A TECHNICAL REPORT
STUDENT INDUSTRIAL WORKING EXPERIENCE SCHEME (SIWES)

Held at

GRACE AND GLORY MEDICAL LABORATORY
EJIGBO OSUN STATE

Prepared by:

ORE PRECIOUS OMOWUMI
ND/23/SLT/FT/0068

SUBMITTED TO

DEPARTMENT OF SCIENCE LABORATORY TECHNOLOGY
INSTITUTE OF APPLIED SCIENCE
KWARA STATE POLYTECHNIC, ILORIN

INPARTIAL FULFILLMENT OF THE AWARD OF THE REQUIREMENT OF THE AWARD OF NATIONAL DIPLOMA IN SCIENCE LABORATORY TECHNOLOGY (SLT)

Sept., – Dec., 2024

TABLE OF CONTENTS

Title Page
Table of Contents **1**
Chapter One
1.0 Introduction to SIWES 2
1.1 Background of SIWES 2
1.2 Objectives of SIWES 3
Chapter Two
2.0 Safety Laboratory Practices 3
2.1 Equipments and Machines used in the laboratory 4
2.2 Gram staining technique 5
2.3 Sensitivity test 5
Chapter Three
3.0 Microbiology & Parasitology 7
3.1 Preparation of MacConkey Agar 7
3.2 Preparation of Cled Agar 7
3.3 Preparation of Blood Agar 8
Chapter Four
4.0 Swab Processing Bench 9
4.1 Urine rest analysis 9
4.2 Parasitology bench 11
4.3 Special pathogens 12
4.4 Serology bench 13
4.5 Constituents & Uses of Dilution fluid 16
4.6 Processing of cerebrospinal fluid 17
4.7 Sexually Transmitted Infection 18
4.8 Sensitivity and Biochemical Test 19
Chapter Five
5.1 Relevance of the SIWES Program 20
5.2 Advice to the Organization 20
5.3 Advice to the Institution 20
5.4 Advice to the Students 20

CHAPTER ONE

1.0 INTRODUCTION TO SIWES

Student Industrial Work Experienced Scheme (SIWES) was established to solve the problem of lack of adequate practical skills needed for employment industries by Nigeria graduates of higher institutions (especially Polytechnic ND I – ND II students) in order to improve the theoretical knowledge of students.

SIWES is said to be a technical skills and acquisition of knowledge from the organization. It is well a motive that complements the learning which student have acquired in the class room theoretically.

More so, this Industrial Training helps the students to gain more knowledge through detailed observation made through practical works with identifiable machines for analyzing of phenomena within the vicinity of the area studied.

However, **SIWES** exposes students to base on skills necessary for a smooth transition from the class room to the world. It provides student of higher institutions the opportunity of being familiarized to the experienced in handling machinery and equipment which are usually not available in the educational institutions.

In other words, it was established to promote and encourage the acquisition of skill in industry and commerce with a few of generating manpower sufficient to meet the needs of Nigeria economy.

1.1 BACKGROUND OF SIWES

The Student Industrial Work Experience Scheme (SIWES) was introduced by the Federal Government of Nigeria in 1973. It is an accepted skills training program which forms part of minimum academic standards in the various degree program for all Nigeria tertiary institutions. It is an effort to bridge the gap existing between theory and practical of engineering and technology, science, agriculture and other professional educational programs in the Nigeria tertiary institutions. It helps to exposes students to machines and equipment. The scheme is a

tripartite program involving the students, the tertiary institution and the industry (employers of labor). It funded by the federal government of Nigeria and coordinated by the Industrial Training Fund (ITF).

1.2 OBJECTIVES OF SIWES

The objectives of student industrial work scheme are too specifically:

i. It enables students to know more about his or her course of study.
ii. Bridge the gap existing between theory and practical in Nigeria institutions.
iii. Prepare students for the work situation they are likely to meet after graduation.
iv. Provide avenue for Nigeria students to acquire industrial skills and experience in their course of study.
v. Promote the acquisition or pursuit of knowledge.
vi. Inculcate in nation the spirit of tolerance of various shades of opinion.
vii. Mobilize the public towards the achievement of the natural goals.
viii. Promote the spirit of self-reliance and engender the development of indigenous and appropriate technology.

CHAPTER TWO

2.0 SAFETY LABORATORY PRACTICE

To work in a laboratory, require great safety and care in order to avoid some laboratory hazards and also to preserve the sterilely of specimen and equipment to be used for test and analysis. Specimens that are brought into the laboratory are highly infections therefore laboratory workers should be very working in the laboratory.

Here is some of the general laboratory safety that should be taken while working in the laboratory.

- Laboratory hand gloves should be worn while handling specimens
- Laboratory coats should be worn while working
- Inoculation needled and wires loops should be flame to redness before and after inoculation so as to reduce contamination of the culture and working environment.
- Eating, talking and so on is not allowed while working in the laboratory to avoid contamination.
- All incubated cultures and sterile bottles must be labeled properly
- Used cultures should be collected and destroyed by autoclave
- Hands should be washed after every laboratory work.

2.1 EQUIPMENT AND MACHINES USED IN THE LABORATORY

There are different types of machines and equipment in the laboratory each having its function. Some of which are:

- **Universal Plastic Bottles:** It is a bottle used in collections of samples such as stool, urine, blood, semen and so on.
- **Autoclave:** It is use for sterilizing and heating solid media at 121^{o}c for 15 minutes.
- **Refrigeration:** it is used for storing, preserving samples defibrinated blood and some urgent liquid solution.
- **Centrifuge:** It is used for spinning of the fluid at different revolution.

Two samples are spined by the centrifuge.

i. **Blood:** Blood sample is spinned to separate the red blood from serum
ii. **Urine:** is spinned to separate supernatant from deposit.

- **Incubator:** It is used for micro-organism cultured on various media and it serves as artificial growing environment for micro-organism.
- **Microscope:** It is used for viewing or identifying micro-organism, which are unable to view by the naked eyes.
- **Shaker:** It is used for mixing serve and antigen to form agglutination during Widal test.

- **Distiller:** It is used for distilling water used for preparation of distilled water.
- **Weighing balance:** It is used for weighing the amount of powder needed for preparation for media.
- **Universal glass bottle:** It is a bottle where thioglycolate media is put for preparation of blood culture.

2.2 GRAM STAINING TECHNIQUES

Gram staining is carried out to determine if a bacterium is gram positive or gram negative. The morphology examples are Cocci, Bacilli etc.

PROCEDURE:

- A thin smear of bacteria was prepared by placing a drop of normal saline on a clean grease free slide and a colony was added with a sterile wire loop.
- The organism was smeared properly on the slid.
- The smear was air dry and fix by passing through the flame.
- The slid was stained with crystal violet solution (which is primary stain) for 30 – 60s.
- It was rinsed with water and logus iodine was used to flood the slide for 30 – 60s.
- It was rained with water again and acetone (which is a decolorizer was added to briefly), it was rinse immediately so that the stain will not over decolorize, thereby changing gram +ve to gram –ve.
- The acetone was rinsed the slide was and stained with neutral red, safarine or carbon fushin (which is a counter stain) for 2 minutes.
- The slide was allowed to dry and a drop of immersion oil was put on it.
- It was examined under X100 objective.

The gram positive retains the crystal violet (primary stain) and give purple color white. The gram-negative organisms loose the primary stain and retain the pink or red color of the counter stain (neutral) etc.

2.3 SENSITIVITY TEST

This test is carried out in order to know the reaction of growth of an organism to antibiotics i.e. to check whether the organism is sensitive or resistant to particular antibiotic disc. The antibiotics to which the organism's growth is sensitive can be used to treat the infected patient.

PROCEDURE:

A colony of the organism was inoculated in peptone water using a sterile wire loop. The peptone water was poured on the nutrient agar plate so as to allow it to spread on the surface of the plate excess peptone water was dispensed back into bijou bottle. The antibiotics discs were then placed on the nutrient ager plate at regular intervals and the plate was incubated at 37^0c for 18 – 24hrs (overnight). The plate sensitivity was read the next day clear zone around the antibiotic disc shows that the organism is sensitive but if there is growth around the antibiotic

disc it indicate resistance of the organism to that disc. The antibiotic disc to which the growth sensitive were recommended by the doctors for the patient, General antibiotics may be classified into two major groups.

a. Narrow Spectrum Antibiotics: these are antibiotics that inhibit or prevent the growth of either gram positive or gram negative bacteria. Examples are, Amoxyothocin, Chloramphenicol and Gentamycin etc.
b. Broad Spectrum Antibiotics: these are antibiotics that can inhibit the growth of both gram positive and gram negative. Examples are Ceftriaxone, Pelloxacin etc.

SOME ANTIBIOTIC INLCUDE

	ANTIBIOTICS	**CODE**
1.	Penicillin	P
2.	Ampicillin	A
3.	Erythromycin	E
4.	Azithromycin	AZM
5.	Chloramphenicol	C
6.	Streptomycin	S
7.	Gentamycin	G
8.	Ofloxacin	OFX
9.	Ceftriaxone	CRO
10.	Cotrimazole	COT

N.B

Antibiotic disc are that have been injected by certain antibiotics.

CHAPTER THREE

3.0 MICROBIOLOGY AND PARASITOLOGY

MICROBIOLOGY

Microbiology is a department in the U.I.T.H that deals with micro-organisms was viewed under the microscope. There are eight (8) benches in microbiology, each having its own function and area of specialization. The 8 benches are listed below:

MEDIA ROOM

The media room is important and is the heart beat in microbiology lab. Media room is a room where various media are prepared and identified.

There are three main type of media prepared for the bacteria. These are:-

I. **SOLID MEDIA:** e.g. Blood Agar, Chocolate Agar, Nutrient Agar, macConkey Agar, DCA-Deoxicolicrate Agar.
II. **LIQUID MEDIA:** e.g. Peptone water, Sugar water and Thioglicolate.
III. **SEMI-SOLID MEDIA:** e.g. Strut transport medium.

There are main type of media, these are:

i. **ENRICHED MEDIA:** These are the solid media which consist of blood e.g. Blood Agar, Chocolate Agar etc.
ii. **SELECTIVE MEDIA:** These are cultured media that supported growth of particular organisms and inheritable growth.
iii. **DEFERENTIAL MEDIA:** These are lactose famental and non-lactose famentals e.g. macConkey Agar.
iv. **TRANSPORT MEDIA:** This is commonly used to transport culture sample to reserve the sample.
v. **ENRICHMENT MEDIA:** These are the liquid media e.g. Brain heart infusion.

3.1 PREPARATION OF MACCONKEY AGAR:

1. Weigh 49.9g of MacConkey Agar
2. Dissolve in 1Lt of distilled water
3. Autoclave at 121^0c for 15min.

4. Allow to cool and pour into petri dish

3.2 PREPARATION OF CLED AGAR

1. Weigh 38g of Cled Agar
2. Dissolve in 1Lt of distilled water
3. Autoclave at 121^0c for 15min.
4. Allow to cool and pour into media plate.

3.3 PREPARATION OF BLOOD AGAR

1. Weigh 37g of blood agar base powder
2. Dissolve in 1Lt of distilled water
3. Autoclave at 121^0c for 15min.
4. Then, cool the media
5. Add blood of 2m of sterilized blood

CHAPTER FOUR

4.0 SWAB PROCESSING BENCH

SWAB PROCESSING: This is the bench where sample are collected such as eye swab, wound swab, throat swab, nasal pus and other body fluids.

PROCEDURE

DAY 1

CULTURE

1. Wound and ear swab were cultured on blood agar an macConkey agar while throat, ear, and eye were cultured on blood agar (BA), chocolate (Choc A) and macConkey Agar plates (mac A)

   The culture was carried out whereby the swab stick was used to rub the Agar plate and then a sterilize wire loop was used to streak out lines for proper growth of organism.
2. Examine microscopically, grams stain smear of swab pus and body fluid
3. Incubate culture for 18 – 24hrs at 37^0c (overnight)

DAY 2

1. Read incubate plate
2. Embark on identification procedure e.g. biochemical test etc.
3. Do anti-microbial susceptibility test on isolate
4. Incubate anti-microbial susceptibility for 18 – 24hrs (overnight)

DAY 3

1. Identify microbial agent(s)
2. Read anti-microbial susceptibility test
3. Write out the result and the dispatch

PROCEDURE OF OXIDISE TEST

i. Pour oxidize reagent on the filter paper
ii. Pick the colonies with wire loop from the cultured plate
iii. Drop it on the filter paper
iv. Observed for the color

4.1 URINE TEST ANALYSIS

URINE TEST: The urine samples are collected and the type of urine that should be collected from by patient should be earlier morning urine.

PROCEDURE

The procedure involve are culture and wet preparation (microscopy). The procedures are carried out to detect opus cell. Red Blood Cells (RBC), yeast cell, epithelia cells, eggs of schist-soma and fungi infection. The major diagnosis is (UTI) urinary tract infection.

MICROSCOPY

Urine was examine microscopically with a wet preparation in order to check for the presence of cells, crystals and eggs of scitosoma

METHOD OF WET PREPARATION

- The urine sample that was collected in a universal plastic container which should be well labeled
- The sample was spinned with centrifuge at 3000 rev for 3mins
- The supernatant was discarded while the deposits was left in the bottle
- The deposit was dropped on a slide and viewed under X40 objectiveness

SIGNIFICANCE OF WET PREPARATION

- If there are numerous pus cells in the wet preparation but no growth on the cultured plate. It means the patient is already on antibiotic drugs which is capable of inhibiting the growth of the organism.
- If there are WBCS it means there could be a clear growth, mixed growth or no growth on the sample cultured
- Presence of cast indicates liver or kidney problem in the patient.

PROCEDURE

DAY 1

CULTURE

i. Culture Blood Agar and Cled Agar
ii. Centrifuge specimen at 3000 rev for 5mins
iii. Decent the supernatant
iv. Examine the deposit microscopically using X10 and X40
v. Incubate culture for 18 – 24hrs at 37^0c (overnight)

DAY 2

i. Read the culture plate
ii. Carry out grams staining on pure and significant isolate
iii. Carry out biochemical tests the pure and significant isolate

iv. Incubate anti-microbial susceptibility to plate for 18 – 24hrs at 37^0c (overnight)

DAY 3

i. Read anti-microbial susceptibility test.
ii. Write the result out
iii. Record the result and dispatch

4.2 PARASITOLOGY BENCH

PARASITOLOGY BENCH: This is where direct stool, urine, skill snip micro funeral and malaria parasites are carried out.

PROCEDURE OF MALARIA PARASITE

i. A grease free slide was use
ii. A little drop of blood was put on the glass slide and thin film or thick film was pot on it.
iii. It was put in an ovum for 15mins in order to dry
iv. Then the dried slid was gram stain by using Giesma stain for 45mins

PROCEDURE FOR GIESMA STAIN

i. Diluted Giesma was pure for 45mins.
ii. It was rinse in buffer water solution and allows it to dry
iii. Then, direct oil immersion was dropped on the slide
iv. It was observed microscopically by using X40 objective lens
v. It was recorded and the result was dispatched.

PROCEDURE FOR SKIN SNIP FOR MICROFILARIA

i. The skin was clean with alcohol swab and dry
ii. Skin specimen was taken from the top of the buttocks
iii. A drop of saline solution was put on the slide
iv. Piece of skin snip was put in the drop and cover it with a cover slip.
v. It was examined with X10 and X40 objective lens

PROCEDURE FOR DIRECT STOOL CULTURE

To analyze stool, three basic procedures are carried out which are macroscopic, culture and microscopy.

MACROSCOPY

This is to check for the appearance, the brownish formed, hard, soft, watery etc. odor and so on, also to check if it bloody, mucous and give offensive odor.

CULTURE

The stool was cultured on the media (MacConkey, deoxy-chocolat Agar, and selenite F broth medium). The plates were then incubated at 37^0c for 18 – 24hrs (overnight).

The plates are read after 24hrs and if there are growth of salmonella and sligella, the stool is sub-cultured on DCA and then re-incubated for another 24hrs sensitivity test is set up to confirm different organisms.

MICROSCOPY

This is done to check for parasites such as hookworm, Ansaris, Schistosoma spp, Taenis, Trichuri Trichuria etc. To check for possible motile organism.

WET PREPARATION PROCEDURE

- Put a drop of normal saline and fresh iodine is placed on a sterile slide
- Using a rubber pipette, drop the stool on each slide and emulsify to obtain a thin preparation.
- Cover both slides with the slip and observe microscopically by x10 and x40 objectives tenses.

N.B: The iodine was added to kill motile farms.

4.3 SPECIAL PATHOGEN

SPECIAL PATHOGEN: Is a place where sputum is cultured and mycology is done. Sputum is cultured on Blood Agar, Chocolate Agar & MacConkey Agar. It was incubated at 37^0c for 18 – 24hrs except chocolate which was incubated an aerobically.

Sputum is cultured to detect bacteria as like protuse, klebselia, streptococcus etc.

PROCEDURE

- The sputum was cultured on Blood Agar, MacConkey Agar and Chocolate Agar.
- Incubate blood agar and macConkey agar aerobically for 24hrs at 37^0c.
- The chocolate agar was placed on a candle jar and incubated aerobically for 24hrs at 37^0c, the plate was read after the overnight and the isolate was gram stain and the biochemical test was carried out.

PROCEDURE FOR GRAM STAINING

- Gram staining is for acid alcohol fast bacilli.
- Pure carbon fustrin for 5mins heart to stream and allowed to stand for 5mins.

- Rinse with water and stain slide. Add 3% of alcohol for 3mins.
- Rinse with water and stain the slide containing with methyl blue for 2mins.
- Rinse in water and air dry view.
- Drop immersion oil.
- Carryout the biochemical susceptibility test for 18 – 24hrs at 37^0c overnight.
- Read the anti-microbial susceptibility test.
- Write out the result and dispatch.

4.4 SEROLOGY BENCH

SEROLOGY BENCH: Is a bench where Antigen Antibody reactions were being observed. The three (3) main tests that are carried out on this bench are:

- Widal Test (Typhoid Test)
- Venereal disease research laboratory (VDRL Test)
- Semen Analysis

WIDAL TEST

This test is carried out mainly to determine enteric fever or typhoid fever. The principal of this test is based on agglutin formulation. The aim is to test for salmonella organism which is a causative agent of enteric fever.

There are two (2) types of salmonella organism namely;

Salmonella Typhi

Salmonella Para-typhi

Salmonella has two antigen which is antigen (O) and antigen (H).

Antigen (O): This is regarded to as body or somatic antigens are not specific in reaction, this is regarded to as flagella, antigens are not specific in reaction.

PROCEDURE

- The blood was spined with the centrifuge at 300 rev. for 3mins to separate serum from whole blood.
- The serum was dropped on a test card using us the plastic pipette.
- The antigen O and H suspension were also added to the serum.
- The antigen suspension was mixed thoroughly with the serum.
- The test card was a rock or shake in a circular manner for 1min.
- Agglutination is observed as a result of antibody reaction.

N.B: Agglutination indicate a positive result while otherwise indicate a negative result.

VDRL (Venereal Disease Research Laboratory)

This test is carried out to check for syphilis infection caused by **Treponema Palladium** in pregnant women. This test is also carried out so that the unborn baby in pregnant women will not be affected by the syphilis because it can be cause severe conjunctivitis and other congenital abnormalities to the body during birth process through the virginal canal.

PROCEDURE

- The blood sample was spinned at 300 rev. for 5mins serum from red blood cell.
- A drop of the serum was placed on the test strip with a dropping pipette.
- A buffer solution was drop on it (to allow capillary movement hasten the reaction and maintain the PH of the serum) result was red.
- After 5mins if a line appears the result is negative but if 2 lines appears the result is positive.

SEMEN ANALYSIS

Semen Analysis is a test that is carried out on the diagnosis of infertility. Infertility can be divided into two categories namely: Primary infertility (1^0) and secondary (2^0).

Primary infertility is an infertility whereby the couple could not bear a child while secondary infertility is when the couple could not bear another after given birth to one.

STEPS TO BE TAKEN IN COLLECTING A SEMEN SAMPLE

- The patient is expected to stop sexual intercourse for 3 – 5 days before the day of collection of semen.
- The sample should be collected directly into a sterile universal plastic bottle either by masturbation or through the assistance of the wife.
- The sample should be collected around 7.00 – 7.30am and should be submitted to the laboratory within 30mins of collection.
- When bringing in a tissue paper and kept in the pocket very close to the body so as to maintain the body temperature.

N.B: When the samples get to laboratory, it should be incubated if the test is yet to be carried out on it so that the body temperature can still be maintained.

The processing of semen sample includes macroscopic motility (wet preparation), microscopy and culture.

MACROSCOPIC EXAMINATION

The macroscopicexamination includes the color appearance, viscosity, volume and P.H.

COLOR: Normally of semen is creamy but in case of hemorrhage the semen may be bloody others may be dark in color or brownish in coloration.

VISCOSITY: Semen may be hyper viscosity or hypo viscosity. It is hyper viscosity when it draws and it is hypo viscosity when it drops. This is check by dropping it using a pipette.

VOLUME: The volume of the semen was taken using a measuring cylinder. The normally volume of semen should be between 3 – 5ml.

P.H: The PH of the semen was determining using the PH litmus paper. The normal PH is alkaline between 7 – 14ml.

MICROSCOPY EXAMINATION

MOTILITY TEST: This is a form of wet preparation whereby the semen is examined microscopically to check for

- Activeness, sluggishness and non-motility
- Abnormalities e.g. no head, no tail, two heads etc., in the spermatozoa
- Pus cells and to know the average value of pus cells
- Absence of sperm cells

PROCEDURE

- A drop of the semen was put on a clean grease free slide
- It was covered with the cover slip
- It was examine microscopically

N.B: X10 objective was used to focus while x40 objective was used to magnify.

COUNTING

Counting was carried out to know the number of counts of the sperm cell in the semen; the following procedure took place in counting.

- The semen was diluted with the diluting fluid at 1.20 (adding 1 drop of semen with 19 drops of diluting fluid).
- Dilute was allowed to stand for 2 – 3mins.

- A drop is put on the counting chamber and it was examine under microscopy to know the number of counts.
- The total number of counts was multiplied by 50,000 to get the actual number of counts. The normally count of sperm cell before is 20millions. If above 20millions counts, it is called honitospermia and below (low sperm count) is called axospermia, but nowadays the normal count of sperm cell is 80millions.

4.5 CONSTITUENT AND USES OF DILUTION FLUID

The diluting fluid consist of

- Sodium bicarbonate which kill sperm cells
- Formalin which fix sperm cell so as to aid easy counting and distilled water

CULTURE

The semen was cultured using blood agar, chocolate agar and MacConkey agar plates. They were incubated at 37^0c for 18 – 24hrs. the result was read after incubation.

BLOOD CULTURE

Blood culture is carried out in order to isolate pathogens that could cause infection to the blood. The is culture primary into thioglycolate media which is an enrichment media has some is culture into thioglycolate media because the media has some additives that make it rich and the multiplication or reproductive that the bacteria in the blood.

There are two different mode of dilution of blood with thioglycolate

- Adult 18years:2ml of blood is added to 18ml of thioglicolate and dilution is called 2 in 20 dilutions.
- Children:1ml of blood is added of 9ml of thioglicolate. This dilution is called 1 in 10 dilutions.

PRECAUTIONS TO BE TAKEN IN BLOOD COLLECTION

On blood culture bench, there are two basic precautions that are needed to be taken in blood collection.

1. Site of collection must be well sterile so that bacteria on the skin will not mix with the blood.
2. Two needles must be used during this process.
3. One for collection of blood.
4. Another for introduction of blood into the thioglycolate.

PROCEDURE

DAY 1

- Samples are registered and they are given laboratory number
- The sample is incubated at 37^0c for 18 – 24hrs (overnight).

DAY 2

- The sample was sub-cultured from the liquid media (thioglicolate) to solid media (Blood Agar and MacConkey Agar) plates.
- The solid media is incubated at 37^0c for 18 – 24hrs while the liquid media is re-incubated to improve the growth of slow growers.

DAY 3

- The plates were read to identify organism. The organism can be identified by macroscopic and microscopy.
  Macroscopic such as shape of colony
  Size of colony e.g. large, small
  Consistency e.g. dry, wet, mucous
  Color e.g. pinkish, grayish
  Odor e.g. odorless, fishy, pungent
  Elevation e.g. raised or flat
  Edge e.g. smooth or rough

MICROSCOPY: Ciran staining

- Sensitivity test was carried out on the plates on which growth took place while resorb-culturing was done on plate without growth.

4.6 PROCESSING OF CEREBROSPINAL FLUID (CSF)

This test is also carried on blood culture bench. The sample used for this test is the cerebrospinal fluid which can be collected between the 4 – 5^{th} vertebras. The normally nature of CSF is clear and colorless.

The analysis of CSF involves macroscopic, microscopy, culture and gram staining.

PROCEDURE

MACROSCOPIC: This involves the color, volume and granulation. A normal CSF is clear and colorless, granulates and small in volume but as a result of clinical variation condition, it may Xanthochroid, bloody or stained.

MICROSCOPY: This is done by using sterile wire loop to place a drop of the CSF on the counting chamber and placed under the microscope whereby the cells are counted, the cells counted here are red blood cell, while cells and pus cells. The presence of insignificant white blood cells and cells indicate infection.

CULTURE: The CSF sample was cultured on blood agar and macConkey agar and the plate were incubated at 37^0c for 18 – 24hrs.

GRAM STAINING: The CSF sample was spinned and the deposit is used to make a smear on grease free slide. The slide was air dry and was fixed over the flame. The smear was gram stained and then examine under the microscope.

4.7 SEXUALLY TRANSMITTED INFECTION (STI)

This is a bench where sexually transmitted infection test are carried out. Genital infection in men and women are investigated which could be gonococcus and non-gonococcus infections. These infections affect majorly an infection caused by Neisseria Gonorrhea, Meningitis etc. while non-gonococcus infection is caused by Trichomonas spp.

The samples that are worked on here include high vaginal swab and end cervical swab and urethra swab.

The gonococcus infection can cause infertility, candid vaginal discharge and vaginal itching, sore in the genital parts and so on.

The procedure on this bench involves microscopy preparation, culture and gram staining.

CULTURE

Culture is carried out by rubbing the surface of the media (blood agar, chocolate agar and MacConkey agar) with the swab stick after which it was streak with sterile wire loop. The plates are incubated at 37^0c for 18 – 24hrs (overnight) while chocolate agar plate incubated an aerobically.

MICROSCOPY

Wet Preparation: The swab stick was soaked in normal saline and a drop is placed on a grease slide. It is place under X40 objective microscope.

The wets preparation was carried out to know presence and count of pus cell, yeast cell, epithelia cell, Trichomonas Virginals and bacteria cells (if any).

Reading of Plates

The plates were read after incubation. Sensitivity test was carried out on pathogens bacteria and the result was recorded gram staining was also carried out for identification of pathogenic bacteria. The presence of gram positive intracellular Diplococcic signifies the presence of Neisseria gonorrhea.

4.8 SENSITIVITY & BIOCHEMICAL TEST

Sensitivity test was carried out to determine the sensitivity of the organism to a certain antibiotic while Biochemical test was carried out to detect certain organism. Examples of biochemical test are indo test, coagulate, catalyst, oxidase etc.

DIRECTLY OBSERVED THERAPHY SHORT CAUSE (DOTS)

This is another branch of the microbiology laboratory where special pathogens are being diagnosed. It is also called the TB laboratory.

On this bench main sample that are being worked on are sputum, gastric washout, CSF, HIV test and 24hrs urine.

SPUTUM FOR AAFB (AID AND ALCOHOL FAST BACILI)

Sputum for AAFB which can also be called AAFB smear attaining is the major test that can be carried out to detect tuberculosis.

When a sputum sample is brought by a patient, the format to the collection of the sample is spot early morning while that of a follow up patient is early morning.

PROCEDURE

- Some of the sputum was pick from the container and rub against the frosted slide.
- It was air dry for 10mins and then fix over the flame.

CHAPTER FIVE

5.1 RELEVANCE OF THE SIWES PROGRAMME

I benefit a lot during the programme which I believed is still relevant in the following areas:

It exposed me to work methods, techniques in handling equipments that are not available in school

5.2 ADVICE TO THE COMPANY/ORGANIZATION

There should be formal training and orientation for the students under their care.

There should be appreciative measure on the part of the company because a student will work when he/she is appreciated even if not monetary.

Monthly defense of what the student has learnt should be done.

5.3 ADVICE TO THE INSTITUTIONS

a. Quality orientation programmes should be organized for all intending I.T. students and should be made compulsory (it should be on departmental/faculty levels due to the significance of each disciplines)

b. Many I.T students roam about because of lack of placement. The institution should liaise (departmentally) with some industries/organizations who will always be ready to assist.

c. Each I.T students should be allowed tcr defend their reports of SIWES programme instead of group defense.

d. Visiting of the students by the institution should be taken with all seriousness.

5.4 ADVICE TO THE STUDENTS

i. SIWES is not money-making ventures. Students should learn how to work now to get all necessary pay in the future.

ii. To those who refrain from active work, going around for personal businesses or selfish interest should stop it because the six months is not made for that but to acquire skills and knowledge.

iii. To all who really participated in the SIWES, please don’t forget all you have learnt and never trade for anything.