TITLE: VARIOUS PATHOLOGICAL TEST FOR IDENTIFICATION OF DISEASES

An Internship Report submitted

For the partial fulfillment of the Degree of Bachelor of Science By

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Enrollment no: 200601004

[B.Sc. Biotechnology, Semester VI]

Under the supervision of

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M.B.B.S., M.D.(Pathology)

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DEPARTMENT OF BIOTECHNOLOGY

ATMIYA UNIVERSITY

'YOGIDHAM GURUKUL' KALAWAD ROAD

RAJKOT (GUJARAT) – 360005

2022-2023

C E R T I F I C A T E

This is to certify that this training report entitled "**Internship -Various pathological test for identification of diseases**" was successfully carried out by **Ms. Bamaniya Kirtana K.** towards the partial fulfillment of requirements for the degree of Bachelor of Science in Biotechnology of Atmiya University Rajkot.

It is an authentic record of her own work, carried out by her under the guidance of Dr. Ishita Vaishnani for a period of 120 hours during the academic year of 2022-23. The content of this report, in full or in parts, has not been submitted for the award of any other degree or certificate in this or any other University.

-Dr. Ishita Vaishnani	**-Dr. Nutan Prakash**
Name of supervisor	Head of the Department

D E C L A R A T I O N

I hereby declare that the work incorporated in the present internship report entitled **"Various pathological test for identification of diseases**" is my own work and is original. This work (in part or in full) has not been submitted to any University for the award of any Degree or a Diploma.

Bamaniya Kirtana Kanji.

28 March 2023

Acknowledgement

Thanks God, to the merciful and the passionate, for providing us the opportunity to step in the excellent world of science. To be able to step strong and smooth in this way, we have also been supported and supervised by many people to would like to express our deepest gratitude.

The work was financially supported by Classic Pathology Laboratory. The laboratory work was done in the microbiological testing laboratory.

After thanking God, who gave us the power to finish this work, we take this opportunity to express our sincere gratitude to Ms.Ishita Vaishnani for her myriad contributes for our work and for patience, motivation , enthusiasm, and immense knowledge. Her focused guidance helps us during the writing of this project.

I find no words that can acknowledge tremendous support that our parents made to ensure that we had an excellent education. I wish our sincere thanks to her for their valuable guidance in our project work.

Finally, I consider this as an opportunity to express my gratitude to all dignitaries who have been involved in successful completion of our project work.

BAMANIYA KIRTANA KANJI

Responsibilities of laboratory work

- The laboratory worker plays an important role to find out the cause of disease by providing the physician the required laboratory test result.

- The laboratory worker thus helps the patients to get better by providing accurate test finding to the physician.

- The laboratory worker should not offer personal excuses for short-comings in the performance of duty.

- Equipment and chemicals cost money. The laboratory worker should look after all equipment carefully and should try to use the correct amount of reagent needed for each test.

- Many patients are not treated until their reports are kept ready. If these reports are delayed, patients cannot have treated early. It is necessarily to keep all reports ready in time.

- In the course of laboratory testing, the laboratory work gains a lot of information about patients and their illness. The laboratory worker must regard this information as strictly confidential.

- Only the physician who requested the examinations should receive the patient reports.

- Every laboratory worker must maintain high moral & professional standards behavior.

INDEX

1.ABSTRACT:

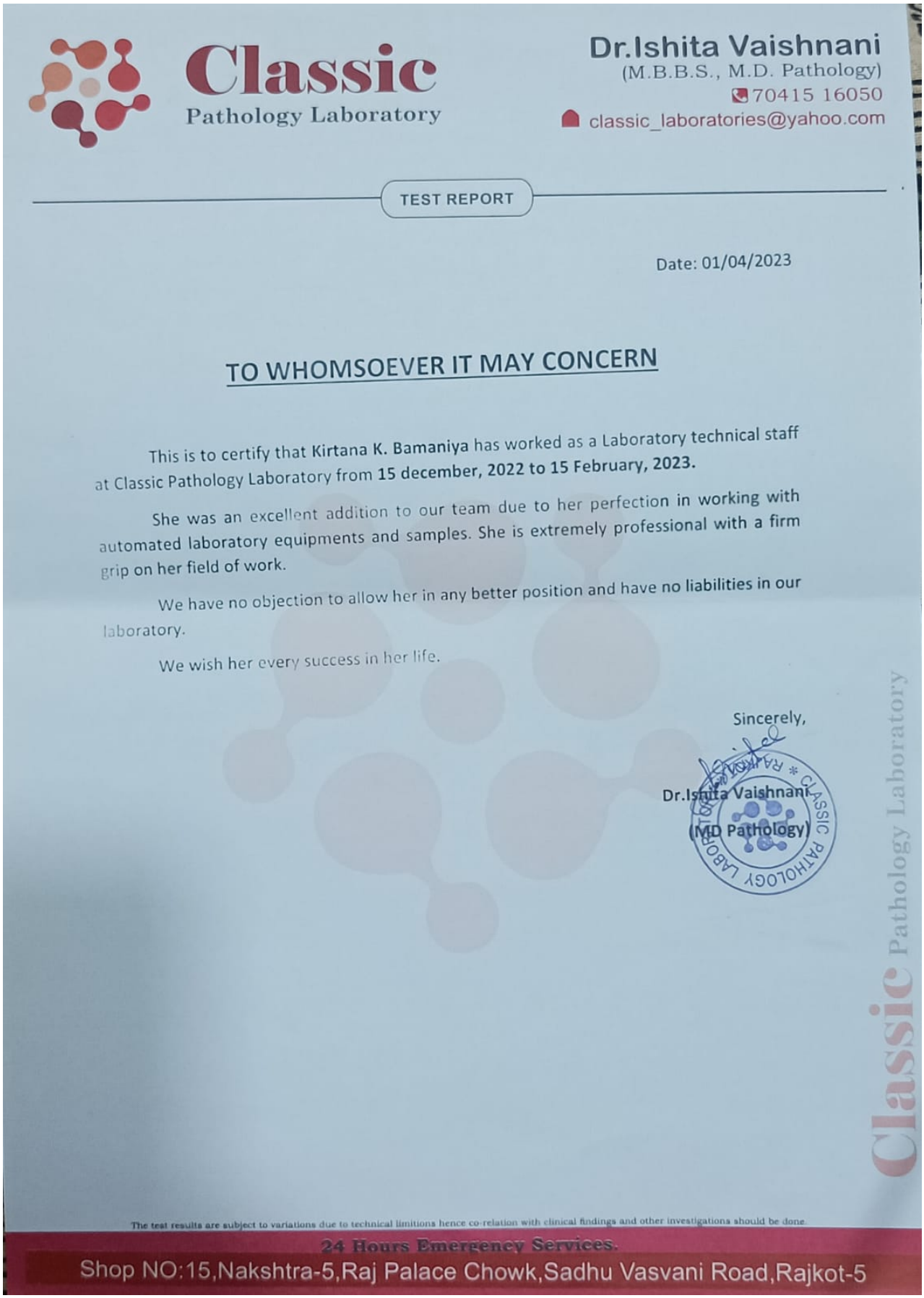
-I went to the Classic Pathology laboratory, where I introduced with such a different environment. I have to learn a lot from this place. I always leaned something new day by day. There are some consequences that I have to face, but I faced all odds and punctual at the time. I also learned so many techniques, methods, and all. I introduced with different departments of lab and work within and got so much of knowledge. I am really interested in Hematology and Bio-chemistry department, because I observe daily something new and interesting. I also learn blood collection method (Phlebotomy). In the serology department I learn rapid card test methods. In the microbiology department I learned different kinds of staining procedure. It was indeed a learning experience.

2.INTRODUCTION

- Among the finest Pathology labs in the city.
- I worked at Classic Pathology Laboratory, which is located at Shop no. 15, nakshtra-5, Sadhu Vaswani road, Raj palace chowk, Rajkot, Gujarat - 360001

- Name: Dr. Ishita Vaishnani (M.B.B.S., M.D. Pathology)
- Contact No: 7041516050
- E-mail: classicpathlab21@gmail.com
- Worked from 15 Dec 2022 to 15 Feb 2023

Certificate:



Classic
Pathology Laboratory

Dr.Ishita Vaishnani
(M.B.B.S., M.D. Pathology)
70415 16050
classic_laboratories@yahoo.com

TEST REPORT

Date: 01/04/2023

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Kirtana K. Bamaniya** has worked as a Laboratory technical staff at Classic Pathology Laboratory from **15 december, 2022 to 15 February, 2023.**

She was an excellent addition to our team due to her perfection in working with automated laboratory equipments and samples. She is extremely professional with a firm grip on her field of work.

We have no objection to allow her in any better position and have no liabilities in our laboratory.

We wish her every success in her life.

Sincerely,

Dr.Ishita Vaishnani
(MD Pathology)

CLASSIC PATHOLOGY LABORATORY * RAJKOT *

Classic Pathology Laboratory

The test results are subject to variations due to technical limitions hence co-relation with clinical findings and other investigations should be done.

24 Hours Emergency Services.

Shop NO:15,Nakshtra-5,Raj Palace Chowk,Sadhu Vasvani Road,Rajkot-5

2.1 Aim: Do practical of reports like Urine examination, CBC, HIV, Malaria parasite test

3.Materials and method:

Centrifuge:

Used for separation of plasma/serum from blood.

Purification/Separation of biological mixture sample like DNA, RNA, Proteins, RBC, WBC, pus cells.

Hematology analyzer:

A complete blood count (CBC), is a blood panel requested by a doctors, that gives information about the cells in a patient's blood, such as the cell count for each cell type and concentration of various proteins and minerals. The test can be performed via autoanalyser.

The Complete blood count Generally determines

WBC count, WBC differential count, RBC count, Hemoglobin, MCV (mean corpuscular volume), MHC (mean corpuscular Hemoglobin), Platelet count.

Automated Analyzer:

It is a medical analyzer designed to measure different chemical and other characteristics in a number of biological samples quickly, with minimal human assistance.

Biochemistry analyzer:

The Clinical Biochemistry Analyser is an instrument that uses the pale yellow supernatant portion (serum) of centrifuged blood sample or a urine sample, and induces reactions using reagents to measure various components, such as sugar, cholesterol, protein, enzyme, etc.

TUBE DETAILS

1. **Red:** Without any coagulants used to for various biochemistry tests.
   Ex. Serology examinations

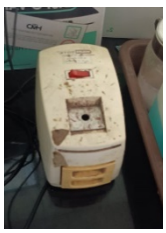
2. **Purple or lavender:** Contain K2 EDTA. This is a strong anticoagulant and these tubes are usually used for complete blood counts (CBC).

3. **Grey:** Sodium fluoride and oxalate. Fluoride prevents enzymes in the blood from working. For Blood sugar test

4. **Light blue:** Sodium citrate. Citrate is a reversible anticoagulant these tubes are used for coagulation assays. For D- dimer , platelets function

- **<u>Blood Collection:</u>**

- 1. Rub Alcohol with cotton from where the blood has to be taken.
- 2. Place the needle hole upside.
- 3. Hold the injection with one hand and pull it from top.
- 4. Take the required amount of blood sample.
- 5. Transfer the sample from injection to tube.
- 6. Cover the tube with lid and mix it slowly.
- 7. Destroy the needle of injection in needle syringe destroyer



METHODS

HIV (Human Immunodeficiency Virus)

Introduction:

Antibody tests look for antibodies to HIV in your blood or oral fluid. Antibody tests can take 23 to 90 days to detect HIV infection after an exposure. HIV self-test is antibody tests.

HIV tests are use to detect the presence of the human immunodeficiency virus, the virus that causes Acquired Immunodeficiency Syndrome (AIDS), in serum, saliva, or urine**.**

Principle: The chemical causes the antibodies in the blood to flow along the test stick. When they pass over the section with the antigens, if there are any antibodies for HIV present then they will stick to these antigens and change colour. Once the test is complete, if there is one stripe it means it is a negative result.

Procedure:

- Collect the sample and centrifuge it for 5 minutes
- Aspirate the serum through dropper
- Place a drop of serum on the marked position
- Allow it to dry then place the drop of buffer
- Add in it few drops of dye
- Observe the result

Result: HIV positive

ABO blood grouping:

Principle:

The ABO and Rh blood grouping system is based on agglutination reaction. When red blood cells carrying one or both the antigens are exposed to the corresponding antibodies they interact with each other to form visible agglutination or clumping**.**

Requirements:

1. Blood sample
2. Toothpick
3. Clean glass slide
4. Monoclonal antibodies (Anti. A, B, C)

Procedure:

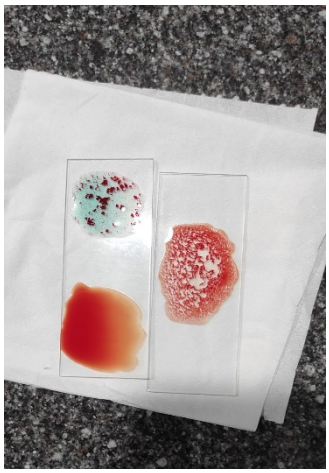
Add three drops of blood in a clean glass slide.

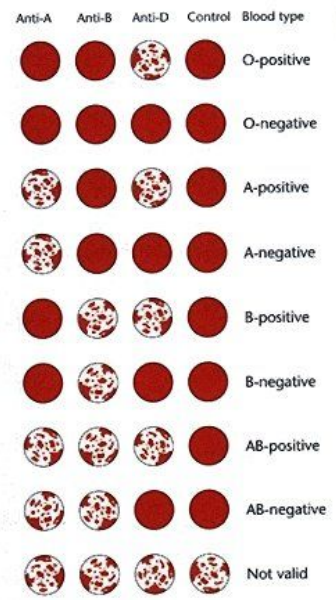
1. Add antisera A, B, D sequentially to the 1st,2nd,3rd drop of blood.

2. Properly mix the antisera with the blood by separate toothpicks.

3. Allow to stand for 2-3 minutes and note down the result on the basis of clump formation

Result: A+ blood group



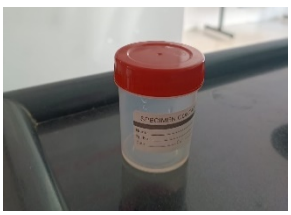


URINE EXAMINATION

Introduction:

The urine analysis is a set of screening test that can detect some common diseases. It may be used to screen for and/or help diagnose conditions such as a urinary tract infection, kidney disorders, liver problems, diabetes or other metabolic conditions, to name a few.

Collection of urine done in this cylinder



Urine examination

1. Physical examination

2. Chemical examination

3. Microscopic examination

1.Physical examination

It includes.

- Volume

Appearance

- pH

- Odor

- Specific gravity

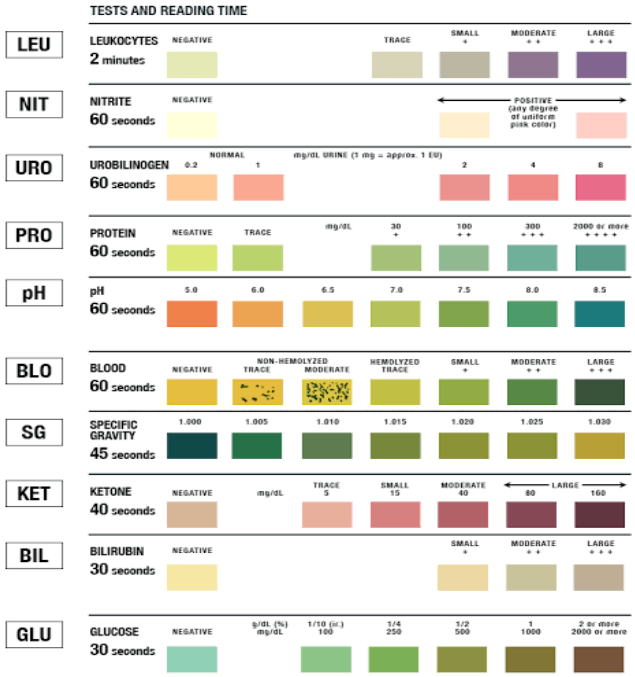
2.Chemical Examination:

- It can be done by reagent strip

For chemical examination urine test strip or dipstick is used to determine pathological changes in patient's urine.

A urine test strip contains up to 10 different chemical pads or reagents which reacts when immersed in, and then removed from, a urine sample.

Result of color change is observed after 30 to 60 seconds of dipping. The analysis includes testing for the presents of glucose, protein, ketones, biliburin, PH and specific gravity.



3.Microscopic examination

- Specimen is centrifuged first.
- Supernatant is discarded.
- The sediment is placed on the clean glass slide and
- observed under microscope.

- Pus cells, epithelial cells, different oxalates can be observed. Bacterial or fungal cells can be observed if person suffer from infections.

Urine slide preparation:

01. Centrifuge the urine.

02. After centrifugation empty the whole tube.

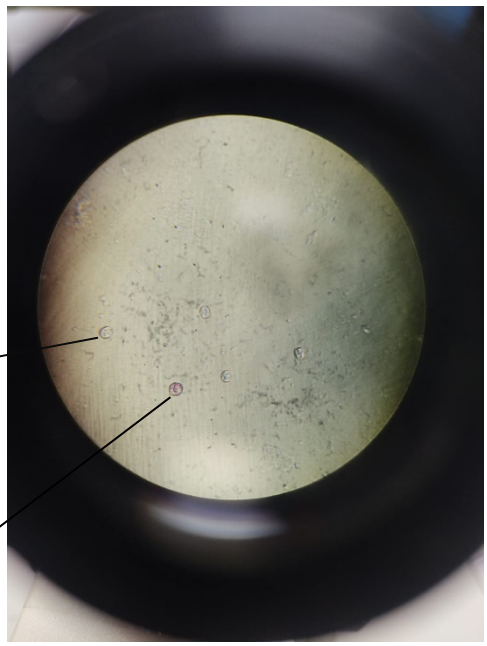
03. Place a drop of urine settled at the bottom on a slide.

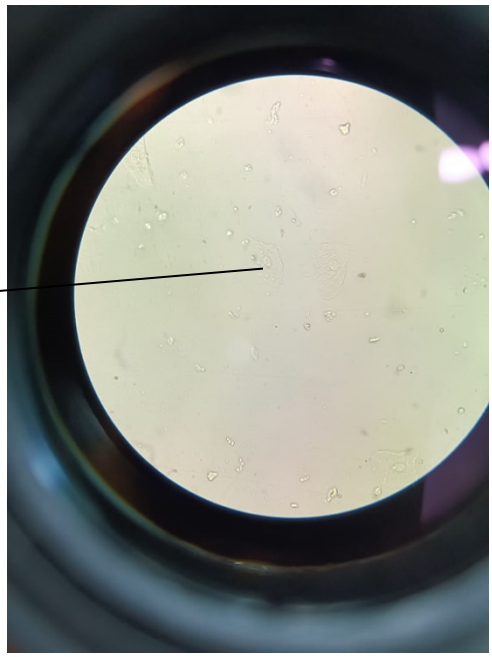
04. Prepare smear and cover it with coverslip.

05. Observe under microscope (done by our mentor)

Result:

Urine examination: pH is 6.0, Glucose is present (+ +), Protein is absent.





Microscopic urine examination result: pus cells, RBC cells, epithelial cells observed.

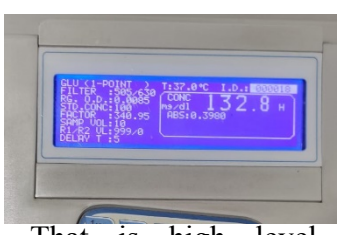
<u>Glucose blood sugar)</u> : used to screen for diabetes. Detect the level of glucose in blood.

method: 1000µl reagent + 10µl sample(serum), 10 min incubation at 37 °C, then aspirate

Fasting sugar 70-110 mg/dL

Post prandial blood sugar 100-140 mg/dL

Random blood sugar 70-140 mg/dL



Result: 132 mg/dL glucose present in fasting sugar test That is high level glucose in blood.

Incubator

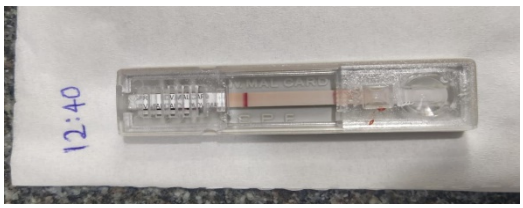
Malaria parasite card test

Principle:

A blood specimen collected from the patient is applied to the sample pad on the test card along with certain reagents. After 15 minutes, the presence of specific bands in the test card window indicate whether the patient is infected with Plasmodium falciparum or one of the other 3 species of human malaria.

Procedure:

- Ensure specimen and test kits are brought to room temperature before testing.
- Open the foil wrapped pouch and remove the cassette.
- Transfer the whole blood specimen to the blood collection tube using a pipette or dropper.
- Read the results at 10 -15 minutes once the colored line(s) have appeared.



Result: Negative.

4.RESULTS AND DISCUSSION

- I have done some reports like CBC, Blood Grouping, Urine examination.
- Fasting glucose test, Random blood sugar
- HIV and Urine Examination
- Malaria parasite test

5.CONCLUSION

- To conclude this report, I would like to say this internship in Classic Pathology Laboratory gave me an idea about the different fields that I can work in.
- I found it really interesting how the all equipments and machines have the capacity to run with large number of the tests in short time with a high accuracy.
- In future I would like to learn other diagnostic tests like Cholesterol tests, Thyroid function tests, etc.
- It helped me to bind theory to skills. And learn to analyze report and results.

6.REFERENCE

- Some photos of tubes are uploaded from the internet; who's copyrights belong to respected parties.
- Photos own clicked.

Thank you