A TECHNICAL REPORT

ON

STUDENT INDUSTRIAL WORK EXPERIENCE SCHEME

AT

MINISTRY OF HEALTH ILORIN KWARA STATE

BY

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ND/23/SLT/PT/0390

PRESENTED TO THE

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CERTIFICATION

This is to certify that this report of SIWES program for the 2023/2024 session is written and submitted by **JOSHUA TEMITOPE** with matriculation number **ND/23/SLT/PT/0390** to the department of SCIENCE LABORATORY TECHNOLOGY (SLT), Kwara state Polytechnic, Ilorin.

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Student signature Date

_____ _____

SIWES Coordinator Signature Date

DEDICATION

This work is first dedicated to God almighty for his immeasurable love and faithfulness upon my life throughout my period of Industrial Training. This work is also dedicated to my entire family especially my parent Mr. and Mrs HAPPYJOE for their care, love, and provision.

ACKNOWLEDGEMENT

I sincerely offer priceless and invaluable gratitude to the Almighty God for his boundless love and mercy upon me throughout the period of my industrial training. I am most grateful to my parents Mr. and Mrs JOSHUA for their financial and moral support throughout the period of my Industrial Training. Not left out my siblings, friends and loved ones especially my brother future and favor. I love you all. My profound gratitude goes to the managements, staff and my fellow industrial Trainee. Finally I want to say a big thank you to my HOD, all my lecturers, the Kwara state polytechnic, Ilorin. And every other person that has been helpful during the period of my Industrial Training. I say may God bless you all beyond measures amen.

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CHAPTER ONE

1.1 INTRODUCTION

SIWES was purposely introduced in order to make student acquire more knowledge or skills about a methods of some professional work and to exposed them to the used of some equipment in the programme and also to help the students on how setup and safeguard their own industry and or organization in future.

1.2 AIMS AND OBJECTIVE OF SIWES

1. It expose the student to some equipment which are not available in school.
2. SIWES programme prepare students for the work situation they are likely to meet after graduation from school.
3. It enables student to be self-dependent not only on the theoretical aspects but also on practical aspects in the field of study.
4. It also helps to know the general safety precautions, rules and regulations of on organization or establishment.

- Brief History of the Ministry of Health, Ilorin
- The Ministry of Health, Ilorin, is a governmental body responsible for planning, implementing, and regulating healthcare services in Kwara State. It oversees healthcare policies, disease control programs, public health initiatives, and the management of hospitals and clinics. The Ministry collaborates with federal health institutions, non-governmental organizations (NGOs), and international agencies to enhance the delivery of healthcare services.

- The Ministry is divided into several departments, including:
- Public Health and Sanitation
- Medical Laboratory Services
- Pharmaceutical Services
- Nursing and Midwifery
- Administration and Records Management.

Services

Facilities and Equipment

1.4 Scope of SIWES at the Ministry of Health

The scope of the SIWES program at the Ministry of Health included training in the following areas:

Public health education and disease prevention campaigns.

Basic laboratory procedures and diagnostic techniques.

Pharmacy operations, including drug dispensing and stock management.

Medical record-keeping and data management.

Exposure to hospital administration and policy implementation.

Training and Research

PRIMARY HEALTH CARE is a major teaching hospital that provides training to medical students, resident doctors, and other healthcare professionals. The hospital also conducts research in various areas of medicine, including infectious diseases, non-communicable diseases, and healthcare systems.

CHAPTER TWO

2.1. DESCRIPTION OF THE ORGANIZATION

2.1 Structure of the Ministry of Health

The Ministry of Health is structured into several directorates, each responsible for different aspects of healthcare management:

1 Directorate of Public Health: Manages disease prevention, immunization, and public health campaigns.

2 Directorate of Hospital Services: Oversees hospitals, medical facilities, and healthcare regulations.

3 Directorate of Pharmaceutical Services: Regulates drug distribution and ensures compliance with national pharmaceutical laws.

4 Directorate of Nursing Services: Monitors nursing and midwifery practices.

5 Directorate of Laboratory Services: Handles diagnostic and medical testing.

6 Directorate of Administration and Finance: Manages human resources, budgets, and logistics.

2.2 Roles and Responsibilities of the Ministry

The Ministry of Health in Ilorin is responsible for:

I. Formulating healthcare policies and programs.
II. Managing hospitals and healthcare institutions in the state.
III. Implementing public health campaigns and disease control programs.
IV. Regulating healthcare professionals and medical facilities.
V. Conducting research on prevalent health issues.
VI. Collaborating with local and international health agencies.

2.3 Facilities and Equipment

The Ministry of Health is equipped with:

Diagnostic laboratories for medical tests and research.

Public health units for immunization and disease surveillance.

Pharmaceutical stores for drug supply and distribution.

Administrative offices for policy-making and records management**.**

3. PARASITOLOGY SECTION: This is the unit where clinical specimens are analyzed in search for parasitic organisms. The clinical specimens analyzed include stool, urine analysis.

4. HEMATOLOGY: This section is concerned with Hemoglobin (blood penalty test), FBC, malaria test, HB-genotype, ABO groups, Erythrocytes Sedimentation Rate [ESR TEST]

5. CHEMISTRY SECTION: This section is concerned with cholesterol, FBS and RBS, Lipid profile etc.

6. MICROBIOLOGY SECTION: Deals with urine, stool, HVS (urine Swab), urethral,

2.2 LABORATORY RULES AND REGULATIONS

i. Laboratory coat and hand gloves should be worn in the laboratory
ii. Eating, drinking, smoking and dancing should be avoided in the laboratory
iii. Hands should be washed after handling a sample and when leaving the laboratory
iv. All benches should be cleaned before and after the day work.
v. Avoid being bare footed, cover shoes should be worn in the laboratory
vi. Hairs should be covered with Hair net.
vii. Fingers and nails should be cut short
viii. Labeling of sample should be done with care

2.3 LABORATORY EQUIPMENTS AND THEIR USES MICROSCOPE

This equipment is used of the examination of samples and magnification of microorganisms that cannot be seen with the naked eyes. Its parts include object lens which havel00x, 40x, and l0x objective lenses other parts are fine and coarse adjustment knobs

AUTOCALVE: This is used in sterilsation of glass wares and media used in the laboratory to avoid contamination. It consists of chamberson which the articles are placed and treated with steam At high pressure.

INCUBATOR: It is used for incubating cultured plate for 24 hours -48 hours at the temperature between 37oc-4000c so as to obtain proper growth of microorganisms.

LABORATORY OVEN: It is used for sterilization of Meta wares and also for preservation.

CENTRIFUGE: It is used for sedimentation of particles, is used in separating components of different densities in a liquid, using centrifugal force.

WEIGHING BALANCE: This is used for measuring mounts of substance required for analysis which measure in grams.

ELECTROPHORESIS MACHINE: It is used for carrying out test on genotype.

REFRIGERATOR: This is for the preservation of samples. HAEMATOCRITE CENTRIFUGE this is used for sampling blood with microhaeamatocrit capillary tubes to know the blood percentage of an individual

SYRINGE: They are used to give injection and also for collection of blood sample through venous blood collection in the lab for laboratory practical.

2.4 HAEMATOLOGY TEST: This is the test used in carrying out the investigation of anemia, infection and pyrexia 9 fever) of unknown origin, investigation heamoglobinopathics and monitoring patients receiving antiretroviral therapy (ART).

2.5 BLOOD GROUP: This is all ABC blood group system are clinically the most important. Blood group donors and patients must be grouped correctly to avoid the death of the patients when the ABC is incompatible. The ABC blood group w have :AB ,AB ,A, K ,B+,B,O+,0 AIM: The aim is to determine a patient's blood group Apparatus: Anti sera A,B, and C clean and dry title applicators, sterile blood lancet, sterile swap and hand glove.

TECHNIQUES: After a patient thumb has being cleaned with sterile swap and allow to dry, a puncture is made with the lancet and the first drop of the blood is cleaned off. And then pressed to get another drop of blood which is dro oped at three division on a tile. Add one volume of the respective anti-sera A B and 0 to th e bloodsamplesUsing applicators mix the anti-sera with the blood respectively Rock for 2-3 minutes and then record your result.

2.6 ORGANIZATIONAL CHART OF THE COMPANY

1 Instant Messaging: One-on-one and group chats for quick discussions.

2 Departmental Channels: Dedicated channels for specific health units.

3 File & Document Sharing: Secure sharing of reports, guidelines, and medical data.

4 Video & Voice Calls: Virtual meetings for better engagement.

5 Integration with Health Systems: Connectivity with databases, electronic health 6 6 6 6 records (EHRs), and emergency response platforms.

7 End-to-End Encryption: Ensuring data privacy and security.

2.7 PRECAUTION TAKEN IN THE MEDICAL LABORATORY

1. Always wear a laboratory coat when working in the laboratory.
2. Ensure wearing of disposable glove when carrying out any test in the laboratory.
3. Do not eat, drink or smoke whenever you are in the laboratory.
4. Always wash your hand before and after any test.
5. The laboratory must be well ventilated.
6. Handle all laboratory apparatus with care.
7. All needles and any other sharp object must be properly disposed.
8. Every sample must be corked and well labeled for easy identification.
9. The book of record must be kept properly.
10. There must not be any naked wire in the laboratory.
11. There must be a proper waste segregation in the laboratory.
12. There must be a fire extinguisher in the laboratory.

2.8 INTRODUCTION TO MEDICAL LABORATORY APPARATUS

Some apparatus used in medical laboratory are as follow:

- GLUCOMETER:- A glucometer is a medical devices used to determine the approximate concentration of glucose in the blood of a particular patient.
- CENTRIFUGE:- this is a machine or an instrument used for hasting sedimentation of samples. E.g. blood, urine etc.

ELECTROPHORESIS:- This is one of the apparatus used for the determination of genotype.

- RUBBER PIPETTE:- This is used for picking samples such as blood, sperm etc.
- PLASTICINE:- It is used to seal one of a capillary tube.
- LANCET:- This is used to prick patients thumb for collection little blood sample.
- SLIDE:- This is used when carrying out experiment under microscope in which sample is put on it to view under microscope.
- STIRRER:- It is used to mixed sample and reagent together.
- WIRE LOOP:- It is used for fixing culture.
- TOURNIQUET:- It is used to tight arm in other to view the prominent vein before collecting the blood sample.
- HAND GLOVES:- It is used during experiment in the medical laboratory to prevent infections.
- SWAB:- It is used to disinfect the area where sample will be collected
- EDTA BOTTLE:- It is a prepare bottle used to keep blood from clothing before the test is done.
- UNIVERSAL BOTTLE:- It is used to collect sample from patients such as urine, sperm etc
- MICROSCOPE:- This is an instrument used to view minutes organisms that can not be seen with the naked eyes.
- SYRINGE/NEEDLE:- An instrument (for the injection of medicine or withdrawal of bodily fluids) that consist of a hollow barrel fitted with a plunger and a hollow needle.
- MEASURING CYLINDER:- A graduated cylinder or mixed cylinder is a common piece of laboratory equipment used to measure the volume of a liquid.
- EST-TUBE:- A thin glass tube closed at one end, used to hold small amounts of material for laboratory testing or experiments.

CHAPTER THREE
SIWES ACTIVITIES AND LEARNING EXPERIENCES

3.1 Assigned Duties and Responsibilities

During my SIWES training, I was assigned to different units within the Ministry, where I gained exposure to various healthcare services. My key responsibilities included:

Assisting in the collation and maintenance of medical records.

Observing and participating in laboratory diagnostic tests.

Assisting in the distribution of pharmaceutical supplies.

Participating in public health awareness programs on disease prevention.

Assisting in patient care and administrative documentation.

3.2 Practical Experiences and Observations

Some of the key lessons learned during my SIWES training include:

The importance of accurate and systematic medical record-keeping.

Hands-on experience in laboratory tests, including blood sample collection and analysis.

Understanding pharmacy operations, drug dispensing, and stock management.

The role of immunization in disease prevention and public health improvement.

Exposure to the importance of teamwork and communication in healthcare settings.

3.3 Challenges Encountered

Some of the challenges I faced during my training included:

Limited access to advanced medical procedures due to regulatory restrictions.

The high workload in administrative departments.

Occasional power outages affecting laboratory operations.

Adjusting to the fast-paced work environment of a healthcare facility.

3.4 Solutions and Adaptations

To overcome these challenges, I:

Sought mentorship from experienced professionals in the Ministry.

Improved my time management skills to handle administrative tasks effectively

Adapted to manual methods of record-keeping during power outages.

Engaged in self-learning to supplement my practical exposure.

3.5 PACKED CELL VOLUME (P.C.V)

P.C.V packed cell volume- it can be define as the volume of blood in a whole sample. That's the level of blood in the body of patient.

MATERIAL NEEDED

Heparinised tube, swab cotton wool, lancet, centrifuge machine, haematocrite readers, plastene.

PROCEDURE FOR PACKED CELL VOLUME

- Prick the finger with lancet to obtain a flow of blood.
- Use the heparinised tube to filed it up the blood to the end.
- The swab cotton wool is used to clan up the pricking finger.
- Seal the end of the heparinised with plastene.
- Then put into centrifuge bucket machine.
- Spin at 10,000 rpm for 2 to 5mins.
- After spinning down the sample
- Remove and read the result in the haematocrit reader.

NORMAL RESULT

Men = 44-56%

Women = 37 – 47%

Infant = 54-62%

3.2 BLOOD GROUPING

MATERIAL NEEDED

Blood sample, antisera, titre, pipette, swab cotton wool, syringe and needle.

PROCEDURE FOR BLOOD GROUPING

- The blood is collected into a chemically clean test tube that contain EDTA Bottle.
- The blood is mix together thoroughly
- A drop of blood is put into a slide in three places
- Then add the antiseras on each blood
- Mix together to obtain your result

RESULT

‘A-positive

‘B’-positive

‘AB’– positive

‘D’– positive

‘D’– Negative

- ‘O’ Rh D+ve is the universal donor that gives blood at all the groups.

While

- ‘O’ Rh D-ve are our rhesus factors these group O-ve did not collect blood from anybody except only the group.

3.6 MALARIA PARASITE TEST (MP TEST)

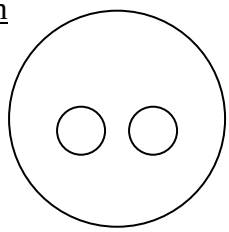
MATERIAL NEEDED: Clean glass slide, coverslip, blood sample, microscopy H_20, leishman staining, lancet, swab cotton wool.

PROCEDURE FOR MALARIA PARASITE

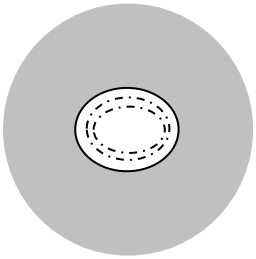
- You prick the finger of the patient with lancet.
- A drop of blood is placed on a clean glass slide and clean the finger with swab cotton wool.
- A clean cover slip is used to spread the blood in order to make a thin smear and to obtain tail edger.
- The slide with leishman staining and leave for 2minutres to allow the parasite to fix.
- Then double dilute with water
- Leave for 8minutes
- Remove the water and allow the slide to air dry apply oil immersion and examine under the microscope using x100 objectives.

TYPES OF MALARIA PARASITES

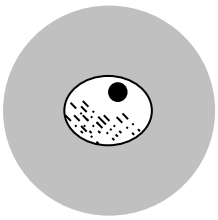
(1) Plasmodium falciparum



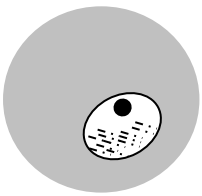
14(2) Plasmodium ovale



(3) Plasmodium malariae



(4) Plasmodium vivax



Plasmodium vivax

3.8 HUMAN IMMUNE VIRUS (HIV TEST)

MATERIALS NEEDED FOR LEME-VIRAL TEST/SCREENING TEST

TYPES OF KIT

- Global kit
- Determined kit
- Stat-pak kit
- Screening kit, buffer water, blood sample, centrifuge bucket machine, swab cotton wool, syringe and needle, test, HIV buffer kit.

PROCEDURE FOR HUMAN IMMUNE VIRUS

- 2mls of blood of the patient is converted into EDTA bottle.
- It is spin down at 10,000 rpm for 2mins to obtain fine serum.
- The serum is pipette and a drop of serum is drop into the global kit to run.
- Leave for 5minutes to allow the test to develop.

RESULT

- If there is one band that means its negative
- But if there is two band it is positive for type 1.
- When there is three red band + it is positive for Type 1 and type II - that is positive
- Sample drop

T – Stand for test

C – Stand for control

3.9 PREGNANCY TEST

We have urine pregnancy test and blood pregnancy test. The difference between the two are: in urine test when pregnancy is between two weeks or three weeks after doing the pregnancy urine test accidentally the result may not developed while the blood is used for the further investigation which we give us the normal result. If positive or negative

MATERIAL NEEDED

Urine sample, universal bottle, HCG strip

PROCEDURE FOR PREGNANCY TEST

- The urine is collected into a chemically clean bottle.
- Then the strip is put deeply into the urine to obtain a result.
- They move from the end at least for 2minutes
- To allow the colour to develop

- Remove to read the result

RESULT

- If there is one red blood – negative
- If there is two red band means – positive

  That is the patient is pregnant

3.1.0 URINALYSIS TEST

This is a test carried out to detect the rate of some component present in the urine. It is used to know the physical, chemical properties of the patient's urine.

Apparatus: Urinalysis strip (Combi 2,9 &10), hand gloves plane universal bottle, toilet roll, stop clock.

Regent: Patient's urine.

Procedures:

- ❖ Put on hand gloves.
- ❖ Give the plane universal bottle to the patient to bring his/her urine.
- ❖ Examine the urine physically from the universal bottle.
- ❖ Bring out one of the strip from the Combi.
- ❖ Insert it into urine sample.
- ❖ Place the strip immediately you remove it from the urine on tissue paper in order to get rid of excess urine from the black of the strip.
- ❖ Read the result within 30 seconds to 60 seconds.
- ❖ Record your result.

Physical Examination of Urine

1. Check for color: Normal urine is slightly yellow or amber.
2. Check for odour: Uninfected urine is slightly aromatic.
3. Urine sample must be transparent.

Chemical Properties of Urine

This indicates any abnormality present in the urine sample. The chemical component/properties using Combi 10 includes: blood, urinobilinogen, bilirubin, protein, nitrite, ketones, glucose, PH, specific gravity, leukocytes.

Precautions

- ❖ Check for the expiring date of the strip used.
- ❖ Put on hand gloves.
- ❖ Bring out the only strip needed.
- ❖ Handle the urine sample carefully.

- ❖ Read the result within the normal time.

3.11 WIDAL TEST

This is use for investigation of typhoid fever, this is caused by salmonella typhi. This is a test presumptive serological test for enteric fever or undulant fever whereby bacterial causing typhoid fever care missed with serum (containing specific antibody obtained from infected individual.

SAMONELLA INFECTION

Test result need to interpreted carefully in the light of past history of enteric fever, typhoid vaccination and the general level of antibodies in the population.

WIDAL TEST PROCEDURE

- Collection of blood sample from a patient.
- Allows the blood to settle to form a serum.
- Put the serum inside a small straight bottle.
- Prepare a plate which contain four, four rows.
- Prepare the antiseral
- A drop of each antiseral should be drop on a each hole and plate.
- Then draw a drap of serum with pipette on each antiseral on the plate
- Mix both the antiseral and the serum together.
- View with your eyes if positive or negative by checking of agglutination or non.

NOTE: If agglutination occurs, it is positive

If non agglutination it is negative.

3.12 VENERAL DISEASE RESEARCH LABORATORY

This test is for syphilis. It measure substance called antibodies. That your body may produce if you have come in contact with the bacteria that cause SYPHILIS. This bacteria is called Treponema Pallidium.

- **Syphilis:** This is a sexual transmitted in reaction causes by the spirocliaela bacterium treponema palladium.

CHAPTER FOUR

4.1 CONCLUSION

The student industrial work experience scheme (SIWES) helps students to expand their knowledge and experience in their field of study. It will also help student whenever they come across it in future career.

4.2 RECOMMENDATION

I wish the government and the school authority to provide necessary materials for the students during this programme. They should also try to pay the students allowance so as to serve as help for the students in one way or the other.

Also, the supervisors should make sure they visit the students in their place's of attachment for proper monitoring, improvement and progress for the benefit of the societies as a whole.