# THE UNITED REPUBLIC OF TANZANIA MINISTRY OF HEALTH, COMMUNITY DEVELOPMENT, GENDER, ELDERLY AND CHILDREN PHARMACY COUNCIL





# **CURRICULUM FOR**

# TECHNICIAN CERTIFICATE

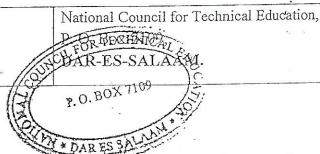
(NTA LEVEL 5)

IN

# PHARMACEUTICAL SCIENCES

Approved by the Council on Valid for five (5) years until Approval Reference 29<sup>th</sup> May, 2015 28<sup>th</sup> May, 2020 HASP 08.6/116

Pharmacy Council of Tanzania, P. O. Box 31818, DAR ES SALAAM.





#### FOREWORD

One of the statutory functions of the Council as stipulated in Section 5 (10 (e) of the National Council for Technical Education (NACTE) Act (No. 9 of 1997) is to "establish and make awards in technical education and training which are consistent in standard and comparable to related awards in Tanzania and internationally".

The Council has defined and established a range of National Technical Awards (NTA) to be conferred on graduates of technical education and training institutions upon successful completion of their respective studies in various technical fields. The NTA are competence/outcomes based defined according to specific levels of achievement and designed to testify that the holder of the award possesses the requisite competences necessary to apply competently in the relevant occupational sector. Competence in this case refers to the ability to successfully carry out some occupational activity and it is described in terms of skills, knowledge and understanding.

The NTA framework is intended to provide clear and accurate information about the purposes and outcomes of technical education and training, in a form that will be useful to stakeholders. Each technical education and training qualification/award is pegged to a level in the qualifications framework and has a competence descriptor.

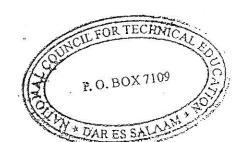
The Council has in place procedures which guide technical institutions, authorities or other interested parties to develop curricula. The procedures for curriculum development, review and validation requires an institution wishing to develop a curriculum to carry out Situational Analysis, set or adopt standards and use the same to structure the curriculum. After development of a curriculum, the institution is required to consult its stakeholders to ascertain both the information gathered through situational analysis and the curriculum. A complete submission for validation ought to include the Curriculum Information Report, Situational Analysis Report and Opinion of Stakeholders. This curriculum is validated by the Council because the institution fulfilled all the NACTE requirements for curriculum development, validation and approval.

After this approval, the institution is allowed to make small corrections, if any, during implementation. However, major changes ought to be made during review, which should take place within five years. The institution is also required, before implementing the curriculum, to facilitate the orientation of all teaching staff on CBET curriculum delivery to and ensure adherence to assessment guidelines throughout the training process.

As indicated on the cover page, this curriculum is valid for five years and it should not be used after the indicated validity date.

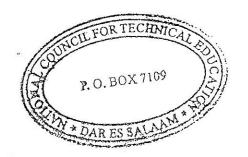
Dr. A.B. Rutayuga

Ag. EXECUTIVE SECRETARY



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# LIST OF ABBREVIATIONS

SLF Saint Luke Foundation NTA = National Technical Award NACTE National Council for Technical Education = . MUHAS Muhimbili University of Health and Allied Science RuCU = Ruaha Catholic University **CUHAS** Catholic University of Health and Allied Science MoHSW Ministry of Health and Social Welfare PHSDP Primary Health Services Development Programme = PHC Primary Health Care **MDGs** Millennium Development Goals = **NSEGPE** National Strategy for Economic Growth and Poverty Elimination **GPA** Grade Point Average **TMTB** Tanganyika Medical Training Board CA = Continuous Assessment **GMP** Good Manufacturing Practice WHO World Health Organization CTC Care and Testing Clinic COSHH Control of Substances Hazardous to Health BRELA = Business Registration and Licencing Agency SoP = Standard Operating Procedure ADR Adverse Drugs Reaction MKUKUTA Mpango wa Kukuza na Kuondoa Umasikini Tanzania ADDO Accredited Dispensing Drugs Outlets **HIV/AIDS** Human Immunovirus/Acquired Immunodeficiency Syndrome



#### **ACKNOWLEDGEMENTS**

The review and harmonization of a competence-based curriculum for pharmaceutical sciences has been accomplished through involvement of different stakeholders.

Special thanks go to the Pharmacy Council for spearheading the review and harmonization of the pharmacy training curricula after noticing that training institutions in Tanzania were using different curricula.

I would also like to extend my gratitude to St. Luke Foundation (SLF)/Kilimanjaro School of Pharmacy - Moshi for their tireless effort to mobilize funds from development partners.

Likewise, I am very greatful to Deutsche Gesellschaft Für Internationale Zusammenarbeit (Giz), Merck Kgaa, Boehringer Ingelheim Gmbh and Bayer Pharma Ag and action medoer e.V for the financial and technical support.

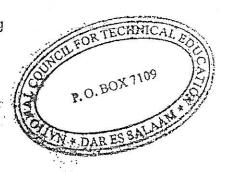
Special thanks to Institutions conducting pharmacy training for their willingness to harmonize their curricula into standard national curriculum for pharmacy NTA 4 to 6.

Likewise I do recognise great ideas and contributions by experts from Kilimanjaro School of Pharmacy, School of Pharmaceutical Sciences – MUHAS, School of Pharmaceutical Technicians – CUHAS, School of Pharmacy – RuCU, St. Peters College of Health Sciences.

I would like to acknowledge the facilitation and commitment by Members of Secretariat from the National Council for Technical Education (NACTE) for their determined support to guide us in the improvement of this curriculum.

The list of those who contributed to this great job is too long to be registered here. The Human Resources Development Directorate and the MoHSW as a whole therefore wishes to take this opportunity to thank all those who actively took part in the curriculum development for the betterment of pharmaceutical training which will impact on health services provision in Tanzania.

Dr. Bumi L.A. Mwamasage Assistant Director – Allied Health Training



#### **FOREWORD**

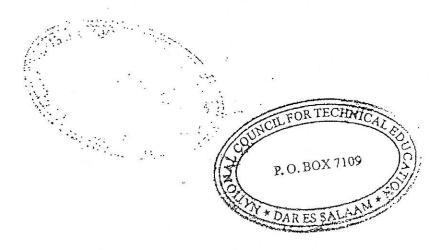
The Ministry of Health and Social Welfare (MoHSW) has committed itself to provide comprehensive access to quality health services for all Tanzanians in line with the National Development Vision and National Health Policy goals.

In order to attain these goals, the MoHSW has initiated Primary Health Services Development Programme (PHSDP). Among the strategies laid down in this programme is the human resource development to meet the human resource demand for health and a balanced skill mix.

This review and harmonization of the present pharmaceutical sciences curricula for certificate and diploma levels is in line with the policy measures currently being advocated by the MoHSW. In addition, the review of the previous curricula was intended to meet NACTE requirements for National Technical Awards (NTA) implementation, which require a modular curriculum pegged to NTA Levels as well as to match with the changing nature of health services as a bridge to responsive health care delivery.

It is the MoHSW's hope that this curriculum will enable pharmaceutical personnel to acquire necessary competencies in provision of quality pharmaceutical services to the community. It is also anticipated that institutions and stakeholders will find it useful in their academic undertakings.

Dr. Otilia T. Gowelle Director, Human Resource and Development



#### **EXECUTIVE SUMMARY**

Adoption and implementation of the National Technical Awards (NTA) system is a mandatory requirement for technical training programmes to be accredited by the National Council for Technical Education (NACTE).

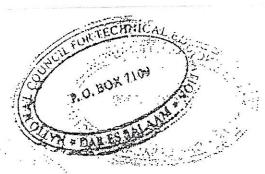
The Technician Certificate course in Pharmaceutical Sciences is a two semester programme, which has been developed to suit the needs of the health sector, the labour market demands and professional needs that exist in our country. It is one of the initiatives by the Government to modernise qualifications within the health sector.

Development of this programme is aimed at rewarding individual achievement in learning and competence gained in a variety of different ways and contexts. The introduction of this programme is geared towards increasing productivity in Pharmaceutical training institutions, providing a climbing ladder for higher learning skills opportunities and competences, and achieving more responsive education and training system, aligned with health sector employment needs.

The philosophy of developing Pharmaceutical Sciences programme at NTA Level 5 is to provide for a fairly well developed career path in pharmaceutical sciences education and competence acquisition. It opens the possibility for moving around and within the NTA qualification framework as established by NACTE and allows graduates to receive appropriate recognition.

This level is comprised of 11 Modules spread over two semesters. Each semester has 20 weeks which include theory and practical training.

Students will be required to work in dispensing, store and compounding areas under supervision as an important learning method and gaining hands on experience in the provision of pharmaceutical services as well as patient/client management and care. They will prepare reports using practical/skill books noting clearly what they will have learnt in their practice.



PART I: INTRODUCTION

#### 1.1 Background Information

The development of human resource required in various health disciplines is very important for sustainable health care services delivery and national development. Currently, with the ongoing globalisation and increased competitiveness, it is important for MoHSW to use competent professionals to spearhead increased productivity in the health sector.

The National Bureau of Statistics estimated that there were 241 hospitals, 742 health centres and 5,680 dispensaries in the country (Tanzania in Figures 2012). Despite the existing network of primary health facilities, accessibility to health care services is still inadequate due to many reasons. In some areas the accessibility to health facilities is more than 10km whereas the Government intends to improve accessibility to be less than 5 kilometres to heath facilities. On the other hand, the availability of quality health care is inequitable, due to the fact that trained health personnel especially pharmaceutical personnel are inequitably deployed and it is estimated that only 35% of the existing primary health facilities are manned by skilled workforce of whom the majority are without appropriate pharmaceutical training.

As a result this contributes to high loss of medicines and excruciating mortalities to children and women in reproductive age groups who fail to access appropriate care at the time of need. The Maternal and Child Mortality rates are quite high standing at 578 per 100,000 live births and 68 per 1,000 live births respectively (DHS 2005).

On the other hand, the country is still grappling with a high burden of diseases from malaria, HIV/AIDS, TB and Leprosy, malnutrition and micronutrient deficiencies, child illnesses, accidents and non-communicable diseases are also on the increase.

It is within this context that MoHSW is changing the current curricula from the conventional knowledge-based to outcomes / competence based curricula with a flexible mode of delivery and assessment. It is expected that with these curricula, the country can achieve the objective of having semi qualified pharmaceutical personnel, who could work effectively and assist to meet the demands of the health sector. It is also expected that training institutions will ensure that students are equipped with necessary competences, which will enable them play roles requiring basic skills, knowledge and understanding and in which they take responsibility for their professional role.

The aim of the training programme is to supply the country with adequately trained technicians in pharmacy who will work in various kealth facilities and participate in the provision of basic pharmaceutical service.

# 1.2 Objectives of Developing Schripetence Based Curriculum for Pharmaceutical Sciences Training

The main objective of developing competence-based curriculum for pharmaceutical training is to produce pharmaceutical personnel at technician level who are competent to enable them work flexibly in different work places. The specific objectives include among other things to:

(i) Help trainees acquire the competences desired with the aim of enabling them to work

Implement the training programme using a wide range provisions, which satisfy the (iii) educational criteria for competent professional training; (iv)

Make training needs clear and specific, resulting in more efficient utilisation of training

resources; and

Facilitate more efficient educational exchange between trainers and trainees. (v)

#### 2.0 PROGRAMME RATIONALE AND PHILOSOPHY

#### 2.1 Programme Rationale

The main objective of the National Health Policy (2003) is to improve the health and wellbeing of all Tanzanians, with a focus on those most at risk, and to encourage the health system to be more responsive to the needs of the people. This objective cannot be achieved without having appropriately and adequately trained pharmaceutical personnel and other health workers. According to WHO World Health Report 2006, health workers are crucially important for producing good health through the performance of health systems as they constitute a significant share of the labour force and perform key roles in all societies.

Tanzania Vision 2025, National Strategy for Economic Growth and Poverty Elimination (NSEGPE), Health for All, Primary Health Care (PHC) and Millennium Development Goals (MDGs) are not achievable without an appropriately prepared and deployed health workforce; and the training of health workers is crucial for achieving equity-oriented national health goals.

Pharmacy, like many other professions, is affected by the rapid changes currently taking place in the society, science and technology. It is also shaped by changing demography, epidemiology, health systems and consumer preference in the labour market. Therefore, strategic planning and actions should focus on investing in people, especially pre-service education to promote quality care and equity by correcting skill imbalances and in-service training to enhance the performance of the health system.

In this regard pharmaceutical sciences curricula must be responsive to changes in pharmacy practice, the society, the economy and changes in the nature of teaching and learning. It is important to provide an excellent education and training for all pharmaceutical sciences learners, to enable them and the health-system to be responsive to the changing demands of life and work in the 21st century. It also been observed that pharmacy training has been taking long time unnecessarily due to dissication of contents in career path development.

This programme has been developed in line with the above considerations, which provides for a creation of a life-long leaking culture, modulars thon, credit accumulation, student choice and scalability, leading to acquiring principle knowledge, skills and wider understanding in pharmaceutical sciences and health care practice.

The rationale for this programme is therefore to achieve more responsive pharmacy education and training system, aligned with health sector employment needs.

#### 2.2 Programme Philosophy

Philosophy describes set of values and beliefs that guide all learning experiences of the curriculum. It is the basic foundation that directs all further planning, organisation, implementation and evaluation of the curriculum. This programme is geared towards

Pharmacy is an art and science of drugs discovery, manufacturing, distribution and use, therefore:

- (i) The accessibility to the highest attainable standards of pharmaceutical services is a fundamental right of the human being irrespective of gender, age, race, religion, sociocultural differences, political affiliation, economic or social background;
- The practice of pharmacy is humanitarian in nature and requires knowledge, skills and (ii) attitudes in respect of compassion, respect and empathy, ethical and legal consideration in the provision of care;
- Environment influences health of individuals, families and community at large. (iii) Therefore, a pharmaceutical personnel must acknowledge the different interaction patterns in the environment and the impact in interaction to health and illness;
- Education is a continuous process that embraces new technology and community (iv) demands and therefore a pharmaceutical personnel shall keep abreast with current health development to render quality cost-effective services;
- The learner is a unique individual with past experiences and needs, which should be (v) respected. She/he has the responsibility for her/his own learning and self-development through active participation; and
- Collaboration is necessary for effective actions to occur. Training institutions shall (vi) maintain teamwork spirit at all levels of training environment.

It is therefore expected that since the programme adopts a modular system and will operate under semester structure, the graduates from this level will have aspirations to pursue higher qualifications in pharmacy profession. This will facilitate a large degree of flexibility for recognition of learning experiences and professional practice for the graduates' future development.

#### 3.0 VISION AND MISSION OF THE TRAINING PROGRAMME

#### 3.1 Vision

To have competent pharmaceutical personnel who will provide pharmaceutical services effectively in different health care settings and cope with existing and emerging health issues.

#### 3.2 Mission

7

To establish conducive and sustainable training environment that will allow students and graduates to perform competently at their relevant levels and aspire for attainment of higher knowledge, skills and attitudes in promoting health, preventing diseases and caring for clients in all settings IL FOR TECHN

### AIM AND OBJECTIVES OF THE PROGRAMME Aim of the Programme O. BOX 7109 4.0

4.1

The programme aim to achieve to town

- To form a flexible course that is responsive to dynamic and rapidly changing world of work and the society
- (ii)To provide pharmaceutical knowledge, skills and behaviours vital to learners, employers and the community;
- To entice self-realisation and team work skills that enable graduates to perform (iii) efficiently and aspire for higher level training;
- To build capacity to participate in the implementation of National Health Policy and its accompanying operational guidelines; and
- (v)To propagate and promote moral legal and ethical conduct among pharmacoutical

The objectives of this programme are to:

- Form a career advancement in pharmacy practice and an operational role for (i) pharmaceutical management in health care service delivery; (ii)
- Impart appropriate knowledge, skills and attitudes relevant to pharmacy practice in relation to preventive and curative health care services in the community; (iii)
- Steer creativity and innovativeness in response to challenges inherent in pharmacy practice and health care delivery;
- (iv) Inculcate a culture of team work, build critical thinking and problem solving skills in pharmacy and health care practice (V)
- Inculcate sense of citizenship, professionalism, accountability and responsibility in provision of health care services;
- Stimulate life-long learning behaviour for pharmaceutical personnel and advancement of pharmacy profession; and
- (vii) Provide an international outlook of the learning content and context so as to widen learners' advantage into regional and international labour market.

#### ADMISSION REQUIREMENTS 5.0

#### 5.1 Direct Entry Requirements

The entry qualification for this programme shall be holders of Secondary Education Certificate (CSEE) with four passes (D) including three passes in sciences subjects (i.e Physics/Engineering Sciences, Chemistry and Biology).

5.2 Equivalent entry qualifications

Pharmaceutical dispenser (holder of NTA L4 certificate) with at least two years of working experience who has passed selection examination recognized by NACTE.

5.3 Mode of Application

Applicants should apply through the (én system of the National Council for Technical Education at the www.bacte.go.tz

5.4 Selection Procedure

Selection will be done by NA applicants shall obtain joining instructions from respective training institution

#### 6.0 PROGRAMME DURATION

The NTA Level 5 programme has a total of 40 weeks of study divided in two semesters. Twenty two (22) weeks are set aside for theoretical training and eighteen (18) weeks are designated for pharmacy practice.

This level is meant to provide basic pharmaceutical sciences knowledge, skills and appropriate attitudes to students. All modules are fundamental and are intended to build students' knowledge and skills necessary for acquiring competences appropriate for modern practice of pharmacy; instil motivation for life-long learning and good foundation for progress

#### 7.0 ASSESSMENT

Assessment is an integral part of the learning process and must support and complement the learning strategies in order to achieve the required outcomes. Assessment in particular, must

#### 7.1 Principles of Assessment

- (i) Assessment will reflect aims and objectives of the overall scheme and learning outcomes of the module.
- Assessment will be designed to assist students' learning, particularly, their (ii) development as self-directed learners and the acquisition of key skills.
- (iii) Assessment will be varied to facilitate motivation and recognition of the need to adopt approaches which enable students to demonstrate and fulfill learning objectives.
- Assessment will reflect progression through studying year, with increasingly more (iv) complex methods being associated with higher order skills.

#### 7.2 Assessment Methods

The following assessment methods will be used:

#### 7.2.1 Assignments

The object of assignments is to reinforce the learning process by involving the students in finding solution to a given question or problem which require decision- making. They include tasks given to students apart from written tests and examinations or projects, so as to enhance self- development.

Individual or group assignments will be in form of written work and/or practical exercises. For each module appropriate assessment methods and instruments will be indicated. Facilitators will administer not less than two assignments for a given module in a semester.

#### 7.2.2 Competence Tests

The intention of competence tests is to measure the practical capability of learners through actual doing of a particular task or skill. This will be conducted in actual or simulated environment.

# 7.2.3 Class Room Knowledge Tests

The intention of classroom tests is to measure theoretical and practical performance of students through evaluation of written work and actual doing respectively.

There will be a minimum of two written classroom tests in each semester under supervision of qualified tutor (s). Duration of each very will be recovered than two (2) hours.

7.2.4 End of Module Examination P.O. BOX 7109

This examination shall be conducted for duration of three (3) hours under supervision of qualified tutor (s).

#### 7.3 Management of Assessment

The mode of conduct and administration of assessment shall be that approved by NACTE.

#### 8.0 MINIMUM CREDIT REQUIREMENT

This Programme has 11 modules, which are assigned 120 credits.

#### 9.0 MODULE CODING

The system of coding has adopted a combination of letters and numbers, which have a specific meaning. For example the following modules offered in the first semester by the department of Pharmaceutical Sciences may be coded respectively as PST 05103 where:

PST 05103 refers to Pharmaceutical Microbiology module.

- PS Represents the first two letters of the department "Pharmaceutical Sciences".
- T Represent the qualification at the respective level "Technician".
- Represents the respective NTA Level.
- 1 Indicates the semester in which the module is conducted
- Represents the serial number to which a particular module is assigned in the department (in this case 3<sup>rd</sup> Module).

#### 10.0 GRADING SYSTEM

Marks will be awarded out of 100 per cent. The marks so obtained from different assessment components will be graded as follows:

S/N	SCORE RANGE	GRADE	DEFINITION
1.	80 – 100	А	Excellent
2.	65 – 79	В	Good
3.	50 - 64	С	Average
4.	40 – 49	D	Poor
5.	0-39	F	Failure
6.	_	1	Incomplete
7.	0	Q	Disqualification

#### 11.0 CLASSIFICATION OF AWARD

Grades for the different score ranges are assigned points as follows:

A - 4

B - 3

C-2

D-1

F-0



The Grade Point Average (GPA) shall be computed from credits and grade weights and classified as shown below:

CLASS OF AW.	ARD [		CUMMULATIV	/E GPA	
First class	*	* ./ .	3.5 – 4.0	*	
Second class			3.0 - 3.4		
Pass	9 x 1/2		2.0 = 2.9	i: •	

An award shall be given to a student who satisfies the following conditions:

- (i) She/he must have successfully completed all modules for which the award is to be made; and
- (ii) She/he has achieved the minimum cumulative Grade Point Average (GPA) equivalent to pass.

#### 11.1 Computation of Cumulative GPA

(i) A cumulative grade point average (Cum GPA) for each candidate shall be computed by dividing the total number of grade points earned for all modules by the total number in the award examined.

i.e. cummulative  $GPA = \frac{SUM \ OF(PxN)}{SUMOF \ N}$ 

(ii) The Grade Point Average (GPA) shall be computed and truncated so that it won't provide a range of decimal point.

#### 12.0 EXAMINATIONS REGULATIONS

The General Ministry of Health and Social Welfare (MoHSW) Examination Regulations for Training Institutions on registration for examinations, board of examiners, preservation of scripts, procedures for appeals, examination offences and penalties, examination fees and certification and awards shall remain as stipulated in the MoHSW Examination Regulations.

#### 12.1 Eligibility for Examinations

- (i) A student must have been present for at least 90% of the classes to be allowed to sit for end of semester examinations.
- (ii) A student who fails to meet a minimum of 90% attendance in a particular semester with compelling reasons as determined by the participatory organs shall be allowed to repeat the semester otherwise he/she shall be discontinued from studies.
- (iii) No student shall be allowed to sit for the end of semester examinations unless his/her average continuous assessment in each module is 50% or higher.
- (iv) A student who fails to complete assignment(s) or research work in the scheduled time shall not be allowed to sit for the end of semester examinations.
- (v) Where a student who fails to fulfil the eligibility requirements stipulated, sits for the end of semester examinations, his/her examination results shall be null and void.

# 12.2 Conduct of Examinations

End of semester examinations shall be conducted under the control and supervision of MoHSW or any other body as the MoHSW shall appoint.

# 12.2 Guidance for Invigilators

# 12.3.1 Before the examination:

(i) Invigilators shall personally collect from the head of the department sealed envelopes containing examination papers and any other materials prescribed in the rubrics at least thirty minutes before the examination

(ii) Invigilators shall be present in the elemination ream at least twenty minutes before commencement of the examination.

(iii) Invigilators shall admit candidates into the symination room at least twenty minutes before commencement of the examination and secure that candidates are seated in their right places.

#### 12.3.2 During the examination:

- (i) No candidate shall be allowed out of the examination room during the first thirty minutes of the examination
- (ii) No candidate shall be allowed to leave the examination room during the last thirty minutes.
- (iii) Invigilator shall allow five minutes for the candidates to read the examination paper and ensure they have the right paper with correct number of pages.

# 12.3.3 At the end of examination:

(i) Invigilator shall tell the candidates to stop attempting the examination and assemble

- (ii) Candidates shall hand in their scripts to the invigilator and sign an examination attendance form
- (iii) No candidate shall be allowed to leave the examination room before their script
- (iv) No candidate shall be allowed to leave with any examination materials found in examination room.
- (v) Invigilators shall enter the total of scripts collected and sign in the examination attendance form (Appendix 1) and submit the scripts and the examination attendance form to the head of the department.

# 12.4 Absence from Examinations

- (i) A student who fails to appear for a scheduled examination with valid reason (s) shall be allowed to sit for that particular examination when next scheduled. The student shall not be allowed to proceed to the next semester if the missed examination(s) is for a proceed to the next semester if the missed examination(s) is for a proceed to the next semester if the missed examination (s) is for a proceed to the next semester if the missed examination (s) is for a proceed to the next semester if the missed examination (s) is for a proceed to the next semester if the missed examination (s) is for a proceed to the next semester if the missed examination (s) is for a proceed to the next semester if the missed examination (s) is for a proceed to the next semester if the missed examination (s) is for a proceed to the next semester if the missed examination (s) is for a proceed to the next semester if the missed examination (s) is for a proceed to the next semester if the missed examination (s) is for a proceed to the next semester if the missed examination (s) is for a proceed to the next semester if the missed examination (s) is for a proceed to the next semester if the missed examination (s) is for a proceed to the next semester if the missed examination (s) is for a proceed to the next semester if the missed examination (s) is for a proceed to the next semester if the next semester if the missed examination (s) is for a proceed to the next semester if the nex
- (ii) When a candidate misses an examination without valid reason(s), as determined by participatory organs (i.e. academic committees/boards), the candidate shall be discontinued from the studies.

# 12.5 Falling Sick Immediately Before or During Examination

A candidate who falls sick immediately before or during the time of a scheduled examination and is medically unable to proceed (i.e. as certification, medical officer) shall be allowed to postpone the examination until next scheduled. Any student, who is sick and nevertheless decides to take or proceed with an examination, does so applied her own risk and must abide by the results of the examination.

# 12.6 Reporting Late for Examinato

- (i) A candidate, who without value property late for an examination (more than thirty minutes after commencement of examination) shall not be allowed into the examination room but will be allowed to sit for that particular examination when next scheduled. The candidate shall not be allowed to proceed to the next semester if the missed examination(s) is/are for pre-requisite module(s).
- (ii) A candidate, who for valid reason, reports late for an examination (more than thirty minutes after commencement of examination) and pleads in writing to take the examination may, subject to the discretion of the invigilator, be allowed to do the examination within the remaining time at his/her own risk. All cases of late arrivals for examinations shall be reported in writing by the invigilator to head of department.

# 12.7 Students Progression and Disposal

- (i) The semester shall be the basic academic audit unit. All modules offered during the semester shall be assessed within that semester, at the end of each module external examiners or moderators shall be invited at the end of the semester. A student shall be allowed to proceed to the next semester if he/she passes end of module examinations in all modules prescribed in a semester.
- (ii) For every module there shall be at least two continuous assessment (CA) tests and regular assessment of competencies which shall constitute 60% of summative assessment. The end of module examination shall constitute another 40% of the summative assessment.

# 12.8 Supplementary Examination

(i) A candidate who fails one or more modules shall be allowed to sit for supplementary

(ii) A candidate who fails one or more modules must sit for supplementary examinations when scheduled before proceeding to the next semester. The student who passes a supplementary examination will be awarded a maximum of "C" grade regardless of his/her score (equivalent to 50% score). The passing of supplementary examination shall take into account the continuous assessment scores.

#### 12.9 Repeating the Semester

- A candidate who fails to obtain an average of 50% in his/her continuous assessment (i) (ii)
- A candidate who fails supplementary examination(s) shall repeat the semester. A candidate who fails a repeated semester shall be discontinued from studies. (iii)
- A candidate who fails to meet a minimum of 90% attendance in a particular semester with acceptable grounds as determined by the participatory organs shall repeat the

# 12.10 Discontinuation

- A candidate who fails to meet a minimum of 90% attendance in a particular semester (i) without acceptable grounds shall be discontinued from studies. (ii)
- When a candidate misses examination(s) without valid reason(s) shall be discontinued (iii)
- A candidate who obtains a semester GPA of less than 1.8 shall be discontinued from (iv)
- A candidate who does not appear for supplementary examination(s) without compelling reason(s) approved by participatory organs shall be discontinued from (v)
- A candidate found guilty of an examination irregularity shall be discontinued from (vi)
- A candidate who has been disqualified from an examination following his/her walking out of the examination room in protest shall be discontinued from studies.

# 12.11 Examination Irregularities or Academic Dishonesty

- Examination irregularities shall include openot limited to:

  (i) A candidate found with urran horized materials/information at any time during the examination process. Such conauthorized materials will include written pieces of papers, mobile/cellular phones than other unauthorized materials. (ii)
- A candidate attempting to copy notified by a candidate's work or permitting another
- A candidate communicating with another candidate by giving or obtaining unauthorized (iii) assistance or attempting to do so. (iv)
- A candidate removing question papers, scripts or any other examination materials found in the examination room. (v)
- A candidate starting to attempt examination before being authorized to do so. (vi)
- A candidate continuing to attempt the examination after being ordered to stop. (vii)
- A candidate refusing to obey a lawful order given by an invigilator. (viii)
- A candidate destroying or attempting to destroy evidence of suspected irregularities. (ix)
- A candidate found to have committed plagiarism.
- A candidate behaving in such a manner as to disrupt the examination process (x)(xi)
- An invigilator violating examinations regulations

12.11 Procedure for Dealing with Examination Irregularities

In case of alleged examinations irregularity:

(i) The candidate shall be stopped by the invigilator from continuing with the examination and be required to sign an examination irregularity report (Appendix 2) and the materials pertinent to the incidence to confirm that they are his/hers. However, the candidate shall be allowed to sit for the remaining examinations.

(ii)The invigilator shall counter sign and submit to the head of department the examination irregularity report together with the candidate's examination script and all pertinent materials immediately after the end of examination for further transmission through appropriate participatory organs for action as stipulated in the examination offences and penalties of the MoHSW Examination Regulations.

#### 12.12 Instruction to Students

- Candidates shall be admitted into examination room twenty minutes before the (i) examination starts.
- No candidate shall be permitted to enter the examination room 30 minutes after (ii) commencement of the examination.
- Candidates without examination numbers and identity cards shall not be allowed into (iii) the examination room.
- Candidates are responsible for consulting examinations time table for any changes. (iv)
- Candidates are not allowed to enter examination room with books, bags, purses, (v) notes, rough papers, mobile phones, or other such items.
- When candidates are allowed to bring specified items in the examination room, no (vi) borrowing from one another will be allowed during examination time, and the items allowed will be liable to inspection by the invisible
- Candidates shall follow the examination in the control of the cont (vii)
- Candidates shall write only there examination numbers on every page used. (viii)
- Candidates shall not write their remes anywhere in the script.

  No candidate shall be allowed to leave the examination room during the last thirty (ix)minutes.
- At all times during the examination the providers examination number/identi shall be conspicuously placed on the deck in front of the student by the student. (x) s examination number/identity card
- Smoking, beverages and food shall not be allowed into the examination room. Any (xi)special needs for eating, drinking or medication shall be reported to the invigilator before start of the examination.
- At the end of examination, and on the instruction of the invigilator, candidates shall be (xii) required to stop writing, and organize their work. The candidate shall personally hand in his/her scripts to the invigilator and sign to that effect.
- Candidates are allowed to bring pens, pencils and other materials explicitly prescribed (xiii) by the department into the examination room.
- For a candidate wishing to answer a call of nature may, with permission of invigilator (xiv) and under escort, leave the examination room for a period of time not exceeding five (5) minutes. Only one candidate at a time will be allowed to leave the examination room and will be monitored at all times.
- A candidate who walks out of the examination in protest shall be disqualified from that (xy)particular examination.
- (xvi) Candidates must understand that the ultimate responsibility for taking supplementary examination(s) at the correct time rests on him/her.
- (xvii) Invigilator(s) shall have the power to:
  - Specify and change the sitting

- Confiscate any unauthorized material and to remove from the examination room any candidate found with such material.
- Remove from the examination room any candidate who disrupts the examination process

12.14 Release and publication of Examination Results

The head of department may publish the examinations results provisionally subject to approval by the Tanganyika Medical and Training Board (TMTB) as recommended by the participatory organs.

12.15 Examination Components Contribution

Due to the nature of pharmacy training, this programme is constituted by theory modules and practical modules. For each module there shall be at least two continuous assessment (CA) tests and regular assessment of competencies which shall constitute 60% of summative assessment. The end of module examination shall constitute another 40% of the summative assessment.

Summary of contribution of components of assessment to final mark

Module	Continuous Assessment Tests (%)	End of Semester Examination (%)	Grand Total (%)
Theory Modules	60	40	100
Practical Modules	60	40	100

# 12.16 Examination Appeals

The appeals of candidates, who have not satisfied the examiners, should follow the process described in the training regulation of the Ministry of Health and Social Welfare.

## 13.0 Teaching personnel

Tutors for modules in this programme should have at least an Ordinary Diploma in relevant field and/or evidence of competency in respective module.

CIL FOR TECH

#### 14.0 Training regulations

14.1 Reporting to the Training Institution P.O.BOX 7109

Students selected for admission should sport to the training institution not more than 15 days after commencement of the academic year.

# 14.2 Programme Completion Requirements

For a candidate to qualify for award of the qualification of this NTA Level must have attended classes by not less than 90% of the total programme sessions, submitted required assignments and reports and passed all modules and acquired a cumulative GPA of not less than 2.0 (i.e. equivalent to a "C" grade).

#### Period of Absence. 14.3

A student who fails to meet a minimum of 90% attendance in a particular semester with compelling reasons as determined by the participatory organs shall be allowed to repeat the semester otherwise he/she shall be discontinued from studies.

#### 15.0 PROGRAMME MODULES

#### 15.1 - Semester | Modules

Code	Module Title	Scheme of Study (Hours per week)				Credits !
	appropriate and of the control of the appropriate and the control of the control	Theory	Tutorials	Practica	Assignmen	Semesto
•			- 1	]	ŧ	
PST05101	Medicines and Medical	4	-	1	1	12
	Supplies Management					
PST05102	Law and Policies in	2 .	-	-	1	7
	Pharmacy Practice					
	Discontinuity	1	1		1	12
PST05103	Pharmaceutical	4		_	•	12
	Microbiology					12
PST05104	Pharmacology and	4	1	-	1	12
	Therapeutics					en e
PST05105	Rational Use of	2	-	-	1	4
	Medicines					
PST05106	Pharmaceutical	4	1	-	1	12
	Organic Chemistry					
	SUB-TOTAL	20	3	1	6	59

#### 15.2 Semester II Modules

Code	Module Title	Module Title Scheme of Study (Hours per week)					
		Theory	Tutorial	Practical	Assignment	Semester	
PST	Quality	2	1/30/	2	<b>12</b> ),	12	
05207	Assurance of		//37	30X7109	5//		
	Pharmaceutical	المراجعة المستعددين	i <del>4</del> *.'''		7		
	Products Products		150	- Shirt			
PST	Pharmaceutics	2	M * DA	265521.000	1	20	
05208	Theory and		3 3				
	Compounding		<i>3.4</i>				
PST	Health 14	4	123	2	1	.12	
05209	Information		and the second				
	Management 1	TOTAL HE					
PST	Basic	4.	1	-	1	12	
05210	Pharmacognosy	1					
	TOTAL	12	4	10	4	56	

Code	Module	Scheme of	Practice (H	lrs per week o	ver six weeks)	Credits
20.00	Title	Dispensin		Industrial	T	
PST05 211	Pharmacy Practice	120	120	0	0	5

15.3 Summary of Modules

ary of Modules			
MODULE ITILES		SEMESTERI	SEMESTER
	12	1	
Supplies Management			
* II 222	7	1	
Pharmaceutical	12	1	-
Microbiology		•	
Pharmacology and	12	1,	
Therapeutics	1	Y	
	1	+,	
Medicines	1	V	
	112	76:	
Chemistry	12	\	
, ,			
Quality Assurance of	12		7
	12		√ ·
	1		3 <b>.</b> 00
	20		$\sqrt{}$
			-
	12		√ ·
	12		√ ·
	5		<del>,</del>
TOTAL CREDITS	120		<u>Y</u>
7.10	1.5		
and the property of the second second		and the state of the	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1
	Medicines and Medical Supplies Management Law and Policies in Pharmacy Practice Pharmaceutical Microbiology Pharmacology and Therapeutics Rational Use of Medicines Pharmaceutical Organic Chemistry  Quality Assurance of Pharmaceutical Products Pharmaceutical Products Pharmaceutics Theory and Compounding Health Information Management Basic Pharmacognosy Pharmacy Practice	MODULE TITLES  Medicines and Medical Supplies Management Law and Policies in Pharmacy Practice  Pharmaceutical Microbiology Pharmacology and Therapeutics Rational Use of Medicines  Pharmaceutical Organic Chemistry  Quality Assurance of Pharmaceutical Products Pharmaceutics Theory and Compounding Health Information Management Basic Pharmacognosy Pharmacy Practice  TOTAL CREDITS  12  12  12  12  12  13  14  15  16  17  17  18  19  19  10  10  11  11  12  12  13  14  15  16  17  18  19  10  10  11  11  12  12  13  14  15  16  17  18  18  18  18  18  18  18  18  18	MODULE TITLES    CREDITS   CREDITS     Medicines and Medical Supplies Management   12   √     Law and Policies in Pharmacy Practice   12   √     Pharmaceutical Microbiology   12   √     Pharmacology and Therapeutics   12   √     Rational Use of Medicines   12   √     Pharmaceutical Organic Chemistry   12   √     Quality Assurance of Pharmaceutical Products   12   √     Pharmaceutical Products   12   √     Pharmaceutics Theory and Compounding   12     Health Information Management   12     Basic Pharmacognosy   12     Pharmacy Practice   5

# PART II - CURRICULUM DETAILS

QUALIFICATION:	TECHNICIAN CERTIFICATE IN PHARMACEUTICAL COLENOTO
	TECHNICIAN CERTIFICATE IN PHARMACEUTICAL SCIENCES
Purpose(s) of	This qualification is intended for a person who will perform basic
Qualification:	pharmaceutical collicos months a person who will perform basic
= 22	pharmaceutical services inoabnoath ange of work activities some of
	which are non-rousine; including (dispensing), preparation of facility-
	based sterile and non-sterile pharmaceurical products, supply chain
	of others and take part in the realth education to clients in health
NTA Lavel	care settings.
NTA Level:	5
Competence	Competence involving application of skills and knowledge in broad a
Descriptors:	range of activities some of which are non-routine.
Credits at this	120
Level:	
Cumulative Credits	
	0
from Lowest Level:	
Date the	December, 2014
Qualification	
Standard Last	

8.0 Principle Outcomes, Credits and Assessment Criteria

S/No	PRINCIPLE OUTCOME	CREDITS	ASSESSMENT CRITERIA
S/No.	Apply basic principles of selection, forecasting, procurement and interfacility distribution in maintaining constant supply of medicines and medical supplies in health care settings.	CREDITS 15	(i) Principles of medicines selection correctly described. (ii) Methods of medicines procurement clearly explained. (iii) Methods for medicines quantification correctly described. (iv) Policies and legal framework guiding medicines selection and procurement correctly described. (v) Procedures for inter-facility distribution of medicines and
			medical supplies are described.  (vi) Roles of pharmaceutical assistants are well spelt out.  (vii) Transport logistics (cold chain system) are well described.  (viii) Defective, unsafe and recalled products correctly identified, removed, disposed and reported
2	Apply Good Manufacturing	20	(i) Components of GMP are correctly
	Practise (GMP) and		described.
	sterile pharmacouting 108	MCAL EDIO	(ii) Aseptic techniques are correctly explained.  (iii) Suitable conditions equipment and
	products.	1/40 Ja	(iii) Suitable conditions, equipment and use of formula and techniques for non-sterile and sterile preparations are correctly described.
	CAN + DAY	6890	(iv) Techniques and procedures for QA and QC correctly described and
			demonstrated
3	and their roles as agents of diseases and various	20	(i) Classes of microorganisms of health importance correctly described
	methods used in controlling and preventing microbial infections.		(ii) Cause, transmission, management and prevention of endemic microbial infections of
			various body systems correctly described
	***		iii) Immunology and vaccination principles correctly described
			v) Immunology preparations and uses correctly described
		(\	
			acsonned

4	Apply principles of	100		
100	Pharmacology and	20	(i)	Pharmacology and therapeutics of
,	Therapeutics in patient			essential medicines well described
1	management and rational		(ii)	National Essential Medicines List
	use of medicines in			and Standard Treatment
				Guidelines clearly recognised
8 II .	compliant with the legal framework.	- 1 10	(iii)	Impact of Irrational Use of
	maniework.			Medicines correctly described
			(iv)	Dispensing of controlled and
12				prescription only medicines
		4		according to the legal framework .
5	He-low:		4	correctly described
J.	Use ICT in the provision of	10	(i)	Different ICT applications are well
*	pharmaceutical services.	*	,,	described and demonstrated
*			(ii)	Use of relevant computer
			()	packages in delivery of
A.,				
				pharmaceutical services correctly demonstrated
			(iii)	
		11.11	(111)	Information and data for
				pharmaceutical services are
				correctly identified, stored,
			(in a)	retrieved and used
			(iv)	Documentation, report writing and
6	Utilize knowledge of	35	(3)	information sharing well practiced
	chemistry in differentiating	33	(i)	Sources of medicines correctly
	medicines in providing		1	described
	pharmaceutical care and	12 Th ->-	(ii)	Structure and function of
A	services			medicinal plant parts are well
	í í			described
	N.		(iii):\(\)	Classes of natural and synthetic
		and the same was		nedicine correctly described
		FOR TECHN		Chemical and physical properties
1	COUNT	TOWN T	JA GALLE	and uses of natural and synthetic
		2 DOV 7100	101	edicine correctly described
		O. BOX 7109	(v) (A)	ethods for cultivation,
		· 4	150%H	arvesting, extraction and storage
	TAX D	AR ES SALAA	0	f natural occurring drugs
1 -			C	orrectly described
.				asic organic chemistry applied in
1			pl	narmacy practise correctly
. 1	7		1 B	and the state of t
			de	escribed
-				escribed
			(vii) Pr	rinciples of Structure Activity elationship of drugs compounds

Ξ.

# 9.0Principal and Enabling Outcomes

S/No.	PRINCIPLE OUTCOME	ENABLING OUTCOMES
1	Apply basic principles of selection, forecasting, procurement and interfacility distribution in	1.1 Apply basic principles of procurement of medicines and medical supplies in provision of pharmaceutical services.
	maintaining constant supply of medicines and medical supplies in health care	Apply legislations governing procurement and use of medicines and medical supplies
	settings.	Describe policy guidelines in relation to procurement and use of medicines and medical supplies
2	Apply Good Manufacturing Practice (GMP) and techniques in preparation of	2.1 Describe components of GMP in preparation of pharmaceutical products
Andrew Comments and the Comments of the Commen	facility-based sterile and non-sterile pharmaceutical	2.2 Apply principles of GMP in the preparation of facility based pharmaceutical products
	products.	2.3 Apply principles of GMP in operation and maintenance of equipment and machines in a facility.
3	Describe microorganisms and their roles as agents of	3.1 Describe bacteriology of medical and pharmaceutical importance
2.54	diseases and various methods used in controlling and preventing more infections.	importance  1/09  3.3 Describe virology of medical and pharmaceutical amportance
	117	337
	RAO + NY	Describe mycology of medical and pharmaceutical importance
	•	3.5 Describe methods of controlling and preventing microbial infections.
		3.6 Describe preservation of pharmaceutical products
		3.7 Describe principles of immunology and vaccination in relation to pharmaceutical care
4	Apply principles of pharmacology in promotion of rational use of medicines	4.1 Describe pharmacology of essential medicines based on their therapeutic classes  4.2 Apply guidelines in controlling irrational use of medicines
		4.3 Apply laws governing controlled and prescription

5	Apply Information Communication Technology (ICT) in provision of health care services.	5.1 Apply relevant computer packages in delivery of pharmaceutical services.  5.2 Apply health management information system (HMIS) to capture, process and store health
		information  5.3 Use Logistics Management Information System (LMIS) in the delivery of pharmaceutical services.
6	Describe basic principles and concepts governing sources, structures and functions of	6.1 Describe basic organic chemistry in relation to provision of pharmaceutical services  6.2 Describe basic pharmacognosy in relation to
	pharmaceuticals	pharmaceuticals.  6.3 Describe chemical structures of pharmaceutical products used in health care setting.

# 10.0 Enabling and Sub-enabling Outcomes

S/No.	ENABLING OUTCOMES	SUB-ENABLING OUTCOMES .
1.1	Apply basic principles of procurement of medicines and medical	1.1.1 Describe the purpose of health supply chain management.
24 24	supplies in provision of pharmaceutical	11.2 Describe A certification methods and forecasting of medicines and medical supplies.
	services.	13 Describe procurement process of medicines and medical supplies (1)
1.2	Apply legislations governing procurement and use of medicines	Explain legislations governing procurement of the public health facilities.
	and medical supplies	1.2.2 Explain legislations governing procurement of controlled substances
		1.2.3 Explain major procurement agencies for medicines and medical supplies
1.3	Describe policy guidelines in relation to	1.3.1 Explain national medicines policy in relation to pharmaceutical services
	procurement and use of medicines and medical supplies	1.3.2 Explain policies and guidelines governing procurement of medicines for HIV/AIDS, TB and Leprosy.
		1.3.3 Explain policies and guidelines governing procurement of medicines and medical supplies for vertical programmes.
2.1	Describe components of GMP in preparation of	2.1.1 Explain the principles of Good Manufacturing Practices.

		2.1.3 Describe quality control and assurance in relati
20		to preparation of pharmaceutical products
2.2	Apply principles of GMP in the preparation of	2.2.1 Describe sterile pharmaceutical preparations
	facility based	2.2.2 Describe requirements for preparation of ster
	pharmaceutical	pharmaceutical products
	products	2.2.3 Use formula in the preparation of pharmaceutic
1		products
		2.2.4 Describe formulation of semi-solid pharmaceutic
		preparations
		2.2.5 Perform calculations on isotonicity, electrolyte
		constitutions, intravenous admixtures and rate
		flow.
2.3	Apply principles of GMP	2.3.1 Explain standard operating procedures
	in operation and	equipment and machines in facility-base
	maintenance of	pharmaceutical preparation unit
	equipment and	2.3.2 Explain the operating principles of equipment a
	machines in a facility.	machines in facility-based pharmaceutic
		preparation unit.
		2.3.3 Explain preventive maintenance procedures t
		equipment and machines in facility-base
2.4		pharmaceutical preparation unit
3.1	Describe	3.1.1 Describe fundamentals principles, concepts ar
	microorganisms and	importance of microbiology in pharmacy practice
	their roles as disease	
	causing agents.	3.1.2 Describe bacteriology of medical ar HNICAL pharmaceutical importance  3.1.3 Rescribe virology of medical and pharmaceutic
	IL FOR I	
		. co importance
	7.0.80	3.1.4 Describe parasitology of medical an
	1	
		Describe mycology of medical and pharmaceutical
	AN X DAR	importance
		3:1.6 Describe management of common bacterial, vira
.2	Describe methy is	fungal and parasitic diseases
	Describe methods of controlling and	3.2.1 Explain principles of antisepsis, disinfection and
	preventing microbial	sterilisation
	infections.	3.2.2 Describe conditions requiring antisepsis and
		disinfection
		3.2.3 Describe methods and agents used in sterilisation
.3	Describe preservation	3.3.1 Explain concepts of preserving pharmaceutica
	of pharmaceutical	products
	products	3.3.2 Describe agents used in preservation of
		pharmaceutical products
		3.3.3 Describe procedures for quality testing of
		pharmaceutical products.
4	Describe principles of	3.4.1 Describe concept of immunology and
	immunology and	immunization
4	Vocasin ati-	the contract of the contract o

		3.4.3 Describe procedures of handling immunological products
4.1	Describe pharmacology of essential medicines	4.1.1 Describe pharmacokinetics of essential medicines.
	based on their therapeutic classes .	4.1.2 Describe pharmacodynamics of essentia medicines
٠		4.1.3 Describe side effects, contraindications and adverse reactions of essential medicines
ŧ	v <sub>k</sub> .	4.1.4 Describe concept of toxicology
4.2	Apply guidelines in	4.2.1 Describe causes of irrational use of medicines
	controlling irrational use	and associated problems.
	of medicines	4.2.2 Explain essential medicines concept in promoting
		rational use of medicines.
	Ē	4.2.3 Explain the role of drug marketing and promotions
		in supporting rational use of medicines.
4.3	Apply laws governing	4.3.1 Describe procedures for handling controlled
	controlled and	medicines
	prescription medicines	4.3.2 Explain policies governing the handling of
353		prescription only medicines
	10	4.3.3 Explain legislation governing the handling of controlled medicines
5.1	Apply relevant computer	5.1.1 Organize health related data using computer
	packages in delivery of	packages
	pharmaceutical services.	5.1.2 Analyse health related data using computer packages
		5.13 Report and present health related information using computer packages
		5.1.4. Use computer applications for data backup, information searching and learning
		5.1.5 Use computer rotating in ordering, invoicing, dispersing, selling and investory management
5.2	Apply health management	5.2.1 Describe components of the WHO health management information system
	information system (HMIS) to capture.	5.2.2 Use the UHA database in conturing and managing pharmacours stata AM
	process and store	5.2.3 Perform simple data analysis using MTUHA
	health information	database
.3	Use Logistics	5.3.1 Describe the components of Integrated logistics
	Management	system
	Information System	5.3.2 Describe management of pharmaceutical
	(LMIS) in the delivery of	information in vertical programs.
1	pharmaceutical	5.3.3 Use networking programs in disseminating
	services.	pharmaceutical information.
		6.1.1 Describe the concept of organic chemistry in
1.180	chemistry in relation to	pharmacy
	provision of	6.1.2 Describe classification of organic compounds and

			Describe chemical reactions involving organicompounds				
6.2	Describe the		Describe basic structure and functions of plan parts				
	importance of basic pharmacognosy in	622	Describe natural sources of drugs				
	production of pharmaceutical	6.2.3 Explain the importance and use of natura of drugs in pharmacy practice					
	products.	6.2.4 Explain cultivation, distribution, collection and storage of medicinal plants					
ī		625	Explain methods for processing and extraction of active medicinal principals from natural sources				
		6.2.6	Identify medicinal plants containing toxic substances.				
		6.2.7	Describe active medicinal principals from natural sources				
6.3	Describe chemical	6.3.1	Explain the concept of isomerism				
	structures of pharmaceutical	6.3.2	Explain biotransformation methods of medicinal products				
	products used in health care setting.	6.3.3	Describe structure-activity relationship of drugs				

# 11.0 ASSESSMENT CRITERIA AND THEIR BENCHMARKING

11.1 Sub-enabling Outcomes, Related Tasks, Assessment Criteria, Methods and Instruments

motramento	A TEC	HAICALED		
Sub-enabling	Dolated Tagy	Assessment	Assessment	Assessment
outcomes	1/5/	Coros Ell	Methods	Instruments
1.1.1 Describe the	a) Define Supply . O. 80	Purpose of	Oral	Checklist
purpose of health	chairtia relation to	health supply	questioning	Question
supply chain	manage to Hul DAR		Written tests	papers and
management.	medicines and	management	Assignments	marking
	medical supplies	for médicines		scheme
	b) List the	and medical		Assignment
	components of	. supplies		report
	health supply	described		
	chain management			
	c) Explain the			
	components of			
la la	health supply			
	chain management			
	d) Define selection in			
1/7	relation to			
	medicines and			
	medical supplies			
	e) Explain importance			1 - 1
	of medicines and	es × res		1
	medical supplies			
	selection			

Sub-enabling outcomes	Related Tasks	Assessment	Assessment	Assessment
outcomes		Criteria	Methods	Instruments
1 1 1 1 1 1	f) Mention criteria for			•
	selection of	3		
	medicines and			
	medical supplies			
	g) List problems			
	facing selection of			
	medicines and			
1.1.2 Describe	medical supplies		•	·-
	a) Define terms	Medicines	Oral	Checklist
quantification	quantification and	quantification	questioning	Question
methods and	forecasting as	methods and	Written tests	papers and
forecasting of	applied in	forecasting of	Assignments '	marking
medicines	medicines and	medicines		scheme
	medical supplies	correctly		Assignment
	b) List objectives of	described		report
	quantification			
	c) List and explain			
	methods of			
	quantification	₹ 11		
	d) Explain application			* " " " "
	of the		-	1 - 12 -
	quantification			
	methods		H H	
	e) Describe issues to			
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	consider in	·,		
AMERICAN CONTROL OF THE PROPERTY OF THE PROPER	quantification			
1.1.3 Describe	a) Define terms used	Medicines and	Oral	Checklist
procurement	in procurement of	medical	questioning	Question
process of	medicines and	supplies	Written tests	papers and
nedicines and		5.5	Assignments	marking
nedical supplies	b) List objectives of well	procurement FOR TECHNO	7 toolgrinjents	scheme
	المنظمان الم	correctly	į.	l l
	- X/	desembado	2):	Assignment
	principles for good	o.ee.whee	2);	report .
	procurement. A			
	procurement d) Mention good	RES SALAAM		
•	procurement			
	practices for		=	* 1 1
	medicines and			7
	1			
	medical supplies		1 -	
9	e) List steps in the			
- II	procurement cycle	и и и		
1 - Ai	f) List methods for			
	procurement of			
	medicines and			
	medical supplies		- 1	
	g) Identify criteria for	- 1 1 1 1 1	2 1 U 0	
	selecting a	, 11	(0)	

Sub-enabling outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assosti Instrum
	methods	-		
	h) List sources of			
	. medicines and			
	medical supplie	6		
ages, og trækermenner i render til er	for procurement	and the second s		
	i) Explain the qua assurance in	iity '		
11 8				
	procurement of			-
	medicines and			
	medical supplie	S		
	j) Explain drug			
	donation and lis	t		
	its associated			
	benefits and			
	problems			
1.2.1 Explain	a) Explain sections	s of Legislations	Oral	Checklis
legislations	the Public	governing	questioning	Question
governing	Procurement Ac		Written tests	papers a
procurement of	2011 regulating	medicines and	Assignments	marking
medicines and	procurement of	medical		scheme
medical supplies	medicines and	supplies are		Assignm
da.car cappiloo	medical supplie	COLLINS NO CONDUCTOR SECTION OF		report
	b) Describe section	The state of the s		
	of the Tanzania	FORT	\$ <u>}</u>	W 11
	Food and	150 M		
	Cosmetics A	7.0.80X 7109	\5//	
	2003 regulative	3.0.		
9	procurement	ON LINE	7	
	medicines and	APM + DAR ES SA		1
	medical supplie	The state of the same	•	
:	c) · Describe section			
	of the Medical			
	Stores Departm	ent	5.4	
	• Act, 1993	Ç/A		
	regulating			
	procurement of			
	medicines and			
	medical supplies	e .		
1.2.2 Explain	a) Define controlle		Oral	Checklis
egislations	substances	governing	questioning	Question
governing	b) Classify controll		Written tests	papers a
procurement of	substances	controlled	Assignments	marking
controlled			/ Galgiments	scheme
substances	TO SEC. SECTIONS OF CHARGE WITHOUT AND AN INCIDENT	explained		Assignm
מחפומווֹרְבַפ	of the Tanzania	exhiained		report
	Food and			Topon

Sub-enabling	Related Tasks	Assessment	Assessment	Assessmen
outcomes		Criteria	Methods	Instruments
	procurement of			
	controlled		l l	
	substances		III.	
	d) Explain agations of			
(*:	d) Explain sections of			
	the Drugs and			
	Prevention of Illicit			1 1-1
* h	Drugs Traffic Act,			* "I "I I.
**	1971 governing		,	
	procurement of			
	controlled			
. 8	substances			
	e) Explain			
	international			
	conventions			
	ratified in the			
	United Republic of			
	Tanzania			
	regarding			
	controlled drugs			
n II	and psychotropic			
· ·	substances .	11 10	11	e
	Substances	11 - 1		
1.2.3 Explain major	a) List major	Major	Oral	Checklist
procurement	procurement	procurement	questioning	Question
agencies for	agencies for	agencies for	Written tests	papers and
nedicines and	medicines and	medicines and	Assignments	marking
			Assignments	scheme
nedical supplies	medical supplies in			1
	Tanzania	supplies		Assignment
	b) Explain the	correctly	V	report
	structure and	describes		
	functions of	OUNCIL FOR TECH	MICAN	
	Medical stores	COM	1811	
	Department	P.O. BOX 71	(S)	
	c) Explain the	1	13/1	
	Autonomous	The state of the s	***	
	supply agencies	DAR ES SALA	Am	
	for public and	The same of the sa		
	private			_
	procurement of			
	medicines (MEMS,		-	
	action Medeor			48 15
	1	н		
	etc.)	-		
*	d) Explain the prime			
	vendor systems			
0.45	\ <u></u>	NI-ti-	0-1	Checklist
	Lal Datina national	National	Oral *	Linecklist
.3.1Explain ational	a) Define national drug policy	medicines	questioning	Question

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Sub-enabling	Related Tasks	Assessment	Assessment	Assessm
outcomes		Criteria	Methods	Instrume
pharmaceutical	b) List goals of	pharmaceutical		scheme
services	national drug	services		Assignme
	policy	explained		report
	c) Outline objectives		-	
	of the national	s	8 x 11	
	drug/medicine			
	policy			,
*				
	d) List components of	of		
4	drug/medicine			
	policy			
	e) Explain the			
	importance of the	±1		
	Standard			
	Treatment			
	Guidelines			
1.3.2 Explain	a) List the vertical	Policies and	Oral	Checklist
policies and	programmes	guidelines	questioning	Question
guidelines	existing in	governing	Written tests	papers ar
governing	Tanzania	procurement of	Assignments	marking
procurement of	b) Explain procedure		Assignments .	scheme
medicines for	for procuring	HIV/AIDS, TB		Assignme
HIV/AIDS, TB and	medicines for	and Leprosy.		report
Leprosy.'	vertical			report
	programmes	are correctly		
	c) List objectives of	101		
	NACE Zalaria	100		
	and 19& Lepros	州" /别		¥
	programmes	1 /3//		
1.3.3 Explain	2) List martings of	icies and	Oral	Checklist
policies and	vertical VN * DAP	guidelines	questioning	Question
guidelines	programmes	governing	Written tests	papers an
overning	existing in	procurement of	Assignments	marking
procurement of	Tanzania	medicines and	7 (33)g1111611(5	scheme
nedicines and	b) Explain procedure	1.1		Assignme
nedical supplies for	for procurement of			_
ertical	medicines for	vertical		report
rogrammes	vertical	programmes		
	programmes	explained		
	c) Explain the role of	- Christined		
	vertical			
	programme in			
-	enhancing access to medicines			
.1.1 Explain the		Dringists		01 111 1
rinciples of Good	a) Define Good	Principles of	Oral	Checklist
lanufacturing	Manufacturing	Good	questioning	Question
andiacturing	Practices	manufacturing	Written tests	papers and

Sub-enabling	Re	elated Tasks	Assessment	Assessment	Assessment
outcomes	1		Criteria	Methods	Instruments
	(c)	Explain the	explained	-	Assignment
		importance of			report
		GMP in			
is g	1	pharmaceutical			
0.105		manufacturing			
2.1.2 Explain	a)	List the	Components of	Oral	Checklist
components of	-	Components of	GMP correctly	questioning	Question
Good ·		GMP	explained	Written tests	papers and
Manufacturing	b)	Explain premise	•	Assignments	marking .
Practices.		requirements			scheme
	c)	Explain personnel	7.		Assignment
*		requirements			report
	d)	Explain raw			
		materials	1 min		
		requirements			
	e)	Explain			
		documentation	4.		
197		requirements			
	f)	Explain equipment			1
	•	requirements		, =	
2.1.3 Describe	a)	Define quality	Quality control	Oral	Checklist
quality control and	•	assurance	and assurance	questioning	Question
assurance in	b)	Define quality	in relation to	Written tests	papers and
relation to		Control	preparation of	Assignments	marking
preparation of	-4.11	List functions of	pharmaceutical		scheme
pharmaceutical	100000 10	quality control	products		Assignment
products		laboratory in	correctly		report
		relation to	described		. opon
		preparation of			•
		pharmaceutical			5 (90)
		products	NCIL FOR TECHO		
		products	UNCL	2)\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
2.2.1 Describe	a)	Define sterile	Storile	1321	Checklist
sterile .	100	pharmaceutical (5)	Sterile F.O. BOX 7109	Orak	
pharmaceutical		products	pharmaceutical	que et oning	Question
preparations		products 1	preparations	Walten tests	papers and
·	h)	Evoloin ootomasia	A DOMINGAY LAND	Assignments	marking
į.		Explain categories.			scheme
		of sterile			Assignment
	-	oharmaceutical		1	report
Marco -	Ş	products			
	<del>-</del>				4
	50	ist qualities of			
		sterile			
	953	harmaceutical			
	þ	products			
	d) E	Explain the role of			

aseptic techniques

	Sub-enabling	Re	lated Tasks	Assessment	Assessment	Assessm
	outcomes			Criteria	Methods	Instrumo
			in pharmaceutical production			
	2.2.2 Describe	a)	Explain the	Requirements	Oral	Checklist
	requirements for	4)	concept of aseptic	for preparation	questioning -	Question
	preparation of		processing '	of sterile	Written tests	paper's and
	sterile		processing	pharmaceutical	Assignments	marking
	pharmaceutical	b)	Explain premise	products	Masignificitis	scheme
	products	ט)	requirements for	described	*	Assignmen
	products		sterile production	described	~	report
			sterile production			Тероп
		c)	Explain personnel			
			requirements for			
			sterile production	=	=	*
			ESSENTING SALES - RESPONSE - THE PARTY - STREET SALES SALES AND AND ADDRESS OF SALES SALES AND ADDRESS OF SALES SALES AND ADDRESS OF SALES SALES SALES AND ADDRESS OF SALES SA	•	•	
		d)	Explain raw			
*			materials			
			requirements for			•
			sterile production			
			4			
		e)	Explain			• 69
			documentation			
			requirements for		527	
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		sterile production		ore • • • • • • • • • • • • • • • • • • •	
		f)	Explain equipment			
0.00			requirements for		- 1	
			sterile production			
	2.2.3 Use formula in	a)	Define	Formula in the	Oral	Checklist
	the preparation of		monographs	preparation of	questioning	Question
	pharmaceutical	(d.	List different	pharmaceutical	Written tests	papers and
	products		types of	products TECHNIC	Mssignments	marking
			references used	correctly used	1511	scheme
			in pharmaceutical	3,0.BOX 710	e [I]	Assignmen
U			production	0.BOr		report
				<b>₹</b> ''	/\$ <sup>3</sup> // ·	
8	900	c)	Identify formula	(6) ES 3	A CONTRACTOR OF THE PARTY OF TH	
			for	NON-DW-B		
	7.		pharmaceutical	ė.		
			preparation			
	Na. v	d)			5.04	
			enlarge official			
			formula to obtain			
	*9	. 5	required formula			
			for compounding			
		e)	Compound semi-			
	63 5 89 5 5 5 6 5 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7		solid preparations		procedure to the second	

	Sub-enabling	Related Tasks	Assessmen	t Assessmer	
	outcomes	3	Criteria	Methods	1
	2.2.4.Describe	a) Define semisolid	Formulation		Instruments
	formulation of semi-	pharmaceutical	semi-solid	questioning	Checklist
	solid	preparations	pharmaceuti		Question
	pharmaceutical	b) List ideal	preparations	1	I Para and
	preparations	properties of sem	i- described	Assignments	1
		solid preparations			scheme
		c) Explain			Assignment
		percutaneous	# H		report
		absorption		*	s - 1/11
		d) Explain factors	-		
	· ·	affecting	~		
İ		percutaneous			
		absorption			
		e) Explain rational			
		approaches to		2	
		topical formulation			
		f) List treatment	_	View	
		target for semi-			
		solid preparations			
	-	g) Explain the	_		
	W W	components of		٠	
-	180	semi-solid			
		preparations			
		(ointments,			
		creams, pastes,			
		gels etc.)			
	F	) Explain containers,		*	
	-	closures and			
1		labelling of semi-			
		solid preparations			
2	2.5 Perform a		Calculations	0.1	
Ca	alculations on	in isotonicity and		Oral	Checklist
is	otonicity,	electrolytes	on isotonicity,	questioning	Question
el	ectrolytes,		electrolytes,	Written tests	papers and
	nstitutions,	importance of	constitutions,	Assignments	marking ·
	ravenous	isotonic solutions	intravenous		scheme
	mixtures and rate c)	Perform calculations	admixtures		Assignment
	flow .	of isotonicity by	and rate of		report
	•	freezing point	flow correctly		•
		methods, sodium	performed	CIL FOR TECHON	
		chloride equivalent,		OUNT	The state of the s
		and molecular	1/2/	,	1511
	الم	concentrations	101	P. O. BOX 7109	1 121
	(d)	Calculate -	Sept.		
		milliequivalents,	7	PARESSALAAN	A Division
	10 1.	millimoles,	=		
		milliosmoles and			
		osmolarity/osmolali		9	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1
		ty			1

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Sub-enabling	Related Tasks	Assessment	Assessment Methods	Assessmol Instrument
outcomes		Criteria	Methons	
	e) Perform calculations of constituted solutions, intravenous			
	admixture and rate of flow  f) Perform calculations of pH, buffers and buffer solutions			
2.3.1 Explain standard operating procedures of equipment and machines in facility- based pharmaceutical preparation unit	a) Define standard operating procedures b) Explain the components of an SOP c) Explain the importance of SOPs in the production of pharmaceuticals	Standard operating procedures of equipment and machines in facility-based pharmaceutical preparation unit explained	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignmen report .
2.3.2. Explain the operating principles of equipment and machines in facility-based pharmaceutical preparation unit	based	Operating principles of equipment and machines in facility-based pharmaceutical preparation unit explained	Oral questioning Written tests Assignments	Question papers an marking scheme Assignme report
	b) Explain the operating principles of an autoclave c) Explain the operating principles of a reverse osmosis machine d) Explain the operating principles of a de-		DARES SALAMAY	Andrew Person
	e) Explain the operating principles of a			

Sub-enabling	Related Tasks	Assessment	Assessment	Assessment
outcomes	Time to the second seco	Criteria	Methods	Instruments
2.3.3 Explain	a) Explain the	Preventive	Oral	Checklist
preventive	importance of	maintenance	questioning	Question
maintenance	proper preventive	procedures for	Written tests	papers and
procedures for	maintenance of	equipment and	Assignments	marking
equipment and	equipment and	machines in-		scheme
machines in facility-	machines	facility-based	7	Assignment
based	b) Describe general	pharmaceutical	-	report
pharmaceutical	considerations in	preparation	9	r
1	preventive	unit explained	•	
preparation unit	maintenance of	arm oxprame	•	
	machines and	· Ç-'	1.	
	equipment	1	To a	
-	c) Demonstrate the		ir.	37" - 8
	preventive		j <sup>h</sup>	56 56
	maintenance			·
	procedures for			, ec 🗵
	quipment and			
	machines (reverse			8
	osmosis machine,		N .	
	distiller, autoclave,			12
	de-ionizer etc.)		Oral	Checklist
3.1.1 Describe	a) Define terms used	Fundamental	N 1070010012333	Question
fundamental	in microbiology	principles,	questioning Written tests	papers and
principles, concepts	b) Explain the history	concepts and		marking
and importance of	and development	importance of	Assignments	scheme
microbiology in	of microbiology	microbiology in	77	Assignment
pharmacy practice	c) Differentiate	pharmacy		report
	between	practice		report
	eukaryotic and	described		
	prokaryotic cells			
	d) Explain	- OUR	CIL FOR TECHNICA	
	classification and	1	1	
	nomenclature of	1 2	r. o. BOX 7109	NSI)
	microorganisms	[3]	/	(\$)//·
	e) Explain the	K. S.	***	
	importance of	1	DAR ES SALAAM	
	microorganisms in			
1 100	pharmacy			
``.		1,000	, ,	
3.1.2 Describe	a) Define terms used	Bacteriology,	Oral	Checklist
bacteriology,	in bacteriology	virology,	questioning	Question
virology,	b) Describe bacterial	parasitology	Written tests	papers and
parasitology and	occurrences and	and mycology	Assignments	marking
mycology of	distributions	of medical and		scheme
medical and	c) Describe the	pharmaceutical		Assignment
pharmaceutical	structure of a	importance		report
importance	bacterial cell	described	F H d	
Importance	Davidia Singa of	and the second		

Sub-enabling outcomes	Related Tasks	Assessment	Assessment	Assessme
outcomes		Criteria	Methods	Instrument
•••	organelles/structur			msudment
	es			2
	e) Describe various			
,	drug targets in the			
	bacterial cell			
	f) Classify bacterial			
*	according to			1
	staining properties,		•	
	nutritional			
	requirements and			
	morphology	11/1-1		
	g) Describe common	#		
	bacterial diseases	-		
2	(causative agents,	- 1	·	
	transmission, signs			
	and symptoms)			
	h) Define common			
	terms used in			
	virology	1		¥
,	i) Describe general			•
	structure and			
	properties of			.5
	viruses			,
	j) Classify viruses			
The state of the state of	according to their			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	genetic and	2		
	morphological			
	properties		10376	
	k) Describe viral-		FOR TECHNICAL	EO
	host-cell	//2	7.537	121
	interaction and		. P.O. BOX 1109	
	replication		. P.O. DC	(3)
	, and a diag	1137		//
	targets in virus		DY + DAR ES SA	. Up
in the state of	n) Describe common			
	viral diseases			
ĺ	(causative agents,		2.0	
	transmission, signs			
	and symptoms)			
n				
	terms used in			*** **** ***
	mycology			
0)	and the second s			
	occurrences and			
	distributions of		i	
1	fungi	1	1	

	Sub-enabling	Related Tasks	<del></del>			
	outcomes	Tasks ,	Assessment	Assessment	TA	
		fungal cell	Criteria	Methods	Assessment	
	*.	rungai cell		-	Instruments	
		q) Classify fungi	1	¥-		
		based on their				
		sexual spores				
		(zygomycota,	. ,			
		Ascomycota.				
		basidiomycotina,	*			
	N	deuteromycota)	No.			
	i i	r) Classify and	1	** * * * * * * * * * * * * * * * * * *		
	15% 15% 15%	describe common		Ţ.		Marine State
	62	mycoses		2		STATE OF THE PARTY
	4	(causative agents,	281			The state of the s
		transmission, signs		7		S. Carrier
	-	and symptoms)				
		s) Define common			.	
		terms used in				
		parasitology				A STATE OF THE PERSON
	1	classify and list				The same of
		general		1.		-
		characteristics of				No.
	·	parasites	(90)	,	NOT INC.	
	ļ u	,	-		The state of the s	
	3	reproduction and				
		life cycles of parasites of		:		
	*	medical	1			
		importance		×	4	
	V)	Describe causative				
		agents,				
		transmission, life	COU	ICIL FOR TECHNO		Contract of
		cycle,		TORE	8 -	
		signs/symptoms of	((정(	P. O. BOX 7109	2	
		common diseases	WELL.		$\Omega$	
	The said	caused blood and		40 00	<i>!</i>	Drift director
		tissue protozoa		ARESSALAAN + NO.		100
	1	(Malaria,   •				
		Toxoplamosis.				
10		rypanosomiasis)				
	W) L	Describe causative				
	a	gents,				
	tr	ansmission, life	1			
	C	/cle,				
	Si	gns/symptoms of				
	CC	ommon diseases				
		used intestinal				
	1 611		T.	91	E E	_

	Sub-enabling	Dolote'd T- 's			
	outcomes	Related Tasks	Assessment		Assessmon
		Country	Criteria	Methods	Instrument
		Cryptosporidiosis	, -		
		Trichomoniasis)			
		x) Describe causativ	re.		
		agents,		1771	
	The state of the s	transmission, life	3		
		cycle,	The second section is a second section of the second second section se	No Account of the Contract	
	12	signs/symptoms o	f	18	
		common diseases		-	
		caused by			
		helminths (Taenia			
		Schistosoma,			
		pinworm,			
		whipworm,			
	10	y) hookworm,			
		intestinal			
		20 DESTRUCTOR SERVICE			
		roundworm, filarial			
f	3.1.3 Describe	worm) a) Describe	100		
	management of		Management	Oral	Checklist
	common bacterial.	treatment,	of common	questioning ·	Question
	viral, fungal and	provontion and	bacterial, viral,	Written tests	papers and
	parasitic diseases	control of common	fungal and	Assignments	marking
	aomo diocases	bacterial diseases	parasitic	•	scheme
		b) Describe	diseases		Assignment
		treatment,	described		report
		prevention and			where "
		control of common			
	w , s ;	viral diseases	1		
		c) Describe			2
		treatment,	İ		
		prevention and		CECHNICAL A	
	*	control of common		FOR	
		fungal diseases			( <u>)</u> ≥)
		d) Describe	1/3/	BOXILL	/S//
		treatment,		4.0. BOX 7109	7
1.		prevention and	1131		T
		control of common	183	MY . DAR ESS	
		protozoa diseases		and the same of th	
		e) Describe			
		treatment,			
		prevention and	9		
		control of common			
		helminthic			
		diseases			
	2.1 Explain	a) Define sterilisation	Principles of	Oral	Checklist
	inciples of	b) Distinguish			Question
	ntisepsis,	between		104:44	
	itisepsis,	between	Market to the control of the control	104:44	papers and

Sub-enabling	Related Tasks	Assessment	Assessment Methods	Assessment Instruments
outcomes		Criteria	Merilona	Assignment
	antisepsis	explained		report
		:e 6		·
8	c) Outline procedures			
	for disinfection and			
	sterilisation of			
	pharmaceutical			
*	equipment		•	
9 <b>*</b>	d) List factors			
	affecting	w.	1967	
n n	sterilisation and		ou mill	
	disinfection			
3.2.2. Describe	a) List criteria for	Conditions	Oral	Checklist
	selection of	requiring	questioning	Question
conditions requiring	antiseptics	antisepsis and	Written tests	papers and
antisepsis and		disinfection	Assignments	marking
disinfection	b) List criteria for selection of	described		scheme
	disinfectants .	400011100	,	Assignment
		4		report
	c) Identify factors			
N.	affecting action of			71
	antiseptics and			
	disinfectants	Various	Oral	Checklist
3.2.3 Describe	a) List methods used	F5	questioning	Question
methods and	for sterilization	diseases, their	Written tests	papers and
agents used in	b) Explain (dry and	epidemiology	Assignments	marking
sterilisation	moist) heat	and control	Assignments	scheme
	sterilisation	measures are	78	Assignment
	c) Explain gaseous	correctly		report
	sterilisation	explained	Arrana Tymen	Toport
	d) Explain radiation	1	CIL FOR TECHNICA	1
	sterilisation			<b>.</b>
1	e) Explain	127	P. O. BOX 7109	151
	sterilization by	1 1/3	F. O. BOX 7105	
, N. 3.	filtration		¥	<i>y</i> /
	f) List the criteria for		PAR ES SALAM	
	selecting			
	sterilization			
11	method			
2 2 1 Evoloin	a) Define	Principles of	Oral	Checklist
3.3.1 Explain	preservative as	microbial	questioning	Question
concepts of	used in pharmacy	Yan and an an an an an an an an an an an an an	Written tests	papers and
preserving		are correctly	Assignments	marking
pharmaceutical	b) Explain the concept of	described		scheme
products		4000177		Assignment
	preservation in	, and		report
	pharmacy			
	c) Describe factors	2-2-10-2		
	affecting action of			

Sub-enabling	Related Tas	sks	Assessment	Assessment	Assessmu
outcomes			Criteria	Methods	Instrumen
	d) List idea	I			
	propertie	es of			
	antimicr		П		
	preserva	atives			
3.3.2. Describe	a) List age		Agents used in	Oral	Checklist
agents used in		nly used as	preservation of	questioning	Question
preservation of ·	antimicr	NASC	pharmaceutical	Written tests	papers and
pharmaceutical	preserva		products	Assignments	marking
products	pharma		described		scheme
Producto	products		2	>1.5	Assignment
wit.		criteria for	5	- W	report
19	selection				
-4.	antimicr			181 0	
· ·	6233042300434061113411616411048				
	preserva				
	,	limitations			
	for use				
	antimicr				
	preserva	The second secon			
3.3.3 Describe	a) List met		Procedures for	Oral	Checklist .
procedures for		nly used for	quality testing	questioning	Question
quality testing of		esting of	of	Written tests	papers and
pharmaceutical	pharma		pharmaceutical	Assignments	marking
products	products		product	la-	scheme
<u> </u>	monogr	aphs	described	50	Assignment
	b) Explain			11 1	report
	procedu				TV.
	carrying				
	physica				
. ***	tests for				
. 50	pharma	ceutical		TECHNICALE	
	dosage	forms	1	1108	KS)
	(Hardné	ss, smell,	1/35/	2109 .	131
	colour, t	exture,	//3/	P.O. BOX 7109	<i>©</i> /
. 19	thicknes	ś,	間	7.0	77
	diamete	r, friability,	Way.	SALAM	*
	disinteg	ration etc.)		N + DAR ES	
	c) Explain			The state of the s	
.A.	procedu	ires for			
	carrying	out			
i ta e i	phýsica	quality			
Y	tests for	-			
1. S.	pharma	2420 OF 111	3		11
	dosage	forms (pH,			
	smell, c				
	conduct				
	osmolar				

Sub-enabling outcomes	Related Tasks	Assessment	1	Assessment
N N N N N N N N N N N N N N N N N N N		Criteria	Methods	Instruments
	d) Explain procedures for carrying out			
	microbiological		- 1	
- 8	quality tests for		2 - 1 - 1 - 1 - 2	
	pharmaceutical		n 1	
	products (sterility	4	•	1
	tests, etc.)			*
	e) Explain			
	procedures for			18 6
	carrying out			11.79
	chemical			
	qualitative tests			
	(volumetric			
	analysis, colour			-
	reaction,			
	dissolution test	,		
	etc.)			
	f) Explain the	1	× 10.	8
	procedures for		1. "	
	carrying out			
	chromatographic	4		
	quality tests (TLC,	9 = 1	Park 1	
	etc.)			
.4.1. Describe	a) Describe terms	Concept of	Oral	Checklist
oncept of	used in	immunology	questioning	Question
nmunology and	immunology and	and	Written tests	papers and
munization -	immunization	immunization	Assignments	marking
	b) Explain types of	correctly	i i i i i i i i i i i i i i i i i i i	scheme
Agin .		described		Assignment
	c) Differentiate			report
	between antigens			
	and antibodies	11	n II	
A. Maria	d) Explain sources of			
73/00	antibodies	•		
	e) Classify antibodies		and the second of the second o	
	f) Explain types and		OUNCIL FOR TECHN	12
	functions of	(/39		(1)
	lymphocytes	(2)	P. O. BOX 7109	151:
	g) Explain the	1137		181
	concept of		**	<i>(6)//</i>
	expanded		PARES BALAAM	The state of the s
	programme on		The state of the s	
-	immunization			
1	n) List objectives of			
	vaccination/			in .

Sub-enabling outcomes	R	elated Tasks	Assessment	Assessment	Assey
outcomes	1.		Criteria	Methods	Instrum
	i)	15.1 TO STATE OF THE STATE OF T			
		of immunization in			
		Tanzania			
3.4.2. Describe	a)	) Define vaccines	Immunological	Oral	Checklin
immunological		and sera	preparations	questioning	Question
preparations	b)	List immunological	described	Written tests	paporii ili
		preparations		Assignments	marking
i .	c)		•	,	scheme
*	′	between vaccine			Assignmen
22		and sera			report
10 10	d)				report
	4)		. 10		
it.		of immunological			
-40.		preparations	_	_	
	e)	List components of			
		vaccines and sera			
-	f)	Classify vaccines			
		and list their			
		characteristics			
3.4.3. Describe	(a)	Define cold chain	Procedures of	Oral	Checklist
procedures of	b)	List components of	handling	questioning	Question
handling	1	cold chain	immunological	Written tests	papers and
immunological	(c)	List equipment for	products	Assignments	marking
products	'	cold chain	correctly	, toolgrimonto	scheme
	di	Explain the	described		Assignment
	"	procedure for	,		report
		arrangement of			report
		vaccines in the		The state of the s	<del>_</del>
		refrigerator		TOR TECHNICA	163
				N.C.Y.	1811
8.	(e)		1/3	1109	1311
and the second		monitoring cold		P.O. BOX 1709	1811
	-	chain	1131	J	\$ # F
*	f)	List factors	16	VALUE ESECTIV	
1.		affecting quality of		N & DAR ES	
		vaccines			
F	g)	List indications and			
* *		contraindications			la la la la la la la la la la la la la l
		to vaccines			
*	h)	Explain strategies			
		for vaccine			
		delivery		II	
4.1.1 Describe	a)	Define common	Pharmacokinet	Oral	Checklist
oharmacokinetics of		terms used in	ics of essential	questioning	Question
essential		pharmacokinetics	medicines	Written tests	papers and
medicines.	b)	Explain drug	correctly	Assignments	marking
	- )	absorption	described	. icoigninonio	scheme
	c)	Explain drug			Assignment
100	9)	distribution			report
8	d)		250		report
	u)	Explain drug		()	

\*

Sub-enabling outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
Odicomes	e) Explain drug		_	
	elimination		12	
4.1.2 Describe	a) Define common	Pharmacodyna	Oral	Checklist
pharmacodynamics		mics of	questioning	Question
of essential	pharmacodynamic	essential	Written tests	papers and
medicines	S	medicines	Assignments	marking
Medicines	b) Explain drug	correctly		scheme
	receptor	described		Assignment
	interactions			report
	c) Explain the			
	concept enzyme			
	inhibitors and			
	enzyme inducers			
	d) Explain	-		
	mechanism of			
	action of drugs			
	acting on the CNS			
	e) Explain			
	mechanism of			
	action of drugs			
2	acting on the			
	cardiovascular		•	
	system	•		
i, a	f) Explain	-		
	mechanism of		Proceedings of the control of the co	7
	action of drugs			
	acting on the			
	endocrine system			
4	g) Explain			
( ·	mechanism of			12
	action of drugs		NCIL FOR TECH	
	acting on	1	COU	4645
No.	respiratory system	1/3	*	19
	- h) Explain		P. O. BOX 7109	
	mechanism of	J.		155//
	action of drugs		PAR ES SALAA	A * War
	acting on			
	gastrointestinal			
	system			
	i) Explain	_		
<i>₫</i>	mechanism of		2.5	
K-12/2	action of			
	analgesics,		,	
To the second	antipyretics and			1, 1,1
	antiinflammatory			
8	drugs			
1	urugs			

Sub-enabling outcomes	Related Tasks	Assessment	Assessment	Asses
outcomes	<del></del>	Criteria	Methods	Instrum
	acting locally on		VARIO (	
	the skin			
	k) Explain			
	mechanism of		en i	
	action of drugs			
	used in insect	and the second of the second o		
ř.	bites, venomous			1 1 1 1 1 1 1
(★8	snakes and			
	anaphylactic shock			
	l) Explain	12		
	mechanism of			
	action of drugs tha	t		
	are antineoplastic			
	and			
	immunosuppressiv			
	. е			
	m) Explain			
	mechanism of			
	action of		,	
	antimetabolites.			-
	n) Explain	-		
	mechanism of			•
	vitamins and			
	minerals	4.		
	7.4	14.00		
	o) Explain mechanism of		and the state of t	
	WAS CONTRACTED AND THE SECOND CONTRACTOR OF TH		TECHNICAL	
	action of drugs	OU FO	1 7011	
	acting on the	1/33/	1 316	
	genital-urinal .	1/37	30×1/00	
	system	1 1 3.		
	p) Explain	Hos	- ALAM	a
	mechanism of	NAME OF THE PERSON OF THE PERS	AR-ES 9	
	action for	-		
·	antiparasitic drugs			
	(antiprotozoal,			
	antihelminthics,			
	antifungal,			
	antibacterial,			
	antiviral)			
1.3 Describe side	a) Differentiate	Side effects,	Oral	Chaplett-4
fects,	between side	8		Checklist
entraindications		adverse drug	questioning	Question
nd adverse	effects, adverse	reaction and	Written tests	papers and
actions of	drug reaction and	contraindicatio	Assignments	marking
sential medicines	contraindications	ns of groups of		scheme
ochual medicines	of drugs	medicines		Assignmen
	b) Explain the	described		report
	importance of	.3		

Sub-enabling	Related Tasks	Assessment	Assessment	Assessment
outcomes		Criteria	Methods	Instruments
	contraindications			
	in initiating therapy		-	
See a see a see a see a see a see a see a see a see a see a see a see a see a see a see a see a see a see a se	and choosing of			
	appropriate			
15.1	medicines			,
	c) List side effects			
	and adverse			
9	reactions of	.0		
	essential			
	medicines	- C	1000	
	d) Identify	t in the second	COT . I	
	contraindications			
	to essential drugs	la .		
4.1.4 Describe	a) Define terms used	Concept of	Oral	Checklist
concept of	in toxicology	toxicology	questioning	Question
toxicology	b) Differentiate	correctly	Written tests	papers and
	between potency	described	Assignments	marking
	and efficacy			scheme
	c) Explain the			Assignment
	concept of graded			report
	drug response			
	d) Explain maximum			
2	effective			*
	concentration,		•	
A STATE OF THE STA	minimum effective		J. J. Co., 12	A Track of the Control of the Contro
	concentration and			
8	therapeutic		100	
	window			= T I
	.e) Explain the		2	la.
रहेर स	concept of		F 95	
	effective dose		NCIL FOR TECH	
* * * * * * * * * * * * * * * * * * *	concentration		COUNTY	WCA)
	f) Explain the	1 /3		181
1.00	concept of	1/3	P.O. BOX 7109	)6)
840	minimum lethal	1,		/\$\frac{1}{2}
	dose		DAR ES SALAAN	
	concentrations		And the second s	
	g) Classify types of			
	poisons			
	h) List commonly			
4. 30	used drugs that			
\$ 1 a	are susceptible to	A 2		\$0. r \$20
5	poisoning and their			
	antidotes			
	i) Explain	200		
	management of			
	management of			

acute poisoning

Sub-enabling	Related Tasks	Assessment	Assessment	Assessmu
outcomes		Criteria	Methods	Instrument
use of medicines	and irrational use	of medicines	Written tests	papers and
and associated	of medicines	and associated	Assignments	marking
problems.		problems		scheme
Participation of the Control of the	b) Outline types of	correctly		Assignment
¥	irrational use	described		report
	c) Explain factors			
	contributing to			
\$ %	irrational use		•	1
	d) Explain problems	*		
1 11	associated with			
	irrational medicine			
== "	usage			
	e) Explain control			
	measures for			
	irrational			
	medicines use.	Anna and an anna and an an an an an an an an an an an an an		
4.2.2. Explain	a) Explain the	Essential	Oral	Checklist '
essential medicines	concept of	medicines	questioning .	Question
concept in	essential	concept in	Written tests	papers and
promoting rational	medicines	promoting	Assignments	marking
use of medicines.	b) List problems of	rational use of		scheme
	national essential	medicines		Assignment
	medicines list	explained		report
	c) Relate essential		130	
	medicines concept	** * *** *** ****	4.4	
	with promotion of			
	rational medicines			
	use			
	d) Outline types of			a a
	interventions in		FOR TECHNICAL	
	promoting rational	1	CLFO	137
A CONTRACTOR OF THE CONTRACTOR	medicines use	1/3	1109	18
	e) Explain factors		" ~ ~ X 1/09	15/1
w <sup>*</sup>	hindering	131	1	*//
	promotion of	16.00	34100	
	rational medicines		The state of the s	
	use.			
	f) Explain the			_
	importance of the			
	Standard			
- sere come . Fig.	Treatment			
	Guidelines (STG)			
167	and the Essential			
w 162	Medicines List			
	(EML) in reducing			
g = 0	irrational use of			
nue To	medicines		·	
4.2.3 Explain the	a) Explain legal	The role of	Oral	Checklist

iuh enabling iutoomes	Related Tasks	Assessm	ent Assessm	ent Assessmen
minotions in	moderli	Criteria	Methods	Instruments
apporting ratio onal	marketing and	promotion		nts marking
## of medicin ■ es.	promotion	supporting		scheme
in of modicine		rational us	e of	Assignment
		medicines		report
Comments Recognition	b) Explain	described.		, opon
	i i i i i i i i i i i i i i i i i i i	1		1.
*	consequences of uncontrolled	of   ''		3
9	Medicines	4		
	marketing and	92		
-	promotion	j., 1		
	c) Explain the role of	of		
	information in	150		
	Medicines			
	marketing and			
	promotion			
	d) Identify ethical			
	issues in			
	Medicines			
	marketing and			
	promotion			
11.1 Describe a	- In io root in olied	Procedures fo	or Oral	Chiallin
magadures for	substances and	handling	questioning	Checklist
midling controlled	prescription only	controlled and	Written tests	Question
mulicines	medicines	prescription	Assignments	papers and
b)	and oldssily	only medicines	s .	1 3
	controlled	described		scheme
	substances			Assignment
(c)	Explain	1		report
777.7	requirements for			5."
	storing controlled			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
I had	substances.			
a)	Define term	Policies	Oral	
Middes governing	prescription only	governing the	questioning	Checklist
	medizines	handling of	Written tests	Question
b)	Explain sections of	prescription	Assignments	papers and
Midlicines	the Pharmacy Act,	only medicines	/ Assignments	marking .
	2011 regulating	are correctly		scheme
	he use and sale	explained		Assignment
	prescription only	oxpian.ou		report
	nedicines			
				( b
c) E	xplain procedure		COUNCIL FOR TECH	
fc	or issuing	:/->	7	(St.)
	rescription only	(A)	P.O. BOX 7105	1811
m	edicines in		-07/103	1 /5/1
AND AND STORY OF THE PARTY OF T	mergency		W.	1:41

Sub-enabling	Dolar Im			
outcomes	Related Tasks	Assessi	ment Assessr	ment \
-4.3.3 Explain	0) 5	Criferia	Methods	,, n 西西斯拉斯
legislation	a) Describe sec	tions Legislation	on Oral	THE REAL PROPERTY.
governing the	of the Tanzan	ia governing		Checklis
handling of	Food and	handling		
controlled	. Cosmetics Ac	t, controlled	· · · · · · · · · · · · · · · · · · ·	1
medicines	2003 regulatir	g medicine	1,1331011111	
outout62	distribution an	d correctly		scheme
1	use of medicin	es explained		Assignme
14	and medical	,		report
	supplies			•
	b) Explain section	is of	4	
	the Drugs and			
	Prevention of II	licit		
	Drugs Traffic A			
	1971 governing			
	distribution and			
	use of controlled			
	substances	ot.		
	c) Explain sections	of		
	the drugs and	, 01		
	prevention of illic	Sit .	CU FOR TECHNICA	The second second
	traffic in drugs A	ct /	NCU L	Les M
	1995 that explain	C', //3	- 1109	)\$}}
1 1	the handling of		P.O. BOX 7109	1311
	controlled	(S)		
	medicines	A. A. C.	M. DAR ES SALAND	
*	d) Explain strategies			
	of preventing	5		
	misuse of			
	controlled			
	substances	-	· ·	
5.1.1 Organize	a) Explain concepts			
health related data	of electronic data	Health related	Oral	Checklist
using computer	storage and	data using	questioning	Question
packages	arrangement	computer	Written tests	papers and
		packages are	Assignments	marking
	, and total alc	correctly		scheme
	electronic filing	organised		Assignment
75173	and application of			report
1 man ne ne ne	security to			report
	electronic data			
C	,			
1.00	summarizing data			
	(charts, graphs,		250	
5.1.2 Analyse a	tables, histogram)			
health related data	- Land Capics	Health related	Oral	Challin
using computer	from simple health	data using	questioning	Checklist
nackages	· data using	computer	Written tests	Question
the feet of the second of	spreadsheet	packages	Assignments	papers and
(b)	Generate charts	analysed		marking

mulcomes	143/5		Assessme	nt	Assessmen	t	Assessr	nont	7
Ammotions in			Criteria		Methods	•	Instrume		-
Apporting ratio onal	marketing and		promotions	in	Assignments		marking		-
men of medicin a es.	promotion		supporting				scheme		
di modioni			rational use	of			Assignme	ent .	-
			medicines		380	- 1	report	-110	
E A STATE A PROGRAMMENT	b) Explain		described.			1	30° 300 • ° * * * * * * * * * * * * * * * * * *		
	consequences	ا ء	¥	1					4
	uncontrolled	"	*	- 1					
	Medicines		. 44° - 34°			1		•	
	marketing and			.				1	
	promotion		20	- 1				1	
	c) Explain the role of	of	÷						
	information in	J1				1			
	Medicines		ř.					1	
	marketing and								
	promotion								1
	d) Identify ethical	-							is the second
	issues in					-			
	Medicines						191		
	marketing and							1	1
	promotion								
	a) Define controlled	Pi	rocedures for	- 0	Pral		h = -1.7: 1		
angodures for	substances and	- 1	andling		uestioning	1	hecklist		
s imidling controlled	prescription only	CC	ontrolled and		/ritten tests	1	uestion		
midicines .	medicines	pr	escription		ssignments	7 1 22%	pers and arking		
,   b	and oldssily	on	ly medicines			ſ	neme		1
	controlled	de	scribed			1	signment		- 1
	substances					rep			
c)	- To County				0.		· OIT		
	requirements for	1.				9			_
	storing controlled substances.								
112 Explain a)	Define term								
dialos governing	prescription only	1	icies	Ora	al	Che	cklist	-	
halling of	medicines		erning the		estioning	Que	stion		
b)	Explain sections of		dling of		tten tests	раре	ers and		
Midlicines	the Pharmacy Act,		scription	Ass	ignments	mark	king	1	
	2011 regulating		medicines			sche	me		
	the use and sale		correctly		1.	Assig	gnment		
	prescription only	expi	ained		. 1	epor	t		
	medicines								
				e					
(c) E	xplain procedure		1	OUN	CIL FOR TECHNI	12			
f	or issuing		1/4/	1	7.0	(3)	<u>.</u>		
þ	rescription only		(Š	3	P. O. BOX 7109	18	1 3		
n	nedicines in		N. A.		1,109	15			
	mergency		18	1 DX	REG	67/	<i>(</i> /-		
Si	tuations		,	Son a	A ES SALVANA	- Tarak		-e j.	
								D/	
The Market of	A 1				(2)		-	1	

Sub-enabling	Related Tasks	Assessment	Assessment	Assessment
outcomes	N 12	Criteria	Methods	Instruments
	data using		*	report
	spreadsheet		-	
	c) Generate graphs	12		
	and histogram			
	from simple health			
	data using		2	
	spreadsheet		5811	
٠.	d) Generate trends		3	4
	from data and		12	
	recognise			1 1
	problems to be	i.	15	1
	solved using			
	spreadsheet		<u> </u>	
5.1.3 Report and	a) Explain principles	Health related	Oral	Checklist
present health	of report writing	information	questioning	Question
related information	b) Deduce	correctly	Written tests	papers and
using computer	information from	reported and	Assignments	marking
packages	analysed data and	1 127	7	scheme
*	: summarise it	using		Assignment
$\hat{\eta}$ .	c) Generate	computer		report
	presentation using	packages	20	
* *	computer	ő "	= 11	
Ed Allon committee	packages	Computer	Oral	Checklist
5.1.4 Use computer	a) Define data back	applications for	questioning	Question
applications for-data backup, information	The state of the s	data backup,	Written tests	papers and
searching and	b) Describe	information	Assignments	marking
learning	importance of backing up data	searching and	Assignments	scheme
learning				Assignment
i e	c) Explain causes of data loss	correctly used		report
· · ·			5.5	-
	d) Define a computer virus			
is .	e) Classify different		The state of the s	
2	type computer		UNCIL FOR TECKNE	
	viruses		On	
	f) Describe	1	<b>3</b> 0 no.	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
	importance of	. 131	P.O. BOX 7109	)5))
	computer		*	(5)
	antiviruses	Self.	* DAR ES SALAAM *	
	g) Demonstrate	-		
	techniques in			
	searching			F.
	information on the			7
	internet			
5.1.5 Use computer	a) List common	Computer	Oral	Checklist
packages in	inventory	packages in	questioning	Question
ordering, invoicing,	management	ordering,	Written tests	papers and
dispensing selling	applications	invoicing	Assignments	marking and

Cut									
Sub-enablin	g	Related T	asks	,v	Assessm	ant.	10-		- 1
outcomes				2	Criteria	etif	Assessme	ent	Assess.
management		proced	ures for		selling and	4	Methods		Instrum
			nic orderi	ng l	inventory	u			Assigne
		c) Demon		-	managem	ant			report
1	*	procedu	ires for		are correct				
			nic invoici	na l	used	цy	٠,	13	
F0475 (\$1.00 )		d) Demons			7= # = 13		ŧ		
		procedu					į.		
		electron					8	1	
		dispensi	ng						
		e) Demons	trate	$\overline{}$				1	
		procedu							
		electroni							
		f) Carry ou		v					
		manager		5				l	
		functions		1					
F 0 . =		computer	_						
5.2.1 Describe	a	a) Define he		10	Omnon				
components of the	he	managem		th	omponents e WHO.		Oral	10	Checklist
WHO health		system		1	e vvHO, ealth		uestioning	10	Question
management	b		onents of		-		Vritten tests	p	apers and
information syste	m	the WHO	health	- 1	anagement ormation	:   A	ssignments	1	arking
		managem		1	ormation stem			S	cheme
		system		1	rectly			A	ssignmant
N ==	c)		3		scribed			1	port
		importance		40.	or ined				
		health				1	FOR TECHNIC	ALD	
		manageme	ent			CIL	FUR	ALES	
		system	00000000000000000000000000000000000000				P.O. BOX 1109		
	d)	List key				7	* 0.80X 110	150	
		performanc	e		113		٠,	1	7
		indicators o			1	Or in	DARESSA	1	
		managemen			- 2	To the	MAK EUTON		
52211- 4771		system						1	2
5.2.2 Use MTUHA	a)	Define MTU	НА	MTL	IHA	+			
database in	b)	List commor			base in	Ora			cklist
capturing and		used MTUH,			uring and	que	stioning	12	stion
managing	(c) .	Capture and		mana	aning and aging		ten tests	0.000	ers and
pharmaceutical data		process data			maceutical	ASSI	gnments	. mark	-
uala	1	MTUHA data	2	data	correctly			sche	
	_ 8	software	- 1	used	correctly			Assig	gnment
		Generate rep		~04				repor	t
	fi	rom MTUHA							
F 2 2 5	47	latabase							CONTRACTOR AND ADDRESS OF THE ADDRES
5.2.3 Perform	-	stablish tren	ids of s	impl	e data				s sademontroop.
simple data	g	harmaceutic		nalua	. 1	Oral		Check	dist
analysis using		ervices		rrarys ITUH			ioning	Quest	ion
MTUHA database		TUHA datah		TON	^	vVritte	n tests	papers	sand

Sub-enabling	Related Tasks		Assessment Methods	Instruments report	sment
outcomes	services problems from analysed data				nents
	orte			Checklist	
	1-lagrator	components of	Oral	Question	
5.3.1 Describe the	a) Define Integrated Logistics System	Integrated	questioning Written tests	papers and	
components of	(ILS)	logistics	Assignments	marking	
Integrated logistics	b) Explain the		Assignments	scheme	
system	objectives and	correctly .	* 4 T *	Assignment	
5	purpose of	described		report .	
	Logistics	80	37		
	Management	100			1
	· Information		-		nd
	System (LMIS) in		z V =		lu
	(He Corross	of			
	Tanzania.				nt
	c) Differentiate	*			110
	between pull an	id		*	
	push systems		*******		
	d) List key features	OI	CL FOR TECHNIC		
	the ILS system	Jo OU	ICIL FOR BOUND	£3.	
				1/8/1	
	(e.g. R&R form	15,	P.O. BOX 7109		
	etc.) f) Complete R and	R		<i>\$</i> }}	
2			DAR ESSALAAM		
	forms  rd): Use Electro			*	=
140	Logistic Logistic				
	Management				
	Information syst	em			
	(eLMIS)		Oral	Checklist	
5 0 0 Decoribo:	· · · · · · · · · · · · · · · · · · ·	erm Management	questioning	Question	
5.3.2 Describe		of		papers and	
management of pharmaceutical	programme	pharmaceuti		s marking	-
information in	b) Mention ver	tical information i	7.00.5	scheme	
vertical	programme	vertical the programme		Assignment	
programmes	existing in	the programme described		report	
programme	country			n	
	c) Explain importa	ance		g i jagedi a	
	of pharmaceuti	icai			
	information	n	2		
	management i	11			
	vertical			Checklist	
	programmes	Networking	Oral		
5.3.3 Use	a) Explain the		n   questioning	9	1
networking	importance of networking in	disseminat	ing   Written tes		
programs in	i: -minotion	of pharmaceu	utical Assignmer	scheme	
disseminating	acutic	al information	٦	Assignmen	nt
pharmaceutica	al priarriacous	correctly u	sed	1,63.9	

	Sub-enabling	Related Tasks	Assessment	Assessment	Assesumen
	outcomes		Criteria	Methods	Instrument
		b) List networking	-		report
		programmes used			
		in dissemination of	f		-
		pharmaceutical			
ı		information		1	
		c) Disseminate			
		pharmaceutical			
		information			
	6.1.1 Describe the	a) Define organic	Chemical	Oral	Checklist
	concept of organic	chemistry	composition of	A CASSAC CONTRACTOR CO.	Question
	chemistry in	b) List characteristics		, .	papers and
	pharmacy	of organic	disinfectants	Assignments	marking
	1990	compounds	correctly	7 toolgriments	scheme
		c) Explain the	described		Assignment
		importance of	docombcd		
		organic chemistry			report
		in pharmacy			
	6.1.2 Describe	a) Classify and			
	classification of	explain organic		and the state of t	
	organic compounds			TECHNICA	TES
	and their structures		-	100 kg	1811
		nomenclature of	1	F.O. BOX 1109	1311
		organic compound	1/5	* 0.30x	18/1
	T. A.	c) - Draw-chemical	- (3	1	
		structures of	W.	LY & DAR ES SAL	
		organic		N × DAN DE	
		compounds			
			-		
		d) List properties of different classes of			
İ					
		organic			2.5
F	6.1.3 Describe	compounds a) Define term			
1	chemical reactions	chemical reaction	Chemical	Oral	Checklist
1	involving organic		reactions	questioning	Question
1	compounds	b) List types of	involving	Written tests	papers and
	oompounds	chemical reactions	organic .	Assignments	marking
	•	in organic	compounds		scheme
İ		compounds	described		Assignment
	8	c) Explain chemical			report
		reactions in			
		organic			
-	5.2.1 Describe	compounds			
	pasic structure and	a) Explain structure	Basic structure	Oral	Checklist
		of a plant cell	and functions	questioning	Question
	unctions of plant	b) List functions of	of plant parts	1	papers and
۲	(arto :	plant cell	described	Assignments	marking

		Assessment	Assessment	Assessment Instruments	
1.15-0	Related Tasks	Criteria	Methods	-	
enabling					
omes	d) Explain basic plant		Nep a Nep a		
44-	tissues and tissue				
	systems				$\Box$
	N Explain plant				
	morphology and			•	
	functions (roots,				
	stem, leaves,				
	flowers, fruits,		v	Checklist	
	seeds and barks	) Natural	Oral	1 o rection	
	a) List sources of	Matura	questioning	papers and	
2.2 Describe	drugs	sources of	Written tests	1.000	-
atural sources o	b) Explain natural	drugs described	Assignments	scheme	
rugs	sources of drug	s described		Assignment	
	Evolain the	l l		report	
	importance of f	olant		Tebore	
	as a major sou	rce .			
	of drugs				
	d) List available				1.
	plants commo	nly			
	Land as source	ce of		al aldiet	-
	drugs in Tanz	ania	Oral	Checklist	
18	- I-in cocia	1 1110	questioning	Question .	
6.2:3.Explain t	110		Written tes	sts papers	
importance ar	d use	a and	Assignme	nts   Illaiking	
of natural sou	rces cultivation of medicinal pla	ante		1 50110111-	
of drugs in	· · · · · · · · · · · · · · · · · · ·	nomic 1 30a	01	Assignment	
pharmacy pra	influences o			report	
\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	cultivation o	t Dirair	cy		
	medicinal p				
	- mmc	explaine	ea		
	c) List comme				
	misuse of medicinal r	olants	ion Oral	Checklist	
	- ifu m	- dicinal   Quiting	lion,	ning Question	
6.2.4 Expla		distribu	ition, question	tests   papers	
cultivation,	plants	unds collect	on and	nents   Illaining	•
distribution	b) Explain m	storag	e of Assign	1 50110111	
collection	used in cu	Illivation	inal	Assignmer	II
storage of	- diamail	plants		report	
		is avnla	ned		
plants	influencir	19	a seemble to	RTECHO	
	cúltivatio	n oi	THELLE	RTECHNICAL	
\$ .	medicina	al plants	(9)	USI	
<b>5</b> .	d) List met	hods for	31 P.O.	BOX 7109	
•	collection	on	191	163/1	
	modicin	al drugs	W. S. T.	SSALAAMA	
	Medicin	storage of	March 1 Same	- A Property	

		i recment	Assessment	Assessment
Ta L mobling	Related Tasks	Assessment	Methods	Instrument
Sub-enapima		Criteria		
outcomes	g) Explain			
	adulteration of			
	crude drugs		1 1 1 2	
	h) Explain evaluation			
	of crude drugs		Oral	Checklist
	1 in the	Methods for		Question
6.2.5 Explain	importance of	processing and	Written tests	papers and
methods for	processing	extraction of	Assignments	marking
processing and	medicinal plants	active	Assignments	scheme
extraction of active	11 do of	medicinal		Assignment
medicinal principals	extraction of crude	principals from	1	report
from natural	extraction	natural		
sources	drugs			
3 8	c) List solvents used	explained		
af 1	in extraction			
	d) Explain method of	1		
	drying of crude			Checklist
	drugs	Medicinal	Oral	Question
6.2.6 Identify	a) List plants	plants	questioning	- onl
medicinal plants	containing toxic	containing	Written tests	papers and
medicilial plants	substances		Assignments	marking
containing toxic	b) Classify plants	toxic substances		scheme
substances.	containing toxic			Assignment
10 77 10	substances	identifies		report
	c) List toxic			
1 = 1 = 1	elements/princi	pal		
	s in medicinal			
	plants		Oral	Checklist
	a) List sources of	Active	questioning	Question
6.2.7 Describe	i - princina	ie illiculonion	1 3 1	ts papers and
active medicina	from medicina	principale	Assignmen	its   marking
principals from	1 (01/01/01/01/01/01/01/01/01/01/01/01/01/0	ds, thatural	Assignmen	Scheme
natural sources	glycosides, vo	latile   Sources		Assignment
	oils, fixed oils	fats described		TCHNICEPORT
			1,503	7.50
	etc.) b) List uses of a	ctive	, Civ	(2)
	b) List uses of a	m		TEL TITYOU
	principals fro	ents	- H	BOX TOB.
	medicinal pla		1131	William Control
L L	(alkaloids, glycosides, v	volatile	Mr. E.	AK Samuel Areas
	glycosides, V	e fats	100	NO. N. W. M. M. M. M. M. M. M. M. M. M. M. M. M.
	oils, fixed oil	5, 10.0		
	etc.)	8		
		ond.		g =1 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
	c) List sources	Sallo		
	uses of acti	ve		
	rincipals fr	rom		

Sub-enabling	Related Tasks	Assessment	Assessment	Assessment
outcomes		Criteria	Methods	Instruments
*	d) List sources and uses of active principals from minerals			
6.3.1 Explain the concept of isomerism  6.3.2 Explain biotransformation methods of medicinal products	a) Define isomer and isomerism b) List and explain types of isomers c) Explain the importance of isomerism in pharmacy a) Define biotransformation b) Explain metabolism of different organic compounds c) Explain the importance of	Concept of isomerism explained  Biotransformati on methods of medicinal products explained	Oral questioning Written tests Assignments  Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report  Checklist Question papers and marking scheme Assignment report
6.3.3 Describe structure-activity relationship of drugs	biotransformation  a) Define structure- activity relationship  b) Explain the importance of structure-activity relationship in pharmacy  c) Classify drugs according to their chemical nature  d) Relate organic structures of penicillins, quinolones, cephalosporin and sulphonamides, aspirin and paracetamol	Structural- activity relationship of medicines described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report

P. O. BOX 7109

PAR ES SALAAM \*

A LEANER HAS ABILITY TO / KNOWLEGDE OF CAN  SASTIFACTORY  1.1.1 Describe the purpose of health supply chain in relation to management of medicines and medical supplies  List the components of health supply chain management  The components of health supply chain management  Explain the components of health supply chain management  Explain the components of health supply chain management  Explain the components of health supply chain management  Explain the components of health supply chain management  Explain the components of health supply chain management  Explain the components of health supply chain management  Explain the components of health supply chain management  Explain the components of health supply chain management  Explain the components of health supply chain management  Explain the components of health supply chain management  Explain the components of health supply chain management  Explain the components of health supply chain management  Explain the components of health supply chain management  Explain the components of health supply chain management  Explain the components of health supply chain management  Explain the components of health supply chain management  Explain the components of health supply chain management  Explain the components of health supply chain management  Explain the components of health supplies selection in relation to medicines and medical supplies. Explain importance of medicines and medical supplies selection of medicines and medical supplies and Lists problems facing selection of medicines and forecasting as applied in medicines and medical supplies and Lists problems facing selection of medicines and medical supplies and Lists problems facing selection of medicines and medical supplies selection of medicines and medical supplies selection of medicines and medical supplies selection of medicines and medical supplies selection of medicines and medical supplies of quantification and forecasting as applied in medicines and medical supplies of quantification, expla			BENCH MARK	
1.1.1 Describe the purpose of health supply chain management.  Define supply chain in relation to management of medicines and medical supplies  List the components of health supply chain management explain the components of health supply chain management explain the components of health supply chain management  Explain the components of health supply chain management  Explain the components of health supply chain management  Explain the components of health supply chain management  Explain the components of health supply chain management  Explain the components of health supply chain management  Explain the components of health supply chain management  Explain the components of health supply chain management  Explain management  Define selection in relation to medicines and medical supplies selection and Mentions criteria for selection of medicines and medical supplies and Lists problems facinin medicines and medical supplies. List objectives of quantification and forecasting as applied in medicines and medicial supplies. List objectives of quantification and forecasting as applied in medicines and medicial supplies. List objectives of quantification and forecasting as applied in medicines and medicial supplies. List objectives of quantification and forecasting as applied in medicines and medicial supplies. List objectives of quantification of the quantification of the quantification of the quantification methods of quantification methods of quantification methods of quantification of the quantification methods of quantificati	SUB-ENABLING	A LEANER HAS	ABILITY TO / KNOWLEGI	DE OF/ CAN
Define supply chain in relation to management of medicines and medical supplies  List the components of health supply chain management of medicines and medical supplies  List the components of health supply chain management of health supply chain management Explain the components of health supply chain management Explain the components of health supply chain management  Explain the components of health supply chain management  Explain the components of health supply chain management  Explain importance of medicines and medical supplies Explain importance o	OUTCOMES			EXCELLENT
health supply chain management  frequentification methods and forecasting of medicines  Define terms quantification and forecasting of medicines  and medical supplies  and medical supplies  and medical supplies  and medicines  Define terms quantification and forecasting of medicines  and medicines and medical supplies  and medical supplies  and medicines and medicines  and medicines and medicines  and medicines and medicines and medicines and medical supplies  selection of medicines  and medicines and medicines and medical supplies  components of health supply chain management  Explain the components of health supply chain management  Explain the components of health supply chain management  Define selection in relation to medicines and medical supplies  Explain importance of medicines and medicines and medicines and medicines and medicines and forecasting as applied in medicines and medical supplies. List objectives of quantification and forecasting as applied in medicines and medical supplies. List objectives of quantification and List and explain methods of quantification, explain application of the quantification method sof quantification, explain application of the quantification methods of quantification, explain application of the quantification methods of quantification, explain methods of quantification, explain methods of quantification, explain methods of quantification of the quantification methods of quantificat	purpose of health supply chain	Define supply chain in relation to management of .medicines and	relation to management of medicines and	management of medicines and
Define selection in relation to medicines and medical supplies selection and medicines and medical supplies selection of medicines and medical supplies se		of health supply chain	health supply chain management Explain the components of health supply chain	management Explain the components of health supply chain
1.1.2 Describe quantification methods and forecasting of medicines  Define terms quantification and forecasting as applied in medicines and medical supplies. List objectives of quantification  List objectives of quantification  Define terms quantification and forecasting as applied in medicines and medical supplies, List objectives of quantification, List an explain methods of quantification of the quantification and forecasting as applied in medicines and medical supplies, List objectives of quantification, explain application of the quantification and forecasting as applied in medicines and medical supplies, List objectives of quantification and forecasting as applied in medicines and medical supplies, List objectives of quantification and forecasting as applied in medicines and medical supplies, List objectives of quantification and forecasting as applied in medicines and medical supplies, List objectives of quantification and forecasting as applied in medicines and medical supplies, List objectives of quantification and forecasting as applied in medicines and medical supplies, List objectives of quantification of the quantification and forecasting as applied in medicines and medical supplies, List objectives of quantification, explain application of the	P.O.BO	components of health eupply chain HNICATINETERMENT (1) 09	relation to medicines and medical supplies Explain importance of medicines and medical supplies selection and Mentions criteria for selection of medicines and medical supplies	relation to medicines and medical supplies, Explain importance of medicines and medical supplies selection, Mention criteria for selection of medical supplies and medical supplies and Lists problems facing selection of medicines and medical supplies
to consider in quantification.	quantification methods and forecasting of medicines	quantification and forecasting as applied in medicines and medical supplies. List objectives of quantification	quantification and forecasting as applied in medicines and medical supplies, List objectives of quantification and List and explain methods of quantification.	quantification and forecasting as applied in medicines and medical supplies, List objectives of quantification, List and explain methods of quantification, explains application of the quantification methods and describes issues to consider in
1.1.3 Describe Define terms used in procurement of Define terms used in procurement of procurement of Define terms used in procurement of pro		1 Part   Part	1000 00000	○ <b>■</b> ○

	B-ENABLING	A LEAVED WAS	BENCH MARK	
	DUTCOMES		S ABILITY TO / KNOWLEG	
	medicines and medical supplies	medical supplies, List objectives of good procurement, List operation principles for good procurement, List operation principles for good procurement and Mention good procurement practices for medicines and medical supplies  P. O. BOX 7109	supplies, List objectives of good procurement, List operation principles for good procurement, and List operation principles for good procurement.  Mention good procurement practices for medicines and medical supplies, List steps in the procurement cycle, List methods for procurement of medicines and medical supplies and Identify criteria for selecting a procurement methods	medical supplies, List objectives of good procurement, List operation principles for good procurement, List operation principles for good procurement,  Mention good procurement practices for medicines and medical supplies, List steps in the procurement cycle, List methods for procurement of medicines and medical supplies, Identify criteria for selecting a procurement methods, List sources of medicines and medical supplies for procurement, Explain the quality assurance in procurement of medicines and medical supplies and Explain drug donation
	y .e.			and list its associated benefits and problems
1.2.1	Explain legislations governing procurement of medicines and medical supplies	Explain sections of the Public Procurement Act, 2011 regulating procurement of medicines and medical supplies	Explain sections of the Public Procurement Act, 2011 regulating procurement of medicines and medical supplies and Describe sections of the Tanzania Food and Cosmetics Act, 2003 regulating procurement of medicines and	Explain sections of the Public Procurement Act, 2011 regulating procurement of medicines and medical supplies, Describe sections of the Tanzania Food and Cosmetics Act, 2003 regulating procurement of

SUB-ENABLING	3	BENCH MARK	
OUTCOMES	A LEANER I	HAS ABILITY TO / KNOW	// CODE 0=: -
2	SASTIFACTORY	- GOOD	
	100000000000000000000000000000000000000	GOOD	EXCHIENT
			the Medical Same
			Department Act 1
			regulating
		1	procurement of
			medicines and
1.2.2 Explain		×-	medical supplies
	Classify controlled	Classify controlled	Classify controlled
legislations	substances and	substances Describe	substances, Describe
governing	Describe sections of	sections of the	sections of the
procurement of controlled	aria i sinaariia i ood	Tanzania Food and	Tanzania Food and
substances	and obbinicites Act,	Cosmetics Act, 2003	Cosmetics Act must
ounotaines	2003 regulating	regulating procuremer	regulating
	procurement of medicines and	of medicines and	procurement of
		medical supplies and	medicines and
* #	medical supplies.	Explain sections of the	medical supplier,
7.		Drugs and Prevention	Explain sections of the
		of Illicit Drugs Traffic	Drugs and Prevention
	OR TECHNICAL	Act, 1971 governing	of Illicit Drugs Linth
	LEOR TECHNICAL OF	procurement of controlled substances	Act, 1971 governing
	1 16	controlled substances	procurement of
	.O.BOX 7109		controlled substance
(12)	1		and Explain
	CALAAM		international conventions ratified in
	*DARES SN.A.		the United Republic of
			Tanzania regarding
			controlled drugs and
			psychotropic
1.2.3 Explain	Liet main and the state of the		substances.
major	List major procurement	List major procurement	List major
procurement	agencies for	agencies for medicines	procurement agencina
agencies for	medicines and	and medical supplies in	for medicines and
medicines .	medical supplies in	Tanzania, Explain the	medical supplies in
. and medical	Tanzania and Explain	structure and functions	Tanzania.
supplies	the structure and	of Medical stores	Explain the structure
	functions of Medical	Department and Explain the	and functions of
	stores Department	Autonomous supply	Medical stores
	22	agencies for public and	Department, explain
		private procurement of	Autonomous supply
		medicines (MEMS,	agencies for publicand private
ap.		action Medeor etc.)	procurement of
			medicines (MEMS,
	1	-	The land,

action Medeor etc

JUB-	ENABLING		BENCH MARK	NE OFICAN
	TCOMES		ABILITY TO / KNOWLEGE	EXCELLENT
8		SASTIFACTORY	GOOD	
3.1	Explain national drug/medicin e policy in relation to pharmaceutic al services	Define national drug policy.	Define national drug policy, Outline objectives of the national drug/medicine policy and Outline objectives of the national drug/medicine policy.	Define national drug policy, List goals of national drug policy, Outline objectives of the national drug/medicine policy, List components of drug/medicine policy and explain the importance of the Standard Treatment
				Guidelines
.3.2	Explain policies and guidelines governing procurement of medicines for HIV/AIDS, TB and Leprosy. Explain policies and guidelines governing procurement of medicines and medical supplies for vertical programmes	300	List the vertical programmes existing in Tanzania. And Explain procedure for procuring medicines for vertical programmes  List objectives of vertical programmes existing in Tanzania and Explain procedure for procurement of medicines for vertical programmes  R PECHNICAL PROCESSION OF TANZANIA PROGRAMMES	List the vertical programmes existing in Tanzania, Explain procedure for procuring medicines for vertical programmes and List objectives of NACP, Malaria and TB& Leprosy programmes  List objectives of vertical programmes existing in Tanzania, Explain procedure for procurement of medicines for vertical programmes and Explain the role of vertical programme in enhancing access to medicines  Define Good
2.1.1	Explain the principles of Good Manufacturin	List principles of GMP	Manufacturing SAPractices and List principles of GMP	Manufacturing Practices, List principles of GMP and Explain the
	g Practices.		*	importance of GMP in pharmaceutical manufacturing
2.1.	2 Explain components of Good Manufacturin	List the Components of GMP, Explain premise requirements and	List the Components of GMP, Explain premise requirements, Explain raw materials	List the Components of GMP, Explain premise requirements, Explain personnel requirements, Explain

SUB-ENABLING OUTCOMES	AIFANEDU	BENCH MARK A LEANER HAS ABILITY TO / KNOWLEGDE OF/ CAN			
1	SASTIFACTORY	GOOD GOOD	EGDE OF/ CAN		
	requirements	Explain documentation requirements.			
2.1.3 Describe quality control and assurance in relation to preparation of pharmaceutic al products		Define quality assurance, Define quality Control and List functions of quality control laboratory in relation to preparation of pharmaceutical products.	Define quality assurance, Define		
2.2.1 Describe sterile pharmaceutic al preparations	List qualities of sterile pharmaceutical products.  P.O.BOX  P.O.BOX	Pharmaceutical products and Explain categories of sterile pharmaceutical products	Define sterile pharmaceutical products, Explain categories of sterile pharmaceutical products, List qualities of sterile pharmaceutical products and explain the role of aseptic techniques in assuring quality in pharmaceutical		
2.2.2 Describe requirements for	Explain the concept of aseptic processing,	Explain the concept of aseptic processing,	production  Explain the concept of aseptic processing , .		
<ul><li>preparation</li><li>of sterile</li><li>pharmaceutic</li><li>al products</li></ul>	Explain premise requirements for sterile production, and	Explain premise requirements for sterile production,	Explain premise requirements for sterile production,		
	Explain raw materials requirements for sterile production	Explain personnel requirements for sterile production,	Explain personnel requirements for sterile production,		

		DEMOLIBRATIO	
OUTCOMES	'A LEANER HAS	BENCH MARK S ABILITY TO / KNOWI	ECDE OF C
	SASTIFACTORY	GOOD	
		Explain raw materials	EXCELLENT
		requirements for steril	i i i i i i i i i i i i i i i i i i i
		production and Explain	1
		documentation	Explain document :
		requirements for sterile	Explain documentation requirements for
		production	sterile production and
		ţ	Explain equipment
			requirements for
2.2.3 Use formuļa		<b>4.</b>	sterile production.
in the	nh	Define monographs,	Define monographs,
preparation	pramaceutical	Identify formula for	List different types of
of	preparation,	pharmaceutical	references used in
pharmaceutic	Reduce or enlarge official formula to	preparation,	pharmaceutical
al products	obtain 10	Reduce or enlarge	production,
	formula for	official formula to	Identify formula for
	000000	obtain required formula	pharmaceutical
	10	or compounding and compound semi-solid	preparation,
	preparations	reparations	Reduce or enlarge
941	(ointments, creams	integrations, creams,	official formula to
	gels, pastes engli FOR LEC	ets Castes etc.)	obtain required formula for
32	[3]		compounding and
	(2 P.O. BOX 7	109 )(၂)	Compound semi-solid
	The state of the s		preparations.
	DAR ES SAL	AM * Constant	(ointments, creams,
2.4 Describe	D = C.		gels, pastes etc.)
formulation	phorma - "	t ideal properties of	Define semisolid
of semi-solid	proporofie		pharmaceutical
pharmaceutic	List ideal properties   Fxr		preparations.
al	of semi-solid abs	\0 mul.	List ideal properties of
	preparations, Exr	loin vati	semi-solid
	explain factors app	roosh	preparations. Explain percutaneous
	form	nulation,	bsorption.
	percutaneous List	treatment target for   F	Explain factors
	Explain the	i-solid a	ffecting percutaneous
	picp	arations, la	bsorption.
S	volial in	ain the E	xplain rational .
(	ninta I	ponents of semi-	oproaches to topical
p	0.01	preparations for	rmulation.
E	xplain containers, paste	ments, creams, Lis	st treatment target
cl	osures and labelling Expla	un f	semi-solid
of	semi-solid closur		eparations.
l pr	eparations. of ser		plain the
	01.261	III-SOIIQ	mponents of semi-

g

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SUB-ENABLING	<u> </u>	n — i i a i	
OUTCOMES  A LEANER HAS ABILITY TO KNOWLEGDE OF CAN			
	CACTICACTORY		
	SASTIFACTORY	GOOD	EXCLLEN
			Explain contames
			closures and labels
4	į.		of semi-solid
2.2.5 Perform			preparation.
7,10,1,11	Define terms used in	Define terms used in	Define terms made
calculations	isotonicity and	isotonicity and	isotonicity and
on	electrolytes,	electrolytes,	electrolytes
isotonicity,	Explain the	Explain the importance	Explain the
electrolytes,	importance of isotonic	1	importance of motor
constitutions,	solutions,	Perform calculations of	solutions.
intravenous	Perform calculations	isotonicity by freezing	Perform calculations
admixtures	of isotonicity by	point methods, sodium	of isotonicity by
and rate of	freezing point	chloride equivalent,	freezing point
flow	methods, sodium	and molecular	methods, sodium
	chloride equivalent,	concentrations,	chloride equivalent
	and molecular	Calculate	and molecular
	concentrations and	milliequivalents,	concentrations,
	Calculate	millimoles, milliosmoles	Calculate
nas	milliequivalents,	and	milliequivalents,
	millimoles,	osmolarity/osmolality	millimoles,
	milliosmoles and	and Perform	milliosmoles and
	osmolarity/osmolality	calculations of	osmolarity/osmolality
U FOR TECHNIC	U.	constituted solutions,	Perform calculations
HCIL!	COC.	intravenous admixture	of constituted
109	)2].	and rate of flow.	solutions, intravenous
7.0.BOX 7109			admixture and rate of
1151	37/		flow and
DARESSAUAN			Perform calculations
			of pH, buffers and
	A server of		buffer solutions
2.3.1 Explain	Explain the	Define standard	Define standard
standard	components of an	operating procedures	operating procedures
operating	SOP	and explain the	Explain the
procedures of		components of an	components of an
equipment and		SOP.	SOP and explain the
machines In			importance of SOI'. III
facility-based			the production of
pharmaceutical			pharmaceuticals.
preparation unit			p. lai maoodioala.
2225			
TOTAL CONTROL AND STREET	List equipment used	List equipment used in	List equipment used in
[ ]	n facility based	facility based	facility based
	oharmaceutical	pharmaceutical	pharmaceutical
equipment and	oreparation unit	preparation unit	preparation unit

	SUB-ENABLING					
	OUTCOMES	BENCH MARK				
	COTOONIES	A LEANER HA	A LEANER HAS ABILITY TO / KNOWLE			
		SASTIFACTORY	GOOD	EXCELLENT		
		Explain the operating	Explain the operating	Explain the operating		
		principles of an	principles of an	principles of an		
		autoclave and explain	autoclave,	autoclave,		
	•	the operating	Explain the operating	Explain the operating		
		principles of a	principles of a reverse	principles of a reverse		
	1	reverse osmosis	osmosis machine and			
		machine	Explain the operating	Explain the operating		
		*	principles of a de-	principles of a de-		
			ionizer.	ionizer and		
	k.		- (4,0)	Explain the operating		
	0.005		i e	principles of a distiller.		
	2.3.3 Explain	Demonstrate the	Describe general	Explain the		
	preventive	preventive	considerations in	importance of proper		
	maintenance	maintenance of	preventive	preventive		
	procedures for	equipment and	maintenance of	maintenance of		
	equipment and	machines (reverse	machines and	equipment and		
	machines in	osmosis machine,	equipment and	machines, describe		
	facility-based	distiller, autoclave,	demonstrate the	general considerations		
	pharmaceutical	de-ionizer etc.)	maintenance of	in preventive		
	preparation unit		equipment and	maintenance of		
			machines (reverse	machines and		
1		, ,	osmosis machine,	equipment and		
		- American Control of the Control of	distiller, autoclave, de-			
	and the second	COUNCIL	Tonizereic	maintenance		
		139	(E)	procedures for		
		(z) P.O	BOX 7109	equipment and		
		112		machines (reverse		
		* DAD	SSALAAMARO	osmosis machine,		
			SALIVATION	distiller, autoclave, de-		
	all as			ionizer etc.)		
-			n n	V		
ا ا	3.1.1 Describe	Define terms used in	Differentiate between	Define terms used in		
	fundamental	microbiology,	eukaryotic and	microbiology, Explain .		
	principles,	Differentiate between	prokaryotic cells,	the history and		
	concepts and	eukaryotic and	Explain classification	development of		
	importance of	prokaryotic cells and	and nomenclature of	microbiology,		
•	microbiology in	Explain classification	microorganisms and	Differentiate between		
	pharmacy '	and nomenclature of	Explain the importance	eukaryotic and		
	practice		of microorganisms in	prokaryotic cells,		
			pharmacy	Explain classification		
			E.B.	and nomenclature of		
				microorganisms and		
		2 24		explain the importance		
		100		of microorganisms in		
	. 1			pharmacy		
	*i	<b>*</b>	l l	The second secon		

C.

SUB-ENABLING	
OUTCOMES	A LEANE
	SASTIFACTO
3.1.2 Describe	Define terms use
bacteriology,	bacteriology,
virology,	Describe bacteri
parasitology	occurrences and
and mycology	distributions,
of medical and	Describe the
pharmaceutica	
importance	
in portaince	bacterial cell,
	List functions of
	different bacteria
	organelles/structu
*	Describe various
	targets in the
	bacterial cell,
=	Classify bacterial
	according to stain
	properties, nutrition
	requirements and
	morphology,
4	Describe common
	bacterial diseases
	(causative agents,
	transmission, sign
	and symptoms),
	Define common
	terms used in
	virology,
THE ALL PARTY	Classify viruses
R. TECHNICADED	according to their
	genetic and
1/a 0	morphological
*0.80x 1/189	properties,
3° /3]]	List various drug
853	targets in virus,
Y & DAK	Describe common
exist to the second	viral diseases
	(causative agents,
	transmission, signs
	and symptoms),
(2) W	Define common
	terms used in
	mycology,
8	Describe occurrence
	and distributions of
	fungi and
	ng and

## BENCH MARK A LEANER HAS ABILITY TO / KNOWLEGDE OF CARL

STIFACTORY e terms used in riology, ribe bacterial rences and utions. ibe the ure of a rial cell. nctions of nt bacterial elles/structures. be various drug s in the ial cell, y bacterial ing to staining ties, nutritional ments and ology, oe common al diseases tive agents, ission, signs nptoms). common sed in viruses ng to their and logical es, ous drug n virus, common eases ve agents, sion, signs ptoms), ommon ed in

occurrences

Describe the

GOOD Define terms used in bacteriology, Describe bacterial occurrences and distributions. Describe the structure of a bacterial cell, List functions of different bacterial organelles/structures. Describe various drug targets in the bacterial cell. Classify bacterial according to staining properties, nutritional requirements and morphology, Describe common bacterial diseases (causative agents, transmission, signs and symptoms), Define common terms used in virology, Describe general structure and properties of viruses, Classify viruses according to their genetic and mórphological properties. Describe viral-host-cell interaction and replication List various drug targets in virus, Describe common viral diseases (causative agents, transmission, signs and symptoms), Define common terms used in mycology, Describe occurrences

and distributions of

Define terms bacteriology Describe had OCCURTOR OR # distributiona Describe IIIa of a bacterial List functions different harlan organelle-/aln describe variation targets in the cell. Classify Lin total according to properties, militar requirements in morphology. Describe comma bacterial dean (causative again transmission, and symptoms) Define common used in virology Describe genuit structure and properties of vini Classify virus according to their genetic and morphological properties, Describe viral land interaction and replication. List various drug targets in virus. Describe commun viral diseases (causative agental transmission, again and symptom:), Define common le used in mycology Describe occurrent

LXCELL

SUB-ENABLING BENCH MARK **OUTCOMES** A LEANER HAS ABILITY TO / KNOWLEGDE OF/ CAN..... SASTIFACTORY GOOD EXCELLENT structure of a fungal fungi, and distributions of cell Describe the structure funqi. of a fungal cell, Describe the structure Classify fungi based on of a fungal cell, their sexual spores Classify fungi based (zygomycota, on their sexual spores Ascomycota, (zygomycota, basidiomycotina, Ascomycota, deuteromycota), basidiomycotina, Classify and describe deuteromycota), common mycoses Classify and describe (causative agents, common mycoses transmission, signs causative agents, symptoms) and transmission, signs Define common terms and symptoms), used in parasitology Define common terms used in parasitology, Classify and list general characteristics of parasites. 1 Describe reproduction and life cycle of as. parasites, Describe causative of agents, transmission, life cycle. signs/symptoms of common diseases caused blood and tissue protozoa P.O. BOX 7109 Malaria, of Toxoplamosis, Trypanosomiasis), Describe causative nly agents, transmission, al life cycle, signs/symptoms of common diseases caused intestinal and urogenital protozoa (Giardiasis, Amoebiasis,

Cryptosporidiosis,

Trichomoniasis) and

of

SUB-ENABLING	BENCH MARK			
OUTCOMES	A LEANER HAS ABILITY TO / KNOWLEGDE OF/ CAN			
190	SASTIFACTORY	GOOD	EXCELLENT	
			common diseases caused by helminths (Taenia, Schistosom) pinworm, whipworm,	
ī		5	hookworm, intestinal roundworm, filarial worm)	
2420-3	, , , , , , , , , , , , , , , , , , ,	D	D	
3.1.3 Describe	Describe treatment,	Describe treatment,	Describe treatment,	
management of	prevention and	prevention and control	prevention and control	
common	control of common	of common bacterial	of common bacterial	
bacterial, viral,	bacterial diseases,	diseases	diseases	
fungal and parasitic	Describe treatment,	Describe treatment,	Describe treatment,	
diseases	prevention and control of common	prevention and control of common viral	prevention and control of common viral	
uiscases	viral diseases and	diseases	diseases	
	Describe treatment,	Describe treatment,	Describe treatment,	
	prevention and	prevention and control	prevention and control	
	control of common	of common fungal	of common fungal	
	fungal diseases	diseases and Describe	diseases	
	and the second second second second	treatment, prevention	Describe treatment,	
	FOR TECHNICAL FO	and control of common	prevention and control	
	Je.	protozoa diseases	of common protozoa	
	P.O.BOX 1109		diseases	
(3)	8.00		Describe treatment,	
16	TO STUDIES	•	prevention and control	
	DAR ES TO	# ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) (	of common helminthic	
		! ^ · ·	diseases	
3.2.1 Explain	Distinguish between	Define sterilisation	Define sterilisation	
principles of	sterilisation,	Distinguish between in	Distinguish between	
antisepsis,	disinfection and,	sterilisation,	sterilisation,	
disinfection and	antisepsis, and	disinfection and,	disinfection and,	
sterilisation	Outline procedures	antisepsis	antisepsis	
	for disinfection and	Outline procedures for disinfection and	Outline procedures for disinfection and	
	sterilisation of	disinfection and sterilisation of	sterilisation of	
	pharmaceutical	pharmaceutical	pharmaceutical	
	equipment	equipment	equipment	
2004	0)	одагритоги	List factors affecting	
			sterilisation and	
	υ		disinfection	

	į p			
3.2.2 De	escribe	List criteria for	List criteria for selection	m I list saits in C
	nditions	selection of	· ·	10 J.Z. 10 J.Z. 10 J. 10 J.Z. 10 J. 10 J.Z. 10 J. 10 J.Z. 10 J
	quiring	disinfectants	of antiseptics and List criteria for	selection of
10	tisepsis and	donnoctants		antiseptics,
1	sinfection		selection of	List criteria for
			disinfectants	selection of
1. F				disinfectants and
	•	t .	8	Identify factors,
1. 44				affecting action of
				antiseptics and
3.2.3 De	scribo	1:4 1: 1		disinfectants,
×.	thods and	List methods used for		List methods used for
		sterilization,	sterilization, Explain	sterilization,
A 1000	ents used in rilisation	Explain (dry and	(dry and moist) heat	Explain (dry and
Sie	ilisation	moist) heat	sterilisation ,Explain	moist) heat
		sterilisation and	gaseous sterilisation,	sterilisation,
		Explain gaseous	.Explain radiation	Explain gaseous
1		sterilisation	sterilisation and	sterilisation,
			Explain sterilization by	Explain radiation
			filtration	sterilisation;
				Explain sterilization
		•		by filtration and
				List the criteria for
				selecting sterilization
				method
1 ***	(plain	Define preservative	Define preservative as	Define preservative as
1	ncepts of	as used in pharmacy	used in pharmacy,	used in pharmacy,
	eserving	and ,	Explain the concept of	Explain the concept of
I	armaceutic	Explain the concept	preservation in	preservation in
al	products	of preservation in	pharmacy and describe	pharmacy,
		pharmacy FOR TECH		Describe factors
		pharmacy FOR TECHNICA	of antimicrobial	affecting action of
			ke servatives	antimicrobial
	į:	F. O. BOX 7109	[]5]]	preservatives and
	,		\\$\mathrew{\partial}{\partial}	List ideal properties of
	11	PAR ES SALAAM .		antimicrobial
•		A ES SALAA		preservatives
3.3.2 Des	scribe	List agents commonly	List agents commonly	List agents commonly
age	ents used	used as antimicrobial	used as antimicrobial	used as antimicrobial
in	9900-000-000-000	preservative for	preservative for	
pres	servation	pharmaceutical	pharmaceutical	preservative for
of		products	products and the	pharmaceutical
pha	rmaceutic	producto	criteria for selection of	products,
	roducts	. "	antimicrobial	List the criteria for
			Contract of the Contract of th	selection of
			preservatives	antimicrobial
				preservatives and
				limitations for use of
9		de qu	ti di Ma	antimicrobial

3.3.3 Describe procedures for quality testing of pharmaceutic al products

List methods commonly used for quality testing of pharmaceutical products from monographs, Explain procedures for carrying out physical quality tests for solid pharmaceutical dosage forms (Hardness, smell, colour, texture, thickness, diameter, friability. disintegration etc.) and Explain procedures for carrying out physical quality tests for liquid pharmaceutical dosage forms (pH, smell, colour, conductivity, osmolarity etc.)

List methods commonly used for quality testing of pharmaceutical products from monographs, Explain procedures for carrying out physical quality tests for solid pharmaceutical dosage forms (Hardness, smell, colour, texture, thickness, diameter, friability, dissolution. disintegration etc.), Explain procedures for carrying out physical quality tests for liquid pharmaceutical dosage forms (pH, smell, colour, conductivity, osmolarity etc. Explain procedures for carrying out microbiological quality tests for pharmaceutical products (sterility tests, etc.) and Explain procedures for carrying out

List methods commonly used quality testing of pharmaceutical products from monographs,. Explain procedu carrying out phy quality tests for pharmaceutical dosage forms (Hardness, smell colour, texture, thickness, diamel friability, dissoluli disintegration eld Explain procedur carrying out physic quality tests for life pharmaceutical dosage forms (pll smell, colour, conductivity, osmolarity etc.), Explain procedure carrying out microbiological qui tests for pharmaceutical products (sterility tests, etc.), Explain procedure carrying out chemi qualitative tests (volumetric analys) colour reaction. dissolution test eld and Explain the procedures for carrying out chromatographic quality tests (TLC, etc.)

3.4.1 Describe concept of immunology and immunization

Describe terms used in immunology and immunization, Explain types of immunity

Describe terms used in immunology and immunization, Explain types of immunity,

Describe terms use in immunology and immunization, Explain types of immunity,

antigens and antigens and antigens and antibodies. antibodies antibodies, Explain sources of Explain sources of Explain sources of antibodies. antibodies, antibodies, Classify antibodies Classify antibodies Classify antibodies Explain types and Explain types and Explain types and functions of functions of functions of lymphocytes and lymphocytes, lymphocytes, Explain the concept Explain the concept of Explain the concept of of expanded expanded programme expanded programme programme on on immunization and on immunization, immunization. List objectives of Explain schedules of vaccination/ immunization in immunisation Tanzania and programme. List objectives of vaccination/ immunisation programme. 3.4.2 Describe Differentiate between Define vaccines and Define vaccines and immunologic vaccine and sera. sera. sera, List characteristics of List immunological List immunological preparations immunological preparations. preparations, preparations and Differentiate between Differentiate between components of vaccine and sera. vaccine and sera. vaccines and sera List characteristics of List characteristics of A STATE OF THE PARTY. immunological immunological preparations and preparations, components of List components of vaccines and sera vaccines and sera and Classify vaccines and list their characteristics 3.4.3 Describe Define cold chain, Define cold chain, Define cold chain, procedures List components of cold List equipment for List components of of handling cold chain. chain, cold chain, immunologic List equipment for cold Explain the procedure List equipment for cold al products for arrangement of chain, chain vaccines in the Explain the procedure Explain the procedure refrigerator and for arrangement of for arrangement of List factors affecting vaccines in the vaccines in the quality of vaccines refrigerator. refrigerator. List tools for monitoring List tools for cold chain and monitoring cold chain, List factors affecting List factors affecting quality of vaccines quality of vaccines. List indications and contraindications to P.O. BOX 7109 vaccines and explain

strategies for vaccine

	V2000-1 43404	13-25-
4.1.1	Doggail	
1 : . :	Describe	
	pharmacok	in
	etics of	
	essential	
	medicines.	
		.
		- 1
4.1.2	escribe	+
	harmacody	
n	amics of	
	ssential	
	edicines	li
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Define common terms used in pharmacokinetics, Explain drug absorption, and Explain drug metabolism

Define common terms used in pharmacokinetics, Explain drug absorption, Explain drug distribution and explain drug metabolism.

Define man used in pharm.icul image Explain drug absorption, Explain drug distribution Explain drug metabolism .m. explain drug elimination

Define common terms used in pharmacodynamics, Explain drug receptor interactions, Explain the concept enzyme inhibitors and enzyme inducers, Explain mechanism of action of drugs acting on the CNS, Explain mechanism of action of drugs acting on the cardiovascular system, Explain mechanism of action of drugs acting on respiratory system

Explain mechanism :: eaction of drugs acting on gasimintestinal

3.0.BOX 7109 Explain mechanism of action of analgesics. antipyretics and antiinflammatory drugs and explain mechanism of action of drugs used in insect bites, venomous snakes and anaphylactic shock

Define common terms used in pharmacodynamics, Explain drug receptor interactions, Explain the concept enzyme inhibitors and enzyme inducers, Explain mechanism of action of drugs acting on the CNS. Explain mechanism of action of drugs acting on the cardiovascular

system, Explain mechanism of action of drugs acting on the endocrine system,

Explain mechanism of -action of drugs acting on respiratory system, Explain mechanism of action of drugs acting on gastrointestinal system,

Explain mechanism of action of analgesics, antipyretics and antiinflammatory drugs, Explain mechanism of action of drugs acting locally on the skin, Explain mechanism of action of drugs that are antineoplastic and immunosuppressive

and

Define common is used in pharmacodynami Explain drug round interactions, Explain the concell enzyme inhibitora enzyme inducina Explain mechanian action of drug..... on the CNS, Explain mechanian action of drugs at the on the cardiovarable system,

Explain mechanian action of drugs action on the endocrine system,

Explain mechanism action of drugs ar line on respiratory system Explain mechanism of action of drugs acting on gastrointestinal system,

Explain mechanism of action of analgesics antipyretics and anh inflammatory drug:, Explain mechanism of action of drugs acting locally on the skin, Explain mechanism of action of drugs used in insect bites,

venomous snakes and

		antihelminthics, antifungal,	immunosuppressive, Explain mechanism o	
		antibacterial, anti	viral action of antimetabolites,	
			Explain mechanism of	)es F
			vitamins and minerals, Explain mechanism of	g
			action of drugs acting	
			on the genital-urinal 'system, and explains	р
***			mechanism of action for antiparasitic drugs	
			(antiprotozoal,	₹\$
		*	antihelminthics, antifungal,	
4.1.3 Describe side effects,	Differentiate between	The straight of the factor of the feature of the fe	antibacterial, antiviral)	
contraindicatio c	side effects, adverse drug reaction and	side effects, adverse drug reaction and	side effects, adverse	
is and adverse of	contraindications of rugs and can	contraindications of	drug reaction and contraindications of	
Cosemial	ist side effects and	drugs, List side effection	ts I druge	es
, a	dverse reactions of ssential medicines.	of essential medicine and can Identify	importance of effects.	s
		contraindications to	adverse drug reaction and contraindications	ł
	NCIL FOR TECHNI	essential drugs.	in initiating therapy and choosing of	4.
1	SOUNCE	are)	appropriate medicines.	
	7. O. BOX 7109	) <u>(</u> 5)	List side effects and adverse reactions of	he
Ä	DAR ES SALAAM		essential medicines and can Identify	hd
4.1.4 Describe Def			contraindications to	y
concept of toxio	ine terms used in cology,	Define terms used in	essential drugs.  Define terms used in	g
Diffe	erentiate between	toxicology, Differentiate between	toxicology, Differentiate between	
Expl	ain the concept	potency and efficacy, Explain the concept of	potency and efficacy.	S
of gr	adea aray	graded drug response.	graded drug response.	
List	commonly used e	Explain maximum effective concentration,	Explain maximum	
susce	eptible to	ninimum effective oncentration and	concentration,	of
poiso antido	ning and their th	erapeutic window.	minimum effective concentration and	e
Expla	in management ef	xplain the concept of fective dose	therapeutic window, n Explain the concept of	
or acq		encentration, st commonly used	effective dose	
	dru	ags that are	concentration,	

_			
		susceptible to poisoning and their antidotes and can explain management acute poisoning	of Classify types.
4.2.1 Describe	Diff		drugs that are susceptible to poisoning and tantidotes and management of
causes of irrational use of medicines and associated problems.	Outline types of irrational use and explain factors contributing to	Differentiate between rational and irrational use of medicines, Outline types of irrational use, Explain factors contributing to irrational use and	Differentiate betherational and irrational use of medicinon. Outline types of irrational use, Explain factors
4225	irrational use.	problems associated with irrational medicine usage.	irrational use, Explain problems associated with irrational medicing
modicines.	Explain the concept of essential medicines, List problems of national essential medicines list, and Relate essential medicines concept with promotion of	List problems of national essential medicines list, Relate essential; medicines concept with promotion of rational	measures for irration medicines use.  Explain the concept essential medicines of national essential medicines list, Relate essential medicines concept with prometi
l r	ational medicines ise	medicines use and Outline types of interventions in promoting rational medicines use	rational medicines use, Outline types of interventions in promoting rational medicines use, Explain facts
The state of the s	DARES SALAMA	ii S G	hindering promotion of rational medicines use and Explain the importance of the standard Treatment Suidelines (STG) in educing irrational use imedicines

	O. Tlain the role	Explain legal	Explain legal limitations	Explain legal
4.2	.3 Explain the role of Medicines	limitations on	on Medicines	limitations on
		Medicines marketing	marketing and	Medicines marketing
6	marketing and	11100101110	promotion,	and promotion,
	promotions in	and promotion and	Explain consequences	Explain consequences
3	supporting	Explain	of uncontrolled	of uncontrolled
	rational use of	consequences of	Medicines marketing	Medicines marketing
	medicines.	uncontrolled	and promotion and	and promotion,
	W-1	Medicines marketing		Explain the role of
		and promotion	Identify ethical issues	information in
	i e		in Medicines marketing	Medicines marketing
			and promotion'	and promotion and
				Identify ethical issues
		- 1 m	n ee we gener	
		. <u></u>		in Medicines
		, Š.		marketing and
		3.5		promotion
1	3.1 Describe	List and classify	Define controlled	Define controlled
4.		controlled substances	substances and	substances and
	procedures for	CONTROLLED SUBStations	prescription only	prescription only
	handling		medicines, they can list	medicines,
	controlled	7	and classify controlled	List and classify.
1	medicines		substances	controlled substances
			Substances	and .
				Explain requirements
^				for storing controlled
00	8			substances.
2	S. J. T. S. S. S. S. S. S. S. S. S. S. S. S. S.		D. C Lawren	Define term
4.	3.2 Explain policies	Explain procedure for	Define term	prescription only
4	governing the	issuing prescription	prescription only	medicines,
	handling of	only medicines in	medicines and, Explain	Explain sections of the
1	prescription	emergency situations	procedure for issuing	Pharmacy Act, 2011
	only medicines	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	prescription only	
	22 30 1 2		medicines in	regulating the use and
	n.*		emergency situations	sale prescription only
		CIL FOR TECHNICAL		medicines and Explain
	// (SU)			procedure for issuing
	(3)	P.O. BOX 7109		prescription only
	(12)	P.O.BOX	-5555.	medicines in
		30//		emergency situations
	2.2 Evoluin	TAXABLE Liens of	Describe sections of	Describe sections of
4	.3.3 Explain	the Drugs and	the Tanzania Food and	the Tanzania Food
	legislation	Prevention of Illicit	Cosmetics Act, 2003	and Cosmetics Act,
	governing the	Drugs Traffic Act,	regulating distribution	2003 regulating
	handling of	-	and use of medicines	distribution and use of
	controlled	1971 governing	and medical supplies,	medicines and
	medicines	distribution and use	Explain sections of the	medical supplies,
		of controlled	Drugs and Prevention	Explain sections of the
		substances and,		Drugs and Prevention
		Explain strategies of	of Illicit Drugs Traffic	of Illicit Drugs Traffic
		preventing misuse of	Act, 1971 governing	of more or age
				NO. 20 MAR STATE OF THE PARTY O

	controlled substances	distribution and use of	Act, 19/1 preside
		controlled substances,	
		and	controlled substant
		Explain strategies of	Explain section
		preventing misuse of	drugs and proving
		controlled substances	of illicit traille in its
			Act, 1995 II at 1
			the handling of
· ·	4		controlled medicin
			and Explain strate
			of preventing man
			of controlled
5446			substances
5.1.1 Organize	Demonstrate	Demonstrate electronic	
health related	electronic filing and	filing and application of	electronic data at
data using	application of security	security to electronic	and arrangement
computer	to electronic data	data and List methods	Demonstrate
packages		of summarizing data	electronic filing and
		(charts, graphs, tables,	application of some
		histogram)	to electronic data in
			List methods of
			summarizing data
			(charts, graphs,
			tables, histogram)
5.1.2 Analyse health	Generate tables and	Generate tables and	Generate table.
related data	charts from simple	charts from simple	graphs, histograma
using computer	health data using	health data using	and charts from him
packages	spreadsheet	spreadsheet and	health data using
		Generate trends from	spreadsheet and
		data and recognise	generate trends han
	in inn	problems to be solved	data and recognized
		using spreadsheet	problems to be notice
1 2 Don			using spreadshed
5.1.3 Report and	Explain principles of	Explain principles of	Explain principles of
present health	remark Writing HNICAL &	report writing and,	report writing,
related	(University of the Control of the Co	Deduce information	Deduce information
information //	9.0.80×7109	from analysed data and	from analysed data
using compute	3.0.	summarise it	and summarise it all
packages \			generate presentation
	V » DAR ES SA		using computer
1.411-			packages
.1.4 Use computer	Describe importance	Define data backup,	Define data backup,
applications for	of backing up data	Describe importance of	Describe important
data backup,	Explain causes of	backing up data	of backing up data,
information	data loss and	Explain causes of data	Explain causes of data
searching and	describe importance	loss, Classify different	loss,
learning	of computer	type computer viruses	Define a computer
	antiviruses		virus,
		importance of computer	Classify different by
1		antiviruana	

8 . e	5.1 5.1 100 2000 4			antiviruses and Demonstrate techniques in searching information on the internet
	5.1.5 Use computer packages in ordering, invoicing, dispensing, selling and inventory management	List common inventory management applications and Demonstrate procedures for electronic dispensing and carry out management functions using computer.	List common inventory management applications, Demonstrate procedures for electronic invoicing and electronic dispensing and carry out management functions using computer	List common inventory management applications, Demonstrate procedures for electronic ordering, invoicing, electronic dispensing and selling and carry out inventory management functions using computer
	5.2.1 Describe components of the WHO health management information system	Define health management system and List key performance indicators of health management system	Define health management system, List components of the WHO health management system and key performance indicators of health management system	Define health management system, List components of the WHO health management system, Explain the importance of health management system and, list key performance indicators of health management system
	.2.2 Use MTUHA database in capturing and managing pharmaceutical data  2.3 Perform simple	Define MTUHA List commonly used MTUHA tools	Define MTUHA, List commonly used MTUHA tools, Capture and process data using MTUHA database software.  Establish trends of	Define MTUHA, List commonly used MTUHA tools, Capture and process data using MTUHA database software and generate reports from MTUHA database Establish trends of
G R	data anal SISIL FO using 109 UHA database P. O. Bo	services trablems from analyse data	pharmaceutical services from MTUHA database and Identify pharmaceutical services problems from analysed data	pharmaceutical services from MTUHA database, Identify pharmaceutical services problems from analysed data and Prepare reports

5.3.1 Describe the	Define Integrated	Define Integrated	Define Integrale
components of	logistics system,	logistics system,	logistics system
Integrated	List key features of -	Objectives of the ILS	Differentiale but
logistics	the ILS system and	system,	pull and purdi
system	Complete R and R	List key features of the	systems,
ojoto	forms	ILS system, and	Objectives of the
	1011110	Complete R and R	system,
		forms	List key feature
	1)	1011110	ILS system and
			Complete Rand
		ī	forms and Lapland
			ELMS in the
		( <b>4.</b> )	management of
			pharmaceutical
			information
5.3.2 Describe	Mention vertical	Define the term	Define the term vi
management of	programme existing	vertical programme	programme, Monte
pharmaceutical	L 2	and Mention vertical	vertical programm
information in	in the country	programme existing in	existing in the court
vertical		the country	and Explain imput
		the country	of pharmaceulual
programmes	i.	<b>1</b> 5	information
			management in vit
		8 11	programmes
5.3:3 Use networking	Explain the	Explain the	Explain the import
programs in	importance of	importance of	of networking in
disseminating	networking in	networking in	dissemination of
pharmaceutical	dissemination of	dissemination of	pharmaceutical
information.	pharmaceutical	pharmaceutical	information,
information.	information	information and List	List networking
. //	T. FOR THE ROTTICAL &C.	networking	programmes usual in
1	10	programmes used in	dissemination of
1/37	P.O.BOX 7109	dissemination of :	pharmaceutical
12	P.O. 0	pharmaceutical	information and he
Was.		information	Disseminate
	* DAR ES SALAN		pharmaceutical
			information
6.1.1 Describe the	List characteristics of	Define organic	Define organic
concept of	organic compounds	chemistry and List	chemistry,
organic	organio compoundo	characteristics of	List characteristic will
chemistry in		organic compounds	organic compounds.
pharmacy		9	and Explain the
priarriacy	9		importance of organic
		2.2	chemistry in pharman
		1 100 3	
6.1.2 Describe	Classify, Draw and	Classify Draw and	Classify, Draw,
classification of	explain chemical	explain chemical	chemical structures #
organic	structures of organic	structures and	their properties of
compounds	compounds.	nomenclature of	different classes and
	and extension to be admitted to a second to the admitted to a second to a seco		

and their structures		organic compounds	nomenclature of organic compounds.
6.1.3 Describe chemical reactions involving organic compounds	Define term chemical reaction and list types of chemical reactions in organic compounds	Define term chemical reaction and List types of chemical reactions in organic compounds and	Define term chemical reaction, List types of chemical reactions in organic compounds, and Explain chemical reactions in organic compounds
6.2.1 Describe basic structure and functions of plant parts	Explain structure of plant cell and morphology and functions (roots, stem, leaves, flowers, fruits, seeds and barks) of a plant cell Explain plant	Explain structure of a plant cell, functions of plant cell organelles, plant morphology and functions (roots, stem, leaves, flowers, fruits, seeds and barks) of a plant	Explain structure of a plant cell, functions of plant cell organelles ergastic substances, plant tissue and tissue systems, morphology and functions (roots, stem, leaves, flowers, fruits, seeds and barks) of a plant
6.2.2 Describe natural sources of drugs	List sources of drugs and plants commonly used as source of drugs in Tanzania  CIL FOR TECHNICAL  P.O. BOX 7109	List sources of drugs, Explain natural sources of drugs and plants commonly used as source of drugs in Tanzania	List sources of drugs, Explain natural sources of drugs, Explain the importance of plant as a major source of drugs and List available plants commonly used as source of drugs in Tanzania
6.2.3 Explain the importance and use of natural sources of drugs in pharmacy practice	Explaint Economic influences on cultivation of medicinal plants plants	Explain social influences on cultivation of medicinal plants Explain economic influences on cultivation of medicinal plants plants	Explain social influences on cultivation of medicinal plants Explain economic influences on cultivation of medicinal plants List common misuse of medicinal plants
6.2.4 Explain cultivation, distribution, collection and storage of medicinal plants	Classify medicinal plants, List methods for collection medicinal drugs, Explain storage of medicinal plants and	Classify medicinal plants Explain methods used in cultivation of medicinal plants, List factors influencing cultivation of medicinal	Classify medicinal plants, Explain methods used in cultivation of medicinal plants. List factors influencing cultivation of medicinal

				collection medial
Γ			collection modicinal	-
			drugs,	drugs,
			Explain storage of	Explain storage
1			medicinal plants and,	medicinal plunts
	<u>"</u>		Explain adulteration of	List monographs
			crude drugs	medicinal plants
		n *		Explain adulturalle
			1	and evaluation of C
				drugs .
	6.2.5 Explain	Explain the	Explain the	Explain the import
	methods for	importance of	importance of	of processing made
	processing and	processing medicinal	processing medicinal	plants
	extraction of	plants and,	plants,	List methods of
	active	List methods of	List methods of	extraction of could
	medicinal	extraction of crude	extraction of crude	drugs,
1	principals from	drugs	drugs, and	List solvents used la
	natural sources		Explain method of	extraction, and
			drying of crude drugs	Explain method of
				drying of crude data
-	6.2.6 Identify	List plants containing	List plants containing	Classify plants
	medicinal	toxic substances	toxic substances and	containing toxic
i	plants	a	toxic	substances,
	containing toxic	n, m n	elements/principals in	List plants containing
	substances.		medicinal plants	toxic substances and
	odpolario co.	32		toxic
		¥		elements/principals
				medicinal plants
95	6.2.7 Describe active	List uses of active	List sources of active	List sources of a live
	medicinal	principals from	principals from	principals from
	principals from	medicinal plants	medicinal plants	medicinal plants
	natural sources	(alkaloids, glycosides,	(alkaloids, glycosides,	(alkaloids, glyconda
		volatile oils, fixed oils,	volatile oils, fixed oils,	volatile oils, fixed oil
		fats etc.) and,	fats etc.),	fats etc.),
		List sources and uses	List uses of active	List uses of active
		of active principals	principals from	principals from
		from animals	medicinal plants	medicinal plants
		(alkaloids, glycosides,	(alkaloids, glycosides,	(alkaloids, glycosidi
		volatile, oils, fixed oils,	volatile oils, fixed oils,	volatile oils, fixed oils
	1867	fats etc.).	fats etc.), and	fats etc.),
	TOKT	CHONICAL	List sources and uses	List sources and unuit
	Nicil	The state of the s	of active principals	of active principals the
	1/8/	17109 15	from animals	animals (alkaloids,
	7.0.80	1 131:	(alkaloids, glycosides,	glycosides, volatile of
	1131	137	volatile oils, fixed oils,	fixed oils, fats etc.) and List sources and uses
	OAR ES	SALAN SALAN SALAN SALAN SALAN SALAN SALAN SALAN SALAN SALAN SALAN SALAN SALAN SALAN SALAN SALAN SALAN SALAN SA	fats etc.).	of active principals for
	The second secon	and the same of th		
		u		minerals
	6.3.1 Explain the	Explain the	Define isomer,	Define isomer, isomerism, explain the
	concept of	importance of	isomerism, and	importance of
	isomerism	isomerism in	explain the importance	importance or isomerism in
		pharmacy	of isomerism in	pharmacy, list and
		1	pharmacy	ј рпаннасу, постин

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			explain types of isomers.
biotransformati on methods of medicinal products  5.3.3 Describe structure- activity relationship of drugs	Explain metabolism of different organic compounds  Define structure-activity relationship and explain the importance of structure-activity relationship in oharmacy.	Define biotransformation and explain metabolism of different organic compounds  Define structure- activity relationship, explain the importance of structure-activity relationship in pharmacy and, relate organic structures of penicillins, quinolones, cephalosporin and sulphonamides, aspirin and paracetamol	Define biotransformation, explain metabolism of different organic compounds and the importance of biotransformation Define structure-activity relationship, Classify drugs according to their chemical nature, explain the importance of structure-activity relationship in pharmacy and relate organic structures of penicillins, quinolones, cephalosporin and sulphonamides, aspirin and paracetamol.

## 12.0 DESCRIPTION OF MODULES

12.1 Module Title: MEDICINES AND MEDICAL SUPPLIES MANAGEMENT

Module Code: PST 05101
Number of Credits: 12
Sub-Enabling Outcomes

Sub-Enabling Outcomes

- 1.1.1 Describe the purpose of health supply chain management.
- 1.1.2 Describe quantification methods and forecasting of medicines and medical supplies.
- 1.1.3 Describe procurement process of medicines and medical supplies.
- 1.1.4 Explain major procurement agencies for medicines and medical supplies
- 1.1.5 Describe the components of Integrated Logistics system.

Pre-requisite Module: PST 04212: MEDICAL STORES MANAGEMENT FOR THE

# Learning Context:

This module will be conducted through lectures, lecture disciplays, simulation, assignments and practical assignments

## Learning Materials:

Books, Journals, Writing Board, Flip Charts, OHP, Multimedia Projector, Audio visual Key References:

a) MSH and WHO (2012) Managing Access to Medicines and Health Technology, 3<sup>rd</sup> Edition. Kumarian Press

ssion, Greek alsoussid

- b) World Health Organization (WHO), Regional Office for Africa Brazzaville 2004, Management of Drugs at Health Centre Level Training Manual.
- c) United Republic of Tanzania Ministry of Health and Social Welfare, Strategy for Development and Implementation of an Integrated Logistics System for Essential Health

- d) USAID | DELIVER PROJECT, Task Order 1. 2011. Tanzania: 2020 Supply 1 Modeling—Forecasting Demand from 2020–2024. Arlington, Va: USAID | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | DEMAND | PROJECT, Task Order 1.
- e) Ndeki, S. Management of health services, CEDHA, Arusha

12.2 Module Title: LAW AND POLICIES IN PHARMACY PRACTICE

Module Code: PST 05102 Number of Credits: 7 Sub-Enabling Outcomes

- 1.2.1 Explain legislations governing procurement of medicines and medical supplies in the public health facilities.
- 1.2.2 Explain legislations governing procurement of controlled substances
- 1.3.1 Explain national medicines policy in relation to pharmaceutical services
- 1.3.2 Explain policies and guidelines governing procurement of medicines for HIV/AID:
- 1.3.3 Explain policies and guidelines governing procurement of medicines and medicines supplies for vertical programmes.
- 4.3.1 Describe procedures for handling controlled medicines
- 4.3.2 Explain policies governing the handling of prescription only medicines
- Explain legislation governing the handling of controlled medicines

Pre-requisite Module: PST 04208: LAWS AND ETHICS IN PHARAMCY PRACTICE

## Learning Context:

This module will be conducted through lectures, lecture discussion, group discussion, roll plays, simulation, assignments and practical assignments

# Learning Materials:

Books, Journals, Writing Board, Flip Charts, OHP, Multimedia Projector, Audio visual Key References:

a) MSH and WHO (2012) Mana Medicines and Health Technology, Ind Edition. Kumarian Press 1994) Storable

b) Jessop, D and Morrison Prentice Hall

and Supply of Materials, 6th Edition c) MoHSW (2003) Tanzania E.od, Drugs and retics Act, Government Printers Dar 🙉

d) MoHSW (2011), Pharmacy Act, Government Printers Dar es Salaam

- e) United Republic of Tanzania (1971), the drugs and prevention of illicit traffic in drugs and Government Printers-Dar es Salaam
- f) United Republic of Tanzania (2011), Public Procurement Act, Dar es Salaam
- g) MoHSW (2003), The National Health Policy, Government Printers Dar es Salaam
- h) MoHSW (1991), The National Drug Policy, Government Printers Dar es Salaam

# 12.3 Module Title: PHARMACEUTICAL MICROBIOLOGY

Module Code: PST 05103 Number of Credits: 12 Sub-Enabling Outcomes

- 3.1.1 Describe fundamentals principles, concepts and importance of microbiology in pharmacy practice
- 3.1.2 Describe bacteriology, virology, parasitology and mycology of medical and pharmaceutical importance 3.1.3 Describe management of common bacterial vira

- 3.2.1 Explain principles of antisepsis, disinfection and sterilisation
- 3.2.2 Describe conditions requiring antisepsis and disinfection
- 3.2.3 Describe methods and agents used in sterilisation
- 3.4.1 Describe corrcept of immunology and immunization
- 3.4.2 Describe immunological preparations
- 3.4.3 Describe procedures of handling immunological products

#### Pre-requisite Module: None

#### Learning Context:

This module will be conducted through lectures, lecture discussion, group discussion, role plays, simulation, assignments and practical assignments

#### Learning Materials:

Books, Journals, Writing Board, Flip Charts, OHP, Multimedia Projector, Audio visual **Key References**:

- a) Hugo and Russell(2011), Pharmaceutical Microbiology 8th Edition, Willey-Blackwel publications
- b) Aulton M.E and Kevin M.G, Eds: (2013) Pharmaceutics the design and manufacture of medicines,4th Churchill edition Livingstone
- c) Cooper and Gunns Eds (1987) Dispensing for Pharmaceutical Students, 12<sup>th</sup> Ed. CBS Publishers and Distributors; Delhi
- d) Karen C. Carroll et al (2013); Jawetz, Melnick and Adelberg's Medical Microbiology 26<sup>th</sup> Ed. McGraw Hill Co. Inc.
- e) Greenwood et al (2012); Medical Microbiology, 18th edition Churchill Livingstone

## 12.4 Module Title: PHARMACOLOGY AND THERAPEUTICS

Module Code: PST 05104 Number of Credits: 12 Sub-Enabling Outcomes

- 4.1.1 Describe pharmacokinetics of essential medicines
- 4.1.2 Describe pharmacodynamics of essential medicines
- ·4.1.3 Describe side effects, contraindications and adverse reactions of essential medicines

4.1.4 Describe concept of toxicology

Pre-requisite Module: PST 04211: BASIC PHARMACOLOGY

Pre-requisite Module: PST 04211: BASIC PHARM

Learning Context:

This module will be conducted through lectures, lecture discussion, group discussion, role plays, simulation, assignments and practical assignments

P. O. BOX 7109

## Learning Materials:

Books, Journals, Writing Board, Flip Charts, OHP, Multimedia Projector, Audio visual

- a) Foster R.W (1996); Basic Pharmacology, 11th edition, CRC publishers
- b) Tricia M. Berry et al (2009); Clinical Pharmacology made incredibly ease, 3<sup>rd</sup> edition, Lippincort Williams and Wilkins
- c) Laurence D.R, Bennett P.N, Brown J. (2000); Clinical Pharmacology, 8<sup>th</sup> edition, science press
- d) Goodman and Gilman's (2011), The Phamacological Basis of therapeutics, 11th Ed.McGraw Hill

- f) Tripathy/KD, (2013), Essentials of Medical Pharmacology, 7th edition, Jaypee brothers medical Publishers delhi
- g) Heinza et al (2000), Color atlas of Pharmacology, 2nd edition, Thieme Stuttgart
- h) James M.R et al (2008), Textbook of Clinical Pharmacology and Therapeutics, 8th Edition, Hodder Arnold London
- i) Rang, H. P et al (1995), Pharmacology, 3<sup>rd</sup> Edition, Churchill Livingstone

12.5 Module Title: RATIONAL USE OF MEDICINES

Module Code: PST 05105 Number of Credits: 4 Sub-Enabling Outcomes

- 4.2.1 Describe causes of irrational use of medicines and associated problems.
- 4.2.2 Explain essential medicines concept in promoting rational use of medicines.
- 4.2.3 Explain the role of drug marketing and promotions in supporting rational use of medicines.

Pre-requisite Module: None

## Learning Context:

This module will be conducted through lectures, lecture discussion, group discussion, role plays, simulation, assignments and practical assignments

#### Learning Materials:

Books, Journals, Writing Board, Flip Charts, OHP, Multimedia Projector, Audio visual

## Key References:

- a) MSH and WHO (2012) Managing Access to Medicines and Health Technology, 3<sup>rd</sup> Edition.
   Kumarian Press
- Kathleen Holloway and Terry Green (2003), Drug and therapeutic committee A practical guide, W.H.O Geneva
- c) Standard Treatment Guidelines and National Essential Medicines List (2007)

d) AMREF (2007) Distance Education Programme: Duge management and rational Use, Nairobi.

12.6 Module Title: PHARMACEUTICAL ORG

Module Code: PST 05106

Number of Credits: 12 Sub-Enabling Outcomes

- 6.1.1 Describe the concept of organic chemistry in pharmacy
- 6.1.2 Describe classification of organic compounds and their structures
- 6.1.3 Describe chemical reactions involving organic compounds
- 6.3.1 Explain the concept of isomerism
- 6.3.2 Explain biotransformation methods of medicinal products
- 6.3.3 Describe structure-activity relationship of drugs

Pre-requisite Module: None

Learning Context:

#### Learning Materials:

Books, Journals, Writing Board, Flip Charts, OHP, Multimedia Projector, Audio visual

#### Key References:

- a) Ternay, A.L (1976) contemporary Organic Chemistry, W.B. Saunders Co. Philadelphia
- b) Morrison R.T and Boyd R N (1997) Organic chemistry, 6th Edition, Prentice Hall of India, New Delhi
- c) Graham Solomon et al (2014), Organic Chemistry, 11<sup>th</sup> Edition, John Willey and Sons
- d) Rama Rao Nadendla (2005); Principles of Pharmaceutical Organic Chemistry, MacMillan India
- e) Bruice Y (2014); Organic Chemistry, 7th edition Prentice Hall
- f) Wilson L., Gillson M (); Medicinal Chemistry, Lippincott Williams, Calfornia
- g) Bhassin S.K, Gupta R.(2013), Pharmaceutical organic chemistry, Kindle edition, Elsevier Health sciences

#### 12.7 Module Title: QUALITY ASSURANCE OF PHARMACEUTICAL PRODUCTS

Module Code: PST 05207

Number of Credits: 12

#### **Sub-Enabling Outcomes**

- 2.1.1 Explain the principles of Good Manufacturing Practices.
- 2.1.2 Explain components of Good Manufacturing Practices.
- 2.1.3 Describe quality control and assurance in relation to preparation of pharmaceutical products
- 2.3.1 Explain standard operating procedures of equipment and machines in facility-based pharmaceutical preparation unit
- 2.3.2 Explain the operating principles of equipment and machines in facility-based pharmaceutical preparation unit.
- 2.3.3 Explain preventive maintenance procedures for equipment and machines in facility-based pharmaceutical preparation unit
- 3.3.3 Describe procedures for quality testing of pharmaceutical products.

Pre-requisite Module: None

Learning Context:

This module will be conducted through lectures declared discussion, role plays, simulation, assignments and practical assignments and practical assignments.

P. O. BOX 7109

#### Learning Materials:

Books, Journals, Writing Board, Flip Charts, OHP, Multimedia Projector, Audio visual

- a) British Pharmacopoeia (2014)
- b) United States Pharmacopoeia (2014)
- c) International Pharmacopoeia (2014)
- d) Cooper and Gunns, Editors (1987) Dispensing for Pharmaceutical Students, 12th Ed. CBS Publishers and Distributors: Delhi

- f) Lund, W. Editor (1994) The Pharmaceutical Codex, Principles and Practice of Pharmaceutics 12th Edition: The Pharmaceutical Press, London
- g) Rawlins E.A, Editor: 1977 Bentley's Textbook of Pharmaceutics, 8th Ed. Baillie're Tindall London
- h) Kamm, G., Kohler B. Editors (1995); Manual for Decentralized Infusion Production, Infusion Unit Project Tanzania
- The design and manufacture of Medicinos i) Aulton M.E et al (2013), Pharmaceutics: 4th edition: Churchill Livingstone, Edinburgh
- j) Gennaro, R. A, et.al (eds) 1990 Remington's 'Pharmaceutical Sciences 18th edn: Modif Publishing Company, Easton, Pennsylvania 18042
- k) Shayne C et al(2008), Pharmaceutical Manufacturing handbook Production and processes: John Wiley & Sons

12.8 Module Title: PHARMACEUTICS THEORY AND COMPOUNDING

Module Code: PST 05208 Number of Credits: 20 **Sub-Enabling Outcomes** 

- Describe sterile pharmaceutical preparations
- Describe requirements for preparation of sterile pharmaceutical products 2.2.2
- Use formula in the preparation of pharmaceutical products 2.2.3
- 2.2.4 Describe formulation of semi-solid pharmaceutical preparations
- 2.2.5 Perform calculations on isotonicity, electrolytes, constitutions, intravenous admixtures and rate of flow.
- Explain concepts of preserving pharmaceutical products 3.3.1
- Describe agents used in preservation of pharmaceutical products 3.3.2

Pre-requisite Module: PST 04209: COMPOUNDING OF PHARMACEUTICAL LIQUII) **PROPARATION** 

This module will be conducted through lectures, Pecture discussion, group discussion, role plays, simulation, assignments and practical assignments

Learning Materials:

Books, Journals, Writing Board, Flip Charts, OHP, Multimedia Projector, Audio visual

- a) Cooper and Gunns, Editors (1987) Dispensing for Pharmaceutical Students, 12th Ed CBS Publishers and Distributors; Delhi
- b) Cooper and Gunns, Editors (2005) Tutorial Pharmacy, 12th Ed. CBS Publishers and Distributors; Delhi
- c) Liebsch, B et al (1988): Tanzania Pharmaceutical Handbook, Dar es Salaam University Press.
- and Practice of d) Lund, W. Editor (1994) The Pharmaceutical Codex, Principles Pharmaceutics 12th Edition: The Pharmaceutical Press, London
- e) Rawlins E.A, Editor: 1977 Bentley's Textbook of Pharmaceutics, 8th Ed. Baillie're Tindall. London Kamm, G. and Kohler, B. Editors: 1995 Manual for Decentralized Infusion Production, Infusion Unit Project Tanzania
- f) Aulton M.E ed (2013), Pharmaceutics: The design and manufacture of Medicines,

- h) Shayne C et al(2008), Pharmaceutical Manufacturing handbook Production and processes: John Wiley & Sons
- i) Howard C Ansel (2010), Pharmaceutical calculations, 13th Edition: Lippincott Williams & Wilkins London.
- i) Stocklosa MJ, pharmaceutical calculations, Williams & Wilkins London
- k) Senya, S, et al (2011): Tanzania Pharmaceutical Handbook, School of Pharmaceutical Sciences- MUHAS.
- l) Liebsch, B et al (1988): Tanzania Pharmaceutical Handbook, Dar es Salaam University Press.
- m) Marriot et al (2010), Pharmaceutical Compounding and Dispensing, 2nd edition, Pharmaceutical Press
- n) Loyd V. Allen (2005); The art and science of pharmaceutical compounding, 2nd edition, APhA Publications.
- o) B. Peter, et al (2012), Dermatological Preparations for the Tropics, 2nd edition, Beta Science Shop, University of Groningen, The Netherlands\
- p) Lund, W. Editor (1994): The Pharmaceutical Codex, 12th Edition. Pharmaceutical Press, London.
- q) Martindale the complete drug reference (2014), Pharmaceutical Press
- r) British Pharmaceutical Handbook (2015), Pharmaceutical Press
- s) United State Pharmacopoeia NF (2014), United States Pharmacopeial Convention
- t) International Pharmacopoeia
- u) European Pharmacopoeia

12.9 Module Title: HEALTH INFORMATION MANAGEMENT

Module Code: PST 05209 Number of Credits: 12 Sub-Enabling Outcomes

- 5.1.1 Organize health related data using computer packages
- 5.1.2 Analyse health related data using computer packages
- 5.1.3 Report and present health related information using computer packages
- 5.1.4 Use computer applications for data backup, information searching and learning
- 5.1.5 Use computer packages in ordering, invoicing, dispensing, selling and inventory management
- 5.2.1 Describe components of the WHO THE HARD THE Information system
- 5.2.2 Use MTUHA database in capturing and managing pharmaceutical data
- 5.2.3 Perform simple data analysis using MTWH database
- 5.3.2 Describe management of pharmaceutical information in vertical programs.
- 5.3.3 Use networking programs in discerning the pharmace utical information.

Pre-requisite Module: PST 04107: BASIC COMPUTER APPLICATIONS

#### **Learning Context:**

This module will be conducted through lectures, lecture discussion, group discussion, role plays, simulation, assignments and practical assignments

## Learning Materials:

Books, Journals, Writing Board, Flip Charts, OHP, Multimedia Projector, Audio visual

- c) United Republic of Tanzania Ministry of Health and Social Welfare, Strategy for Development and Implementation of an Integrated Logistics System for Essential Health Commodities: Government printers, Dar es Salaam
- d) USAID | DELIVER PROJECT, Task Order 1. 2011. Tanzania: 2020 Supply Chaln Modeling—Forecasting Demand from 2020–2024. Arlington, Va.: USAID | DELIVER PROJECT, Task Order 1.
- e) International Council on Archives (1999), Managing Public sector records, Understanding computers an over view for records and archives: International Records Management Trust London
- f) Microsoft, introduction to Microsoft office 10.

12.10 Module Title: BASIC PHARMACOGNOSY

Module Code: PST 05210 Number of Credits: 12 Sub-Enabling Outcomes

- 6.2.1 Describe basic structure and functions of plant parts
- 6.2.2 Describe natural sources of medicines
- 6.2.3 Explain the importance and use of natural sources of medicines in pharmacy practice
- 6.2.4 Explain cultivation, distribution, collection and storage of medicinal plants
- 6.2.5 Explain methods for processing and extraction of active medicinal principals from natural sources
- 6.2.6 Identify medicinal plants containing toxic substances.
- 6.2.7 Describe active medicinal principals from natural sources

Pre-requisite Module: None

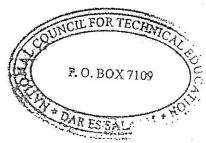
# Learning Context:

This module will be conducted through lectures, lecture discussion, group discussion, role plays, simulation, assignments and practical assignments

# Learning Materials:

Books, Journals, Writing Board, Flip Charts, OHP, Multimedia Projector, Audio visual

- a) Trease and Evans (2009); Pharmacognosy, 16th Edition: Saunders, London
- b) Joanne Barnes et al (2002), Herbal medicines 3rd Edition: Pharmaceutical Press
- c) Wallis T.E, Textbook of Pharmacognosy, CBS publishers and distributors, Oxford
- d) Robberss J.E, Speedie M.K, Pharmacognosy and Pharmacobiotechnology, warvelly company Baltimoere.
- e) Henrich M. (2012); Fundamentals of pharmacognosy and phytotherapy, Churchill Livingstone



- h) Shayne C et al(2008), Pharmaceutical Manufacturing handbook Production and processes: John Wiley & Sons
- i) Howard C Ansel (2010), Pharmaceutical calculations, 13th Edition: Lippincott Williams & Wilkins London.
- j) Stocklosa MJ, pharmaceutical calculations, Williams & Wilkins London
- k) Senya, S, et al (2011): Tanzania Pharmaceutical Handbook, School of Pharmaceutical Sciences- MUHAS.
- I) Liebsch, B et al (1988): Tanzania Pharmaceutical Handbook, Dar es Salaam University Press.
- m) Marriot et al (2010), Pharmaceutical Compounding and Dispensing, 2nd edition, Pharmaceutical Press
- n) Loyd V. Allen (2005); The art and science of pharmaceutical compounding, 2nd edition, APhA Publications.
- o) B. Peter, et al (2012), Dermatological Preparations for the Tropics, 2nd edition, Beta Science Shop, University of Groningen, The Netherlands\
- p) Lund, W. Editor (1994): The Pharmaceutical Codex, 12th Edition. Pharmaceutical Press, London.
- q) Martindale the complete drug reference (2014), Pharmaceutical Press
- r) British Pharmaceutical Handbook (2015), Pharmaceutical Press
- s) United State Pharmacopoeia NF (2014), United States Pharmacopeial Convention
- t) International Pharmacopoeia
- u) European Pharmacopoeia

12.9 Module Title: HEALTH INFORMATION MANAGEMENT

Module Code: PST 05209 Number of Credits: 12 Sub-Enabling Outcomes

- 5.1.1 Organize health related data using computer packages
- 5.1.2 Analyse health related data using computer packages
- 5.1.3 Report and present health related information using computer packages
- 5.1.4 Use computer applications for data backup, information searching and learning
- 5.1.5 Use computer packages in ordering, invoicing, dispensing, selling and inventory management
- 5.2.1 Describe components of the WHO THE HARD MAIN Information system
- 5.2.2 Use MTUHA database in capturing and managing pharmaceutical data
- 5.2.3 Perform simple data analysis ing MTUHA database
- 5.3.2 Describe management of pharmaceutical information in vertical programs.
- 5.3.3 Use networking programs in disterning pharmaceutical information.

Pre-requisite Module: PST 04107: BASIC COMPUTER APPLICATIONS

## Learning Context:

This module will be conducted through lectures, lecture discussion, group discussion, role plays, simulation, assignments and practical assignments

## Learning Materials:

Books, Journals, Writing Board, Flip Charts, OHP, Multimedia Projector, Audio visual

Key References:

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