assessment plan was developed in October 2022 from an NTA level 6 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 clinical practice of the 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.

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
2.6 Apply knowledge and skills of molecular biology in diagnosing human diseases and conditions	2.6.1 Describe nucleic acids in relation to molecular biology
	2.6.2 Describe the concept of molecular biology in diagnosis of human diseases and conditions
	2.6.3 Apply basic knowledge and skills of molecular biology in diagnosis of human diseases and conditions

HOW TO USE THIS ASSESSMENT PLAN

Each task/competence specified in the Table below will be assessed separately.

The tasks will be assessed through 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.

2.0 Table of specification

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

S/N	Sub-enabling Outcomes and Related Task	Competence to be Assessed				20		
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams		
1.	Sub-enabling Outcome: 2.6.1 Describe nucleic acids in relation to molecular biology Related Tasks:					CA		SE
						18	13	14
						TH	O R A L	TH
	a) Define the terms; (<i>Molecular biology, Gene, genomes, chromosomes, nucleosomes, Nucleic acid, DNA, RNA, cDNA, bDNA, nucleotide, nucleoside, oligonucleotide, codon, anticodon mRNA and tRNA</i>)	✓				✓		
	b) Explain Deoxyribonucleic acid (DNA) in relation to molecular biology			✓		✓	✓	
2.	c) Explain Ribonucleic acid (RNA) in relation to molecular biology			✓		✓	✓	✓
	d) Differentiate DNA and RNA structures			✓		✓	✓	✓
	Sub-enabling Outcome; 2.6.2 Describe the concept of molecular biology in diagnosis of human diseases and conditions Related Tasks:							
	a) Define the terms (<i>Polymerase Chain Reaction (PCR), primer, mutation, replication and recombinant gene,</i>	✓				✓		

S/N	Sub-enabling Outcomes and Related Task	Competence to be Assessed				20		
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams		
	<i>template, strand, open reading frame, leading strand, okazaki fragments, transcription and translation)</i>							
	b) Explain the concept of central dogma (<i>transcription and translation</i>)			√		√	√	√
	c) List enzymes involved in DNA replication (<i>DNA gyrase/topoisomerase, Helicase, DNA polymerase, DNA primase, DNA ligase, Taq polymerase</i>)	√				√		√
	d) Describe the process of DNA replication			√		√		√
	e) Outline significance of molecular diagnostic techniques			√		√	√	√
	f) Explain the recombinant gene process and its clinical utility			√		√		√
	g) Describe the process involved in nucleic acid manipulation in monitoring diseases			√		√		√
3.	Sub-enabling Outcome: 2.6.3 Apply basic knowledge and skills of molecular biology in diagnosis of human diseases and conditions Related Tasks:							
	a) Describe HIV early infant diagnosis (HEID)			√		√		√
	b) Describe Dry blood spot (DBS), plasma dried spot (DPS)			√		√		√
	c) Explain the process of receiving of DBS and DPS			√		√	√	
	d) Describe HIV viral load (HVL)			√		√	√	√
	e) Describe the role of nucleic acid testing for HIV infections diagnosis in paediatric and adult patients			√		√		√
	f) Explain types of molecular diagnostic techniques (<i>Amplification, Blotting and Hybridization</i>)			√		√	√	√
	g) Describe gel electrophoresis			√		√	√	√
	h) Extract nucleic acid in DBS and DPS according to SOP		√				√	
	i) Perform molecular diagnostic techniques as per SOPs (<i>PCR, gene expert</i>)		√				√	

ASSESSMENT 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 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 tests during CA. The written tests 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) Assignments

- i. There shall be two written individual assignments
- ii. Assignments shall be set from competences which address wider attributes.
- iii. Note: Objective questions are NOT ALLOWED to be assessed in the assignment

c) ORAL

- 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 consist of written component only which contribute 60% of the total weight of the module.

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.

NACTEVET Reg No.....

Examination No.....

MINISTRY OF HEALTH

ORDINARY DIPLOMA (NTA LEVEL 6) IN MEDICAL LABORATORY SCIENCES

END OF SEMESTER I EXAMINATION

MODULE CODE: MLT 06105

MODULE NAME: INTRODUCTION TO DIAGNOSTIC MOLECULAR BIOLOGY

OCTOBER, 2022

TIME: 2: 30 HOURS

DATE.....

GENERAL INSTRUCTIONS:

- 1. Read all instructions carefully.**
- 2. This paper consists of FIVE (5) sections.**
- 3. Attempt all questions.**
- 4. Write your examination number on each page of the answer sheet you use.**
- 5. Each essay question to be answered on not more than 3 hand written papers**

The table below is for OFFICIAL USE ONLY

SECTION	TYPE OF QUESTIONS	ALLOCATED MARKS	SCORED MARKS	INITIAL SIGNATURE OF MARKER	INITIAL SIGNATURE OF VERIFIER
A	MULTIPLE CHOICE	20			
B	MULTIPLE TRUE/FALSE	10			
C	MATCHING ITEM	10			
D	SHORT ANSWER	30			
E	GUIDED ESSAY	30			
TOTAL		100			

Module Code and Name: MLT06206 Diagnostic Parasitology and Medical Entomology

QUALIFICATION: NTA Level 6–Ordinary Diploma in Medical Laboratory Sciences

1.0. INTRODUCTION:

This assessment plan has been prepared by the Ministry of Health (MoH) under guidance of the National Council for Technical and Vocational Education and Training (NACTVET) for the module **MLT06106 Diagnostic Parasitology and Medical Entomology**

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 6 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 non-routine.

This assessment plan was developed in October 2022 from an NTA level 6 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 clinical practice of the 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
2.2 Apply knowledge and skills of parasitology and entomology in diagnosis of human diseases and conditions	2.2.1 Describe pathogenesis of diseases caused by parasites of medical importance
	2.2.2 Apply Parasitological techniques to diagnose pathological conditions
	2.2.3 Apply knowledge of Entomology in preventing parasitic infections

3 HOW TO USE THIS ASSESSMENT PLAN

Each task/competence specified in the Table below will be assessed separately.

The tasks will be assessed through 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.

5.0 Table of specification

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

S/N	Sub-enabling Outcomes and Related Task	Competence to be Assessed				32			
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams			
						CA		SE	
						25	08	21	08
						TH	PR	TH	PR
1.	Sub-enabling Outcome: 2.2.1 Describe pathogenesis of diseases caused by parasites of medical importance								
	Related Tasks:								
	a) Explain factors influencing pathogenesis of parasitic diseases (<i>host susceptibility invasiveness, dose, site of inoculation, toxins, immune evasion, host resistance</i>)			√		√			
	b) Explain pathogenesis of diseases caused by blood protozoa (<i>Malaria, Trypanosomiasis, Leishmaniasis and Toxoplasmosis</i>)			√		√		√	
	c) Explain pathogenesis of diseases caused by intestinal protozoa (<i>Giardiasis Entamoebasis, Balantidiasis and Cryptosporidiasis</i>)			√		√		√	
	d) Explain pathogenesis of diseases caused by intestinal Nematodes; (<i>Ancylostomiasis, Necatoriasis, Ascariasis, Enterobiusis,</i>			√		√		√	

	<i>Strongyloidiasis and Trichuriasis</i>								
	e) Explain pathogenesis of diseases caused by tissue Nematodes of medical importance; (<i>Wuchereriosis, Brugiassia, Onchocerciasis, Loiasis, Trichinellosis and Dracunculiasis</i>)			√		√		√	
	f) Explain pathogenesis of diseases caused by intestinal Cestodes of medical importance (<i>Taeniasis, Echinococcosis, Hymenolepiasis and Diphylobothriasis</i>)			√		√		√	
	g) Explain pathogenesis of diseases caused by Trematodes; (<i>Schistosomiasis, Paragonimiasis, Fascioliasis</i> and			√		√		√	
2.	Sub-enabling Outcome: 2.2.2 Apply Parasitological techniques to diagnose pathological conditions conditions Related Tasks								
	a) Describe urine filtration technique in quantification of <i>Schistosoma haematobium</i> ova			√		√		√	
	b) Describe Viability technique to detect <i>Schistosoma</i> miracidia			√		√		√	
	c) Describe filtration technique in quantification of <i>Schistosoma haematobium</i> ova			√		√		√	
	d) Describe Haematoxylin & eosin technique in diagnosis of <i>Trichinella</i> species			√		√		√	
	e) Describe Knott technique for diagnosis of microfilaria			√		√		√	
	f) Describe thin blood film for malaria parasites count and species identification			√		√		√	
	g) Describe faecal egg count using Kato-Katz technique for quantification of intestinal worm			√		√			
	h) Perform Viability technique to detect <i>Schistosoma</i> miracidia		√				√		√
	i) Perform filtration technique in quantification of <i>Schistosoma haematobium</i> ova		√				√		√
	j) Perform Knott technique for diagnosis of microfilaria larvae		√				√		√
	k) Prepare thin blood film for staining blood parasites		√				√		√
	l) Stain thin blood film by using Giemsa technique for malaria parasites count and species		√				√		√

	identification							
	m) Interpret and document the results			√		√		√

3.	Sub-enabling Outcome: 2.2.3 Apply knowledge of Entomology in preventing parasitic infections Related Tasks							
	a) Define the terms: <i>Entomology, Medical Entomology, Arthropod, Vector, Vertebrate, invertebrate, infestation, holoptic, dichoptic and vector control</i>	√			√			
	b) Differentiates types of vectors			√	√		√	
	c) Explain Hemimetabolous and Hollometabolous life cycle			√	√		√	
	d) Classify Arthropods and Molluscs of medical importance; taxonomy (<i>Kingdom, phylum, class, order, family, genus and species</i>) NB: All members which belongs to class Insecta, Arachnida, Crustacea and Gastropoda)			√	√		√	
	e) Explain mechanisms in which arthropods transmit parasites; (<i>Propagative disease transmission, Cyclo-propagative disease transmission, Trans ovarian/ Trans-stadial transmission, Mechanical disease transmission and Biological disease transmission</i>)			√	√		√	
	f) Explain the significance of Arthropods of medical importance			√	√		√	
	g) Explain the significance of Mollusca of medical importance			√	√		√	
	h) Explain geographical distribution, normal habitat and biology of arthropods and Mollusca of medical importance; Diptera (<i>Mosquito, Tsetse fly, House fly, black flies, blow fly, Sandfly and Crysops</i>), Siphonaptera: (<i>Fleas</i>), Anoprura; (<i>lice</i>), Hemiptera; (<i>bed bugs and Kissing bug</i>), Dictyoptera; (<i>Cockroach</i>), Gastropoda; (<i>Bulinus, Biomphalaria and Onchomelania</i>), Arachnida; Acarina; (<i>Soft tick, Hard ticks and Mites</i>).			√	√		√	
	i) Explain control measures of arthropods/Mollusca of medical importance (<i>Physical, chemical, biological, health promotion and Environmental modification</i>)			√	√		√	

j) Explain morphological characteristics of arthropods/Mollusca of medical importance: Diptera (<i>Mosquito, Tsetse fly, House fly and Blow fly</i>), Siphonaptera: (<i>Fleas</i>), Anoprura; (<i>lice</i>), Hemiptera; (<i>bed bugs</i>), Dictyoptera; (<i>Cockroach</i>), Gastropoda; (<i>Bulinus, Biomphalaria and Onchomelania</i>), Arachnida; Acarina; (<i>Soft tick and Hard ticks</i>)			√		√		√	
k) Identify arthropods of medical importance: Diptera (<i>Mosquito, Tsetse fly, House fly and Blow fly</i>), Siphonaptera: (<i>Fleas</i>), Anoprura; (<i>lice</i>), Hemiptera; (<i>bed bugs</i>), Dictyoptera; (<i>Cockroach</i>), Gastropoda; (<i>Bulinus, Biomphalaria and Onchomelania</i>), Arachnida; Acarina; (<i>Soft tick and Hard ticks</i>)	√					√		√
l) Identify Mollusca of medical importance: (<i>Bulinus, Bulinus, Onchomelania, Biomphalaria and Lymnaea</i>)	√					√		√

ASSESSMENT 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;

- Assignments shall contribute 5% of the total weight
- Written tests shall contribute 10% of the total weight
- Practical shall contribute 25% 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

- vi. 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)
- vii. 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)
- viii. 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)
- ix. Section D shall comprise of six (6) Short Answer Questions with a total of 30 marks (score for each question shall be 5 marks)
- x. 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 assignments

c) Practical test

- i. Examination questions shall be set from tasks which addresses skills and wider attributes.
- ii. The practical examination shall consist of four (4) questions, with 25 marks each.
(Questions should be set from the following areas; Entomology, Stool, Urine and Blood including body fluids). Each area should be represented by one question.
- iii. Part of entomology shall consist of five spot question.
- iv. Each spot question shall have two accompanied questions which shall be based on identification of the respective spot

4.2 Semester Examination

4.2.1 Module weight

The semester examination shall consist of written and practical component which contributes 60% of the total weight of the module.

- a) Written examination shall contribute 20% of module weight
- b) Practical examination shall contribute 40% of module weight

4.2.2 Number of questions, marks distributions and sections

a) Written examination

There shall be minimum of two written tests during CA. The continuous written tests 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. Examination questions shall be set from tasks which addresses skills and wider attributes.
- ii. The practical examination shall consist of four (4) questions, with 25 marks each.
(Questions should be set from the following areas; Entomology, Stool, Urine and Blood including body fluids). Each area should be represented by one question
- iii. Part of entomology shall consist of five spot question.

- iv. Each spot question shall have two accompanied questions which shall be based on identification of the respective spot

4.2.3 Duration of assessments

- i. The duration of written examination shall be two and half (2½) hours
- ii. The duration of practical examination shall be three (3) hours

NACTEVET Reg No.....

Examination No.....

MINISTRY OF HEALTH

ORDINARY DIPLOMA (NTA LEVEL 6) IN MEDICAL LABORATORY SCIENCES

END OF SEMESTER I EXAMINATION

MODULE CODE: MLT 06206

**MODULE NAME: DIAGNOSTIC PARASITOLOGY AND MEDICAL
ENTOMOLOGY**

OCTOBER, 2022

TIME: 2: 30 HOURS

DATE.....

GENERAL INSTRUCTIONS:

- 1. Read all instructions carefully.**
- 2. This paper consists of FIVE (5) sections.**
- 3. Attempt all questions.**
- 4. Write your examination number on each page of the answer sheet you use.**
- 5. Each essay question to be answered on not more than 3 hand written papers**

The table below is for OFFICIAL USE ONLY

SECTION	TYPE OF QUESTIONS	ALLOCATED MARKS	SCORED MARKS	INITIAL SIGNATURE OF MARKER	INITIAL SIGNATURE OF VERIFIER
A	MULTIPLE CHOICE	20			
B	MULTIPLE TRUE/FALSE	10			
C	MATCHING ITEM	10			
D	SHORT ANSWER	30			
E	GUIDED ESSAY	30			
TOTAL		100			

Module Code and Name: MLT06207 Diagnostic Microbiology and Immunology

QUALIFICATION: NTA Level 6–Ordinary Diploma 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 **MLT06107 Diagnostic 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 6 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 non-routine.

This assessment plan was developed in October 2022 from an NTA level 6 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 clinical practice of the 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 Table below shows enabling outcomes and Sub-enabling of the module.

Enabling Outcomes	Sub-Enabling Outcomes
2.1 Apply knowledge and skills of microbiology and immunology in diagnosis of human diseases and conditions	2.1.1 Describe pathogenesis of diseases caused by microorganisms
	2.1.2 Describe concepts of immunology in disease diagnosis
	2.1.3 Apply knowledge and skills of pathology in performing microbiological tests
	2.1.4 Apply knowledge and skills of culture media preparation in diagnosing human diseases

	2.1.5 Describe concepts of antimicrobial agents in managing human diseases
	2.1.6 Apply knowledge and skills of microbial isolation and susceptibility testing to diagnose human 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 through 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.

4.0 Table of specification

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

S/N	Sub-enabling Outcomes and Related Task	Competence to be Assessed				44			
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams			
						CA		SE	
1.	Sub-enabling Outcome:					28	16	2	14
	2.1.1 Describe pathogenesis of diseases caused by microorganisms							5	
	Related Tasks:					T	PR	T	PR
	a) Explain factors influencing disease pathogenesis (virulent factors; toxins, capsule, cell wall, adhesins and Host resistance)			√		√		√	
	b) Explain pathogenesis of diseases caused by cocci bacteria of medical importance (<i>Staphylococcus aureus</i> , <i>Streptococcus pyogenes</i> , <i>Streptococcus pneumonia</i> , <i>Neisseria gonorrhoea</i> and <i>Neisseria meningitidis</i>)			√		√		√	
	c) Explain pathogenesis of diseases caused by bacilli bacteria of medical importance (<i>Bacillus anthracis</i> , <i>Clostridium tetani</i> , <i>Clostridium botulinum</i> , <i>Corynebacterium diphtheriae</i> , <i>Yersinia pestis</i> , <i>Chlamydia trachomatis</i> , <i>Haemophilus influenzae</i> , <i>Haemophilus ducreyi</i> , <i>Escherichia coli</i> , <i>Salmonellae typhi</i> , <i>Shigella dysenteriae</i> , <i>Brucella abortus</i> , <i>Vibrio cholerae</i> and <i>Helicobacter pylori</i>)			√		√		√	

	d) Explain pathogenesis of diseases caused by other bacteria of medical importance (<i>Mycobacterium tuberculosis</i> , <i>Mycobacterium leprae</i> , <i>Treponema pallidum</i> , <i>Borrelia recurrentis</i> and <i>Borrelia duttoni</i>)			√		√		√	
	e) Describe mechanisms by which fungi cause diseases (toxins, virulent factors and Host factors)			√		√		√	
	f) Explain pathogenesis of diseases caused by fungi of medical importance (<i>Candida albicans</i> and <i>Cryptococcus neoformans</i>)			√		√		√	
	g) Describe mechanisms by which viruses cause diseases (e.g., toxins and virulent factors)			√		√		√	
	h) Explain pathogenesis of diseases caused by viruses of medical importance (<i>HIV</i> , <i>hepatitis B & C</i> , <i>Yellow fever</i> , <i>Ebola</i> , <i>Polio</i> , <i>Rabies</i> , <i>HSV I & II</i> , <i>HPV</i> and <i>corona virus</i>)			√		√		√	
2.	Sub-enabling Outcome: 2.1.2 Describe concepts of immunology in disease diagnosis Related Tasks:								
	a) Define terms; Cytolysis, Cytotoxic T cell, B cell (B lymphocyte), Endotoxins, Exotoxins, Epitope, Hapten, Immunity, Antigen presenting cells, Natural killer (NK) cells, Cell-mediated (cellular) immunity, Humoral immunity, Hypersensitivity reactions, Macrophage, Opsonin, Opsonization, Polymorphonuclear cell (PMN), Plasma cell, Phagocytic Cells, Phagocytosis, Immune organs and immune tissues, vaccine, toxoid and auto-immunity	√				√		√	
	b) Explain phagocytosis mechanisms in combating infection			√		√		√	
	c) Describe factors affecting phagocytosis (e.g characteristics of the phagocytic cells, characteristics of the pathogen, nature of other accessory molecules and opsonins available, species-specific mechanisms by which phagocytes kill microorganisms)			√		√		√	
	d) Explain the humoral immunity			√		√		√	
	e) Explain the cell mediated immunity			√		√		√	
	f) Explain types of Hypersensitivity reactions			√		√		√	

	g) Explain agglutination Reactions (<i>Indirect hemagglutination and Hemagglutination inhibition test</i>)			√		√		√	
	h) Describe confirmatory test for syphilis (<i>Treponema pallidum haemagglutination assay and Fluorescent treponemal antibody absorption test</i>)			√		√		√	
3.	Sub-enabling Outcome: 2.1.3 Apply knowledge and skills of pathology in performing microbiological tests Related Tasks:								
	a) Describe specific microbiological techniques (<i>Auramine, Rhodamine, Rheumatoid factor, Hepatitis B& C, Extended Widal test, C-reactive protein, Cryptococcus-antigen Latex test and ELISA</i>)			√		√		√	
	b) Perform Auramine staining technique as per SOP, interpret and comment results		√				√		√
	c) Perform Rhodamine staining technique as per SOP, interpret and comment results		√				√		√
	d) Perform TPHA test for confirmation syphilis infection as per SOP, interpret and comment results		√				√		√
	e) Perform Rheumatoid factor identification test as per SOP, interpret and comment results		√				√		√
	f) Perform Hepatitis B & C identification tests as per SOP, interpret and comment results		√				√		√
	g) Perform Extended Widal test as per SOP, interpret and comment results		√				√		√
	h) Perform microbiological test to identify C-reactive protein as per SOP, interpret and comment results		√				√		√
	i) Perform cryptococcal antigen latex test to identify as per SOP, interpret and comment results		√				√		√
4.	Sub-enabling Outcome: 2.1.4 Apply knowledge and skills of culture media preparation in diagnosis of diseases Related Tasks:								

	a) Define terms; Culture, Culture media, broth culture media, selective, differential/indicator, enrichment, enriched and sensitivity media)	√				√			
	b) Describe different types of culture media (<i>General, Selective, differential, enrichment, enriched, Transport media and sensitivity media</i>)			√		√		√	
	c) Describe preparation of different culture media; required materials and calculation			√		√		√	
	d) Describe quality of culture media			√		√		√	
	e) Describe storage of culture media			√		√		√	
	f) Prepare culture media according to SOPs (<i>e.g., general purpose, Selective, differential, enrichment, enriched, Transport media and sensitivity media</i>)		√				√		
	g) Perform quality control and verification of prepared culture media according to SOPs		√				√		
5.	Sub-enabling Outcome: 2.1.5 Describe concepts of antimicrobial agents in managing human diseases Related Tasks:								
	a) Define the terms; sensitive, resistance, inhibition, zone of inhibition, intermediate, antimicrobial discs	√				√			
	b) Explain antimicrobial minimum inhibition concentration			√		√		√	
	c) Classify antimicrobial agents (<i>Spectrum of activity, Effect on bacteria and mode of action</i>) as guidelines			√		√		√	
6.	Sub-enabling Outcome: 2.1.6 Apply knowledge and skills of microbial isolation and susceptibility testing to diagnose human diseases Related Tasks:								
	a) Define terms: <i>inoculation, colony, culture growth, isolate, biochemical test, subculture, susceptibility test, inoculum and colony forming unit</i>	√				√			
	b) Explain methods of susceptibility tests (<i>Kirby Bauer and Stokes</i>)			√		√		√	
	c) Explain importance of antimicrobial susceptibility testing			√		√		√	
	d) Inoculate sample on different types of culture media depending on nature of specimen		√				√		√

e)	Perform subculture from isolates		√				√		√
f)	Perform biochemical tests from isolated colonies		√				√		√
g)	Interpret biochemical test results			√			√		√
h)	Perform antimicrobial susceptibility tests		√				√		√
i)	Interpret susceptibility test results and document			√			√		√

ASSESSMENT 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;

- Assignments shall contribute 5% of the total weight
- Written tests shall contribute 10% of the total weight
- Practical shall contribute 25% 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 tests during CA. The continuous tests 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) 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 assignments

c) Practical test

- i. Examination questions shall be set from tasks which addresses skills and wider attributes.
- ii. The practical examination shall consist of four (4) questions, with 25 marks each which shall be set from different learning task.

4.2 Semester Examination

4.2.1 Module weight

The semester examination shall consist of written and practical component which contributes 60% of the total weight of the module.

- a) Written examination shall contribute 20% of module weight
- b) Practical examination shall contribute 40% of module weight

4.2.2 Number of questions, marks distributions and sections

a) Written examination

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 (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. Examination questions shall be set from tasks which addresses skills and wider attributes.
- ii. The practical examination shall consist of four (4) questions, with 25 marks each which shall be set from different learning task.

4.2.3 Duration of assessments

- iii. The duration of written examination shall be two and half (2½) hours
The duration of practical examination shall be three (3) hours

NACTEVET Reg No.....

Examination No.....

MINISTRY OF HEALTH

ORDINARY DIPLOMA (NTA LEVEL 6) IN MEDICAL LABORATORY SCIENCES

END OF SEMESTER I EXAMINATION

MODULE CODE: MLT 06207

MODULE NAME: DIAGNOSTIC MICROBIOLOGY AND IMMUNOLOGY

OCTOBER, 2022

TIME: 2: 30 HOURS

DATE.....

GENERAL INSTRUCTIONS:

16. Read all instructions carefully.

17. This paper consists of FIVE (5) sections.

18. Attempt all questions.

19. Write your examination number on each page of the answer sheet you use.

20. Each essay question to be answered on not more than 3 hand written papers

The table below is for OFFICIAL USE ONLY

SECTION	TYPE OF QUESTIONS	ALLOCATED MARKS	SCORED MARKS	INITIAL SIGNATURE OF MARKER	INITIAL SIGNATURE OF VERIFIER
A	MULTIPLE CHOICE	20			
B	MULTIPLE TRUE/FALSE	10			
C	MATCHING ITEM	10			
D	SHORT ANSWER	30			
E	GUIDED ESSAY	30			
TOTAL		100			

Module Code and Name: MLT06208 Diagnostic Clinical Chemistry.

QUALIFICATION: NTA Level 6–Ordinary Diploma 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 **MLT06108 Diagnostic 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 6 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 non-routine.

This assessment plan was developed in October 2022 from an NTA level 6 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 clinical practice of the 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 Table below shows enabling outcomes and Sub-enabling of the module.

Enabling Outcomes	Sub-Enabling Outcomes
2.4 Apply knowledge and skills of clinical chemistry in diagnosing human diseases and conditions	2.4.1 Describe the concepts of metabolic disorders in clinical chemistry practices
	2.4.2 Apply knowledge and skills of metabolic disorders in clinical chemistry to diagnose human diseases
	2.4.3 Describe concepts of pathology in identification of biological markers in clinical chemistry practices

3. HOW TO USE THIS ASSESSMENT PLAN

Each task/competence specified in the Table below will be assessed separately.

The tasks will be assessed through 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.

4.0. Table of specification

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

S/N	Sub-enabling Outcomes and Related Task	Competence to be Assessed				43			
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams			
						CA		SE	
1.	Sub-enabling Outcome:					32	10	31	10
	2.4.1 Describe the concepts of metabolic disorders in clinical chemistry practices								
	Related Tasks:					T	PR	T	PR
	a) Explain pathophysiology of glucose metabolic disorder (<i>Diabetes Mellitus</i>)			√		√		√	
	b) Explain pathophysiology of acid-base imbalance (<i>Acidosis and alkalosis</i>)			√		√		√	
	c) Explain pathophysiology of lipid metabolic disorders (<i>Hyperlipidaemia and hypolipidemia. hypercholesterolemia and hypocholesterolemia</i>)			√		√		√	
	d) Explain pathophysiology of mineral metabolic disorders (<i>hypercalcemia, hypocalcemia, hyperphosphatemia and hypophosphatemia</i>)			√		√		√	
	e) Explain pathophysiology of non-protein nitrogenous compound metabolic disorders (<i>azotemia, gout, hyperuricemia and hypouricemia</i>)			√		√		√	
	f) Explain pathophysiology of protein metabolic disorders (<i>nephrotic syndrome, cirrhosis, multiple myeloma and kwashiakor</i>)			√		√		√	

	g) Explain pathophysiology of electrolyte imbalance (<i>Hyperkalemi, hypokalemia, hypo- and hyper-natremia</i>)			√		√		√	
	h) Explain pathophysiology of metabolic disorders of the liver(<i>jaundice, cirrhosis, hepatitis Gilbert disease, Crigglar najar syndrome and Dubbin–Johnson syndrome</i>)			√		√		√	
2.	Sub-enabling Outcome; 2.4.2 Apply knowledge and skills of metabolic disorders in clinical chemistry to diagnose human diseases Related Tasks:								
	a) Explain significance of glycosylated haemoglobin in diagnosis of diabetes mellitus			√		√		√	
	b) Explain significance of glucose tolerance in diagnosis of diabetes mellitus			√		√		√	
	c) Explain principle of Glycosylated haemoglobin tests			√		√		√	
	d) Explain principle of Oral glucose tolerance test			√		√		√	
	e) Explain principle of urea determination method (<i>enzymatic method</i>)			√		√		√	
	f) Explain principle of creatinine determination method			√		√		√	
	g) Explain principle of uric acid determination method (<i>enzymatic method</i>)			√		√		√	
	h) Explain clinical significance of creatinine clearance			√		√		√	
	i) Explain clinical significance of non-protein nitrogenous compound (<i>urea, uric acid and creatinine</i>)			√		√		√	
	j) Explain principle of Calcium and phosphorus determination method			√		√		√	
	k) Explain the principle of ion selective electrode (ISE) method for electrolytes determination			√		√		√	
	l) Explain clinical significance of measuring individual proteins (<i>Albumin, Ceruloplasmin, Transferrin and Ferritin</i>)			√		√		√	

	m) Explain clinical significance of total iron binding capacity			√		√		√	
	n) Explain principle of protein electrophoresis			√		√		√	
	o) Perform Oral glucose tolerance test		√				√		√
	p) Perform urea test in plasma/ serum/urine as per SOP		√				√		√
	q) Perform creatinine test in plasma/serum/urine as per SOP		√				√		√
	r) Perform uric acid test in plasma/serum as per SOP		√				√		√
	s) Perform creatinine clearance test based on weight, height, body surface area and urine volume as per SOP		√				√		√
	t) Perform bilirubin test in serum/plasma as per SOP		√				√		√
	u) Perform Calcium test in Serum/Plasma/ Urine as per SOP		√				√		√
	v) Perform Phosphorus test in Serum/Plasma/ Urine as per SOP		√				√		√
	w) Perform albumin test in blood as per SOP		√				√		√
	x) Perform lipid profile test (<i>total cholesterol, Triglyceride and lipoprotein (HDL and LDL)</i>) as per SOP		√				√		√
3.	Sub-enabling Outcome: 2.4.3 Describe concepts of pathology in identification of biological markers in clinical chemistry practices Related Tasks:								
	a) Define terms (<i>enzymology, Enzyme, Apo-enzyme, holo-enzyme, co-enzyme, prosthetic, iso-enzyme, co-factor, group allosteric inhibitors and pro-enzyme</i>)	√				√			
	b) Explain enzyme kinetics			√		√		√	
	c) Explain enzyme inhibitors (<i>competitive, non-competitive, un competitive and allosteric</i>)			√		√		√	
	d) Explain liver enzyme/isoforms markers (<i>ALAT, ASAT, ALP and GGT</i>)			√		√		√	
	e) Explain cardiac enzyme/isoforms markers (<i>CPK, LDH and ASAT</i>)			√		√		√	

f)	Explain pancreatic enzyme markers (<i>Amylase and Lipase</i>)			√		√		√	
g)	Explain cardiac protein markers (<i>troponin</i> and <i>myoglobin</i>)			√		√		√	
h)	Explain tumor markers (<i>PSA, Alpha fetoprotein, CEA, Calcitonin and HCG</i>)			√		√		√	
i)	Explain thyroid hormonal markers (<i>T3, T4 and TSH</i>)			√		√		√	
j)	Explain infertility hormonal markers (<i>FSH, LH, progesterone, oestrogen, testosterone and prolactin</i>)			√		√		√	

ASSESSMENT 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) Assignments shall contribute 5% of the total weight
- b) Written tests shall contribute 10% of the total weight
- c) Practical shall contribute 25% 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 (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) 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 assignments

c) Practical test

- i. Examination questions shall be set from tasks which addresses skills and wider attributes.
- ii. The practical examination shall consist of four (4) questions, with 25 marks each which shall be set from different learning task.

4.2 Semester Examination

4.2.1 Module weight

The semester examination shall consist of written and practical component which contributes 60% of the total weight of the module.

- a) Written examination shall contribute 20% of module weight
- b) Practical examination shall contribute 40% of module weight

4.2.2 Number of questions, marks distributions and sections

a) Written examination

There shall be minimum of two written tests. The written tests 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. Examination questions shall be set from tasks which addresses skills and wider attributes.
- ii. The practical examination shall consist of four (4) questions, with 25 marks each which shall be set from different learning task.

4.2.3 Duration of assessments

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

The duration of practical examination shall be three (3) hours

NACTEVET Reg No.....

Examination No.....

MINISTRY OF HEALTH

ORDINARY DIPLOMA (NTA LEVEL 6) IN MEDICAL LABORATORY SCIENCES

END OF SEMESTER I EXAMINATION

MODULE CODE: MLT 06208

MODULE NAME: DIAGNOSTIC CLINICAL CHEMISTRY

OCTOBER, 2022

TIME: 2: 30 HOURS

DATE.....

GENERAL INSTRUCTIONS:

21. Read all instructions carefully.

22. This paper consists of FIVE (5) sections.

23. Attempt all questions.

24. Write your examination number on each page of the answer sheet you use.

25. Each essay question to be answered on not more than 3 hand written papers

The table below is for OFFICIAL USE ONLY

SECTION	TYPE OF QUESTIONS	ALLOCATED MARKS	SCORED MARKS	INITIAL SIGNATURE OF MARKER	INITIAL SIGNATURE OF VERIFIER
A	MULTIPLE CHOICE	20			
B	MULTIPLE TRUE/FALSE	10			
C	MATCHING ITEM	10			
D	SHORT ANSWER	30			
E	GUIDED ESSAY	30			
TOTAL		100			

Module Code and Name: MLT06209 Diagnostic Histology and Cytology.

QUALIFICATION: NTA Level 6 – Ordinary Diploma 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 **MLT06109 Diagnostic Histology and Cytology**

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 6 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 non-routine.

This assessment plan was developed in October 2022 from an NTA level 6 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 clinical practice of the 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 Table below shows enabling outcomes and Sub-enabling of the module.

Enabling Outcomes	Sub-Enabling Outcomes
2.5 Apply knowledge and skills of histology and cytology in diagnosing human diseases and conditions	2.5.1 Describe the concept of histopathology in diagnosing human diseases
	2.5.2 Describe the concepts of cytopathology in diagnosing human diseases
	2.5.3 Apply histological techniques in disease diagnosis
	2.5.4 Apply cytopathological techniques in disease diagnosis

	2.5.5 Apply knowledge of histology and cytology in forensic investigations
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3 HOW TO USE THIS ASSESSMENT PLAN

Each task/competence specified in the Table below will be assessed separately.

The tasks will be assessed through 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.

4 Table of specification

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

S/N	Sub-enabling Outcomes and Related Task	Competence to be Assessed				40			
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams			
						CA		SE	
1.	Sub-enabling Outcome: 2.5.1 Describe the concept of histopathology in diagnosing human diseases					23	15	20	12
	Related Tasks:					T H	P R	T H	PR
	a) Define terms; <i>histopathology, autopsy, biopsy pathology and pathogenesis</i>	√				√			
	b) List types of biopsies based on diagnosis (<i>incisional, excisional and curetting</i>)	√				√		√	
	c) Explain inflammatory conditions associated with TB, Leprosy, Schistosomiasis, Trichinellosis, and Crohn's diseases diagnosed through histopathological methods			√		√		√	
	d) List histopathological staining techniques (<i>H&E, ZN stain, Gram's stain, Giemsa stain, Periodic acid Schiff and Alcian blue</i>)	√				√		√	
2.	Sub-enabling Outcome; 2.5.2 Describe the concepts of cytopathology in diagnosing human diseases								

	Related Tasks:								
	a) Define the terms; (<i>semen, azoospermia, aspermia, oligospermia, teratospermia, necrospermia, cytopathology, neoplasia, dysplasia, hyperplasia, karyotyping, sex anomaly and aplasia</i>).	√				√			
	b) Explain macroscopic and microscopic semen analysis (<i>volume, viscosity, color, odor, pH, Liquifaction, motility, concentration and viability</i>)			√		√		√	
	c) Explain cytological staining techniques (<i>PAP and H&E</i>)			√		√		√	
	d) Explain types of exudates and effusions			√		√		√	
	e) Explain macroscopic and microscopic analysis of effusions and exudate			√		√		√	
	f) Explain the principle of cytological smear staining techniques according to SOP (<i>Gram stain, ZN stain and Giemsa and PAP smear</i>)			√		√		√	
	g) Explain diseases diagnosed through cytopathological techniques (<i>neoplastic, microbial infections</i>)			√		√		√	
	h) Outline conditions diagnosed through cytopathological techniques (<i>male infertility inflammatory conditions and sex anomalies - {androgenous, epicene, gynandromorphilia, transgender and intersex conditions}</i>)	√				√		√	
3.	Sub-enabling Outcome: 2.5.3 Apply histological techniques in disease diagnosis Related Tasks:								
	a) Describe routine Histopathological stain (<i>Haematoxylin and Eosin stains</i>)			√					
	b) Describe special Histopathological stains (<i>ZN stain, Gram's stain, Giemsa stain, Periodic acid Schiff and Alcian blue</i>)			√		√		√	
	c) Perform Tissue processing as per SOPs (<i>secondary fixation, dehydration, clearing and infiltration</i>)		√				√		
	d) Perform tissue embedding as per SOP		√				√		

	e) Perform Haematoxylin and Eosin staining technique as per SOP		√				√		√
	f) Perform ZN staining technique as per SOP		√				√		√
	g) Perform Gram's staining technique as per SOP		√				√		√
	h) Perform Giemsa staining technique as per SOP		√				√		√
	i) Perform periodic acid Schiff (PAS) staining technique as per SOP		√				√		√
	j) Perform Alcian blue staining technique as per SOP		√				√		√
	k) Perform mounting and as per SOP		√				√		√
	l) Interpret staining reactions as per SOP.			√			√		√
4	Sub-enabling Outcome: 2.5.4 Apply cytopathological techniques in disease diagnosis Related Tasks:								
	2.0. Explain exfoliative cytology			√		√		√	
	2.1. Explain morphological features of spermatozoa			√		√		√	
	2.2. Explain reasons for performing seminal analysis (<i>infertility, successfulness vasectomy, artificial insemination purposes, medical legal issues and study purposes</i>)			√		√		√	
	2.3. Explain factors to consider during collection of quality seminal fluid specimen (<i>abstain from coitus 3 - 5 days, avoid use of lubricant with chemicals, avoid use of condoms with chemicals, privacy environment, use chemical free container, note time of collection, avoid alcohol intake, specimen timely delivery and maintain body temperature</i>)			√		√		√	
	2.4. Explain factors affecting seminal fluid results			√		√		√	
	2.5. Explain methods used in collection of seminal fluid (<i>coitus interruptus, masturbation, prostatic massage, cauda epididymis collection and electro-ejaculation</i>)			√		√		√	

	2.6. Explain limitations of performing seminal analysis (<i>late delivery, late testing, incompetent personnel and inaccessible testing facility</i>)			√		√		√	
	2.7. Perform macroscopic analysis of seminal fluid (<i>volume, colour, viscosity, liquefaction, pH and fructose</i>) according to SOP		√				√		√
	2.8. Perform microscopic analysis of seminal fluid according to SOP (<i>motility, morphology, concentration, viability</i>)		√				√		√
	2.9. Prepare cytological smears for staining as per SOP (<i>seminal fluid, aspirates, urine, sputum and CSF</i>)		√				√		√
	2.10. Perform macroscopic and microscopic analysis of exudates and effusions (<i>Purulent, color, odor and smear examination</i>)		√				√		√
	2.11. Stain smear using appropriate stains and check quality of staining (<i>Papanicolau stain, ZN stain, Giemsa stain and gram stain</i>) as per SOP		√				√		√
5	Sub-enabling Outcome: 2.5.5 Apply knowledge of histology and cytology in forensic investigations Related Tasks:								
	a) Define; forensic science, forensic investigation	√				√			
	b) Explain types of forensic analysis (Physical Matching, Fingerprint Matching, Hair and fibre analysis, Ballistic Analysis, Blood Spatter Analysis, DNA Analysis and Forensic Pathology)			√		√		√	
	c) List types of forensic specimens (e.g. blood, blood spatter, hair, nail, body organs, urine, etc) Explain the importance of forensic science	√				√		√	

ASSESSMENT 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) Assignments shall contribute 5% of the total weight
- b) Written tests shall contribute 10% of the total weight
- c) Practical shall contribute 25% 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 tests. The written tests 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) 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 assignments

c) Practical test

- i. Examination questions shall be set from tasks which addresses skills and wider attributes.
- ii. The practical examination shall consist of four (4) questions, with 25 marks each which shall be set from different learning task.

4.2 Semester Examination

4.2.1 Module weight

The semester examination shall consist of written and practical component which contributes 60% of the total weight of the module.

- a) Written examination shall contribute 20% of module weight
- b) Practical examination shall contribute 40% of module weight

4.2.2 Number of questions, marks distributions and sections

a) Written examination

There shall be minimum of two written tests. The written tests 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. Examination questions shall be set from tasks which addresses skills and wider attributes.
- ii. The practical examination shall consist of four (4) questions, with 25 marks each which shall be set from different learning task.

4.2.3 Duration of assessments

- i. The duration of written examination shall be two and half (2½) hours
- The duration of practical examination shall be three (3) hours

NACTEVET Reg No.....

Examination No.....

MINISTRY OF HEALTH

ORDINARY DIPLOMA (NTA LEVEL 6) IN MEDICAL LABORATORY SCIENCES

END OF SEMESTER I EXAMINATION

MODULE CODE: MLT 06209

MODULE NAME: DIAGNOSTIC HISTOLOGY AND CYTOLOGY

OCTOBER, 2022

TIME: 2: 30 HOURS

DATE.....

GENERAL INSTRUCTIONS:

26. Read all instructions carefully.

27. This paper consists of FIVE (5) sections.

28. Attempt all questions.

29. Write your examination number on each page of the answer sheet you use.

30. Each essay question to be answered on not more than 3 hand written papers

The table below is for OFFICIAL USE ONLY

SECTION	TYPE OF QUESTIONS	ALLOCATED MARKS	SCORED MARKS	INITIAL SIGNATURE OF MARKER	INITIAL SIGNATURE OF VERIFIER
A	MULTIPLE CHOICE	20			
B	MULTIPLE TRUE/FALSE	10			
C	MATCHING ITEM	10			
D	SHORT ANSWER	30			
E	GUIDED ESSAY	30			
TOTAL		100			

Module Code and Name: MLT06210 Diagnostic Hematology and Blood Transfusion.

QUALIFICATION: NTA Level 6 – Ordinary Diploma 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 **MLT0610 Diagnostic 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 6 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 non-routine.

This assessment plan was developed in October 2022 from an NTA level 6 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 clinical practice of the 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 Table below shows enabling outcomes and Sub-enabling of the module.

Enabling Outcomes	Sub-Enabling Outcomes
2.3 Apply knowledge and skills of haematology and immunohaematology in diagnosing and managing human disorders	2.3.1 Describe pathogenesis of haematological disorders in diagnosing human disease
	2.3.2 Describe haematological techniques in diagnosing human disease
	2.3.3 Apply skills of haematology in diagnosing human diseases
	2.3.4 Describe the concept of immunohaematology in blood banking
	2.3.5 Apply knowledge and skills of immunohaematology in performing blood transfusion tests
	2.3.6 Apply knowledge and skills of immunohaematology in preparing blood products for transfusion purposes

3 HOW TO USE THIS ASSESSMENT PLAN

Each task/competence specified in the Table below will be assessed separately.

The tasks will be assessed through 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.

4 Table of specification

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

S/ N	Sub-enabling Outcomes and Related Task	Competence to be Assessed				40			
		Knowledge	Skills	Understanding	Wider attributes	No. of tasks provided under Continuous Assessment and Semester Exams			
						CA		SE	
1.	Sub-enabling Outcome: 2.3.1 Describe pathogenesis of haematological disorders in diagnosing human disease					23	16	21	17
	Related Tasks:					T H	P R	T H	PR
	a) Describe haemostasis (<i>mechanism of action of vascular system, thrombocytes, clotting factors and fibrinolysis</i>)			✓		✓		✓	
	b) Describe coagulation pathways			✓		✓		✓	
	c) Describe red blood cells indices			✓		✓		✓	
	d) Describe haemoglobinopathies			✓		✓		✓	
	e) Describe etiology, classification and significance of anaemia			✓		✓		✓	
	f) Describe the aetiology, pathophysiology and laboratory diagnosis of leukaemia			✓		✓		✓	
	g) Explain the significance of CD4+ T-cells in relation to immune mechanism			✓		✓		✓	
2.	Sub-enabling Outcome; 2.3.2 Describe haematological techniques in diagnosis of human disease Related Tasks:								

	a) Explain special stains used in the diagnosis of leukaemia			√		√		√	
	b) Describe staining pattern in leukaemia to establish disease states			√		√		√	
	c) Explain the principle of haematological tests (<i>Hb electrophoresis, Osmotic fragility, Bleeding time, Clotting time, Prothrombin time, Partial Thromboplastin time, Reticulocyte count, Eosinophil count, G6PD, CD4/CD8 count, FBP/CBC and thin blood film staining techniques</i>)			√		√		√	
	d) Describe haematological laboratory tests (<i>Hb electrophoresis, Osmotic fragility, Bleeding time, Clotting time, Prothrombin time, Partial Thromboplastin time, Reticulocyte count, Eosinophil count, G6PD, CD4/CD8 count, FBP/CBC and thin blood film staining technique by leishman stain and haemolysin test</i>)			√		√		√	
3.	Sub-enabling Outcome: 2.3.3 Apply skills of haematology in diagnosing human diseases Related Tasks:								
	a) Perform white blood cells differential count, Interpret, and comment on results		√				√		√
	b) Perform total white blood cell count using Turk's solution, Interpret, and comment on results		√				√		√
	c) Stain thin blood film to identify normal RBC morphology, Interpret, and comment on results		√				√		√
	d) Perform Bleeding time test, Interpret, and comment on results		√				√		√
	e) Perform clotting time test, Interpret, and comment on results		√				√		√
	f) Perform Prothrombin time, Interpret, and comment on results		√				√		√
	g) Perform Activated partial thromboplastin time, Interpret, and comment on results		√				√		√
	h) Perform Reticulocyte, Interpret, and comment on results		√				√		√
	i) Perform Methaemoglobin reduction test (<i>G6PD</i>), Interpret, and comment on results		√				√		√

	j) Perform thin blood film for blood cells count, Interpret, and comment on results		√				√		√
	k) Perform Eosinophil count, Interpret, and comment on results		√				√		√
4	Sub-enabling Outcome: 2.3.4 Describe the concept of immunohaematology in blood banking Related Tasks:								
	a) Describe ABO and Rh blood group disorders			√		√		√	
	b) Explain subgroup of ABO			√		√		√	
	c) Explain other blood group systems of clinical								
	d) significance (<i>MN, P, Lutheran, Kell, Duffy, Kid and Lewis</i>)			√		√		√	
	e) Describe Coomb's test (<i>Direct and Indirect</i>)			√		√		√	
	f) Explain factors that may entail need of blood for transfusion (e.g., <i>operation, accident and deficiency of blood components</i>)			√		√		√	
	g) Explain factors which cause false positive agglutination in blood transfusion practice.			√		√		√	
5	Sub-enabling Outcome: 2.3.5 Apply knowledge and skills of immunohaematology in performing blood transfusion tests Related Tasks:								
	a) Explain the clinical significance of Direct and Indirect Coomb's Test			√		√		√	
	b) Identify the requirements for performing Direct and Indirect Coomb's Test, Interpret, and comment on results	√					√		√
	c) Use knowledge and skills of immunohaematology to Perform Direct Coomb's Test, Interpret, and comment on results		√				√		√
	d) Use knowledge and skills of immunohaematology to Perform Indirect Coomb's Test, Interpret, and comment on results		√				√		√
6.	Sub-enabling Outcome: 2.3.6 Apply knowledge and skills of immunohaematology in preparing blood products for transfusion purposes Related Tasks:								

a) Define terms; immunohaematology, Packed cells, fresh	√				√			
b) Plasma, fresh frozen plasma, platelets concentrate, cryoprecipitate and red blood cells sensitization	√				√			
c) Explain preparation and storage of blood product in blood banking (<i>Packed cells, fresh plasma, fresh frozen plasma, platelets concentrate, cryoprecipitate</i>)			√		√		√	
d) Explain the importance of each blood product in managing patients			√		√		√	
e) Explain principles of immunohaematological tests (<i>Direct, Indirect Coomb's and haemolysin tests</i>)			√		√		√	
f) Identify the requirements for performing Direct and Indirect Coomb's Test	√					√		√
g) Use knowledge and skills of immunohaematology to Prepare sensitized red blood cells according to SOP		√				√		√

ASSESSMENT 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;

- Assignments shall contribute 5% of the total weight
- Written tests shall contribute 10% of the total weight

- c) Practical shall contribute 25% 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 tests. The written tests 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) 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 assignments

c) Practical test

- i. Examination questions shall be set from tasks which addresses skills and wider attributes.
- ii. The practical examination shall consist of four (4) questions, with 25 marks each which shall be set from different learning task.

4.2 Semester Examination

4.2.1 Module weight

The semester examination shall consist of written and practical component which contributes 60% of the total weight of the module.

- a) Written examination shall contribute 20% of module weight
- b) Practical examination shall contribute 40% of module weight

4.2.2 Number of questions, marks distributions and sections

a) Written examination

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 (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. Examination questions shall be set from tasks which addresses skills and wider attributes.
- ii. The practical examination shall consist of four (4) questions, with 25 marks each which shall be set from different learning task.

4.2.3 Duration of assessments

- i. The duration of written examination shall be two and half (2½) hours
The duration of practical examination shall be three (3) hours

NACTEVET Reg No.....

Examination No.....

MINISTRY OF HEALTH

ORDINARY DIPLOMA (NTA LEVEL 6) IN MEDICAL LABORATORY SCIENCES

END OF SEMESTER I EXAMINATION

MODULE CODE: MLT 06210

MODULE NAME: DIAGNOSTIC HEMATOLOGY AND BLOOD TRANSFUSION

OCTOBER, 2022

TIME: 2: 30 HOURS

DATE.....

GENERAL INSTRUCTIONS:

31. Read all instructions carefully.

32. This paper consists of FIVE (5) sections.

33. Attempt all questions.

34. Write your examination number on each page of the answer sheet you use.

35. Each essay question to be answered on not more than 3 hand written papers

The table below is for OFFICIAL USE ONLY

SECTION	TYPE OF QUESTIONS	ALLOCATED MARKS	SCORED MARKS	INITIAL SIGNATURE OF MARKER	INITIAL SIGNATURE OF VERIFIER
A	MULTIPLE CHOICE	20			
B	MULTIPLE TRUE/FALSE	10			
C	MATCHING ITEM	10			
D	SHORT ANSWER	30			
E	GUIDED ESSAY	30			
TOTAL		100			

EXAMINATION ASSESMENT TOOLS

ORAL EXAMINATION SCORING FORM

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

NACTEVET Reg No..... Examination No.....

MINISTRY OF HEALTH
ORDINARY DIPLOMA (NTA LEVEL 6) IN MEDICAL LABORATORY SCIENCES
END OF SEMESTER _ EXAMINATION
MODULE CODE: MLT 06____

MODULE NAME: _____

OCTOBER, 2022

TIME: 2: 30 HOURS

DATE.....

GENERAL INSTRUCTIONS:

1. Read all instructions carefully.
2. This paper consists of five (5) sections.
3. Attempt all questions.
4. Write your examination number on each page of the answer sheet you use.
5. **Each essay question to be answered on not more than 3 hand written papers.**
6. The table below is for **OFFICIAL USE ONLY**

SECTION	TYPE OF QUESTIONS	ALLOCATED MARKS	SCORED MARKS	INITIAL SIGNATURE OF MARKER	INITIAL SIGNATURE OF VERIFIER
A	MULTIPLE CHOICE	20			
B	MULTIPLE TRUE/FALSE	10			
C	MATCHING ITEM	10			
D	SHORT ANSWER	30			
E	GUIDED ESSAY	30			
TOTAL		100			

**MINISTRY OF HEALTH
ORDINARY DIPLOMA (NTA LEVEL 6) IN MEDICAL LABORATORY SCIENCES**

MODULE CODE AND NAME: MLT 06102 OPERATIONAL RESEARCH

CONTINUOUS ASSESSMENT TEST

CHECKLIST FOR

(PRESENTATION OF RESEARCH PROPOSAL)

NAME OF INSTITUTION:CANDIDATE NUMBER:

TIME: 25 MINUTES

DATE

Scoring Criteria	Located marks	Attained score	Comments
Introduction		10	
Appearance of the presenter (dressing code, attitude, preparation)	5		
Self-introduction	5		
Main body		54	
Introduction of the research topic	6		
Ability to defend and justify the research topic	10		
Ability to defend the research objectives	10		
Ability to defend the research methodology	10		
Presentation of the work plan	8		
Justifies budget of the research	10		
Presentation skills		36	
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 research work (reading everything instead of explaining)	6		
Arrangement of power point slides and contents	5		
Time management skills	5		
Total Points	100		

EXAMINER'S GENERAL COMMENTS:

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Examiner's Name:Signature:Date:

**MINISTRY OF HEALTH
ORDINARY DIPLOMA (NTA LEVEL 6) IN MEDICAL LABORATORY SCIENCES**

MODULE CODE AND NAME: MLT06102 OPERATIONAL RESEARCH

CHECKLIST FOR RATING WRITTEN RESEARCH PROPOSAL

NAME OF INSTITUTION:

CANDIDATE NUMBER: **DATE**

SN	Component	Located marks	Attained score	Total section score	Comments
1	Preliminary pages			12	
	• Title	2			
	• Table of contents	1			
	• Acknowledgements	1			
	• List of abbreviations	1			
	• Operational definition of terms	2			
	• Summary (abstract)	5			
2	Introduction			28	
	• Background	3			
	• Statement of the problem	8			
	• Significance/Rationale of the study	4			
	• Objectives	5			
	• Research questions	3			
	• Research variables	3			
	• Hypothesis formulation	2			
3	Literature review			15	
	• Detailed literature review	15			
4	Methodology			29	
	• Study Design	4			
	• Study area	3			
	• Study population	4			
	• Sampling procedure	3			
	• Sample size	5			
	• Data collection-technique, tools	8			
	• Data processing and analysis	3			
	• Dissemination of results	2			
	• Ethical considerations	2			
	• Study limitation	2			

4	Appendices			16	
	• Implementation plan	3			
	• Budget	3			
	• Data collection tool (e.g. questionnaire)	5			
	• References	5			
	TOTAL SCORE			100	

Supervisor's name: Signature:

**MINISTRY OF HEALTH
ORDINARY DIPLOMA (NTA LEVEL 6) IN MEDICAL LABORATORY SCIENCES**

Module Code and Name: MLT 06102 Operational Research

END OF SEMESTER I EXAMINATION

**CHECKLIST FOR
(PRESENTATION OF RESEARCH REPORT)**

NAME OF INSTITUTION: **CANDIDATE NUMBER:**

TIME: 25 MINUTES **DATE**

Scoring Criteria	Located marks	Attained score	Comments
Introduction		10	
Appearance of the presenter (dressing code, attitude, preparation)	5		
Self-introduction	5		
Main body		54	
Introduction of the research topic	5		
Ability to defend the research objectives	5		
Ability to defend the research methodology	5		
Presentation of research results	15		
Discussion of research results	15		
Recommendations	5		
Conclusion	4		
Presentation skills		36	
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 research work (reading everything instead of explaining)	6		
Arrangement of power point slides and contents	5		
Time management skills	5		
Total Points	100		

EXAMINER'S GENERAL COMMENTS:

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Examiner's Name:Signature:Date:

MINISTRY OF HEALTH
ORDINARY DIPLOMA (NTA LEVEL 6) IN MEDICAL LABORATORY SCIENCES
MODULE CODE AND NAME: MLT06102 OPERATIONAL RESEARCH

CHECKLIST FOR RATING WRITTEN RESEARCH REPORT

NAME OF INSTITUTION:

CANDIDATE NUMBER: **DATE**

SN	Component	Located marks	Attained score	Total section score	Comments
1	Preliminaries pages			10	
	• Title	1			
	• Table of contents	1			
	• Acknowledgements	1			
	• List of abbreviations	1			
	• Summary (abstract)	6			
2	Introduction			15	
	• Background	2			
	• Statement of the problem	2			
	• Significance of the study	2			
	• Objectives	3			
	• Research questions	2			
	• Research variables	2			
	• Hypothesis formulation	2			
2	Literature review			10	
	• Detailed Literature Review	10			
3	Methodology			17	
	• Study Design	2			
	• Study area	2			
	• Study population	2			
	• Sampling procedure	2			
	• Sample size	2			
	• Data collection-technique, tools	2			
	• Data processing and analysis	3			
	• Ethical considerations	2			
4	Research findings	15		15	
5	Discussion	15		15	
6	Conclusion	5		5	
7	Recommendation	5		5	
8	References	5		5	
8	Appendices	3		3	
	TOTAL SCORE			100	

