SHORT TERM INTERNSHIP

ON

DIAGNOSTIC TECHNIQUES AND PROCEDURES IN MICROBIOLOGY

NAME OF THE STUDENT :BANDELA SHEENA PRIYA

REGISTRSTION NUMBER ; 20205017

GROUP : B.Sc.MB.BT.C

NAME OF THE COLLEGE : DR.V.S.KRISHNA GOVERNMENT DEGREE&PG COLLEGE(A)

NAME OF THE HOD : DR.C.H.LALITHA

NAME OF FACUTLY : DR.K.PRAKASH NARAYANA REDDY

GUIDE

NAME OF THE : MY LABS DIAGNOSTIC CENTRE

INTERNSHIP INSTITUTE

NAME OF THE INTERNSHIP : DR.V.ASHOK KUMAR

GUIDE

Dr. V. S. Krishna Government Degree College(A)
Visakhapatnam
Reaccredited by NAAC with "A" grade(3rd cycle)

Short term Internship (Onsite)

On

Clinical Microbiology & Biochemistry

Sumbitted by

BANDELA SHEENA PRIYA

Group : Microbiology, Biotechnology and chemistry (MBBTC)

Registration Number : 20205017

Department of Microbiology

Internship period : October2022 To November 2022

PROGRAM BOOK FOR
SHORT TERM INTERNSHIP

Name of the Student: BANDELA SHEENA PRIYA

Name of the College :-Dr. V. S. Krishna Government
Degree & PG College (A),
Visakhapatnam.

Registration Number:20205017

Period of Internship:1 Month **From:** 21 -10- 2022 **To:** 21-11-2022

Name & Address of the Intern Organization:

MY LABS

D.No.13-28/8,

Jagadamba junction,

Vishakhapatnam .

An Internship Report on

SHORT TERM INTERNSHIP ON CLINICAL MICROBIOLOGY AND BIOCHEMISTRY

Submitted in accordance with the requirement for the degree of

B.Sc. Microbiology,Biotechnology and Chemistry (MBBTC)

Under the Faculty Guideship of

DR.K.PRAKASH NARAYANA REDDY

Department of Microbiology

Dr. V. S. Krishna Government Degree & PG College (A), Visakhapatnam

Submitted by:

BANDELA SHEENA PRIYA

Reg.No: *20205017*

Department of Microbiology

Dr. V. S. Krishna Government Degree & PG College (A), Visakhapatnam.

Student's Declaration

I, **BANDELA SHEENA PRIYA** a student of BSc .Microbiology, Biotechnology and Chemistry (MBBTC)Program, Reg. No. 20205017 of the Department of Microbiology ,Dr.V.S. Krishna Government Degree & PG College (A), do hereby declare that I have completed the mandatory internship from 21-10-22 to 21-11-22 in MY LABS DIAGNOSTICS , Visakhapatnam, under the Faculty Guideship of **DR.K.PRAKASH NARAYANA REDDY**, Department of Microbiology , Dr. V. S. Krishna Government Degree & PG College (A), Visakhapatnam.

B. Sheena Priya

Signature of the Student

Date : 25-11-2022

Official Certification

This is to certify that **BANDELA SHEENA PRIYA** Reg. No.*20205017* has completed his/her Internship in *MY LABS Diagnostics , Visakhapatnam*. Short term internship under my supervision as a part of partial fulfillment of the requirement for the Degree of *B.Sc.Microbiology ,Biotechnology and Chemistry (MBBTC)* in the Department of *Microbiology ,Dr. V. S. Krishna Government Degree & PG College (A), Visakhapatnam.*

This is accepted for evaluation.

Signature of mentor

Date :- 25/11/22

25/11/2022

Head of the Department

Dr. CH. LALITHA
Head of the Department
Department of Microbiology
Dr. V.S. Krishna Govt. Degree College (A)
VISAKHAPATNAM

Principal

CERTIFICATE OF INTERNSHIP

This is to certify that **BANDELA SHEENA PRIYA** bearing **Regd No: E20205017**

Pursuing Bsc(Microbiology , Bio technology, chemistry) 5 th semester In Dr V S Krishna Govt Degree college(A) Visakhapatnam.For him/ her Internship training from 21.10.2022 to 21.11.2022 outstanding completion of the internship program at ***My labs Diagnostics and research*** centre under the guidance of Dr V Ashok kumar from 21.10.2022 to 21.11.2022.He/she is found to be hardworking, sincere and deligent. We wish him /her all the best for future.

Dr V Ashok Kumar
Lab Director

EXTERNAL ASSESSMENT STATEMENT
(To be used by the Examiners)

Name of the Student: BANDELA SHEENA PRIYA

Programme of Study: B.Sc.

Year of Study: 2022-2023

Group: Microbiology , Biotechnology and Chemistry (MBBTC)

Register No/H.T. No: 20205017

Name of the College: Dr. V. S. Krishna Government Degree & PG College (A), Visakhapatnam.

University: Andhra University, Visakhapatnam.

S. No.	Evaluation Criterion	Maximum Marks	Marks Awarded
1.	Internship Evaluation	80	
2.	For the grading giving by the Supervisor of the Intern Organization	20	
2.	External Viva - Voce	50	
TOTAL		150	
GRAND TOTAL (EXT. 150 M + INT. 50 M)		**200**	

Final Evaluation Committee

1. **Teacher Guide:** 25/11/22

2. **Internal Expert:**

3. **External Expert (Nominated by the affiliating University):**

4. **Signature of the Principal/HOD with Date & Seal:**

Acknowledgements

It gives me an immense pleasure and pride to express my sincere gratitude and respect for my teacher and guide **DR.K.PRAKASH NARAYANA REDDY** *, Dr. V. S. Krishna Government Degree & PG College (A) Visakhapatnam for his expert and inspiring guidance.Also, I am very grateful to the head of the Department of Microbiology and the other faculty members of the Microbiology Department for being a source of support during this project period.*

I would like to extend my gratitude to **DR.I.VIJAYA BABU**, *principal ,DR.VS.KRISHNA GOVT DEGREE AND PG COLLEGE (A) providing me all the necessary facilities that were required for successful completion of this internship.*

I also thank My labs Diagnostics , Visakhapatnam for providing internship opportunity.

My special thanks to the internship trainer **Dr.V.Ashok Kumar** *for their constant support, encouragement and timely advice.*

B. Sheena Priya.

Signature of the student

Contents

INTRODUCTION

Internship is an integral platform for anyone to gain experience in the actual work place. Thus, Internship is a good opportunity for students to learn, to gain experience and also to make preparations. Men learn through experience and real life is full of different kinds of experiences. We will encounter many difficulties and obstacles and with experiences we are expected to be able to encourage and complete the process. Experience in my eyes is a very valuable thing in life because we need to be brave in taking risks. It is also not something that we simply create, but we need to undergo through it. By doing my internship in an actual work environment, it helps me to know and discover myself from different angles. It also helps me to control and develop my attitude towards dealing with different kinds of people and situations.

I have decided to take the internship course to grab the golden opportunity to apply theoretical knowledge that I have in a real working environment. Through college, I learned about theories but doing an internship, I learned a practical approach on dealing with the real world. Even though it was not that much, it still has profound results in some aspects of my life. In some ways, through internship, I also have learned that I am still lacking as an individual and employee. Internship helps me to identify my weaknesses and also my strengths. "Experience without theory is blind, but theory without experience is mere intellectual play". The other reason why I choose to take the internship is as preparation for a more challenging work environment and situation. Our life in college is incomparable with real working experience. A working life is very challenging as it requires great effort, commitment and abilities; those are something that I need to be prepared and trained to.

Apart from that, I really want to gain professional experience and skills by taking the internship course. At the same time, I also want to improve my communication skills and ability to interact with people. I realize that by being part of society, I will need to meet different people around the office and I will have to communicate with them to settle their needs. Undergoing internship also helps to make me learn on how to work in a systematic organization. It helps me to learn how to be independent in accomplishing my tasks. Besides, all knowledge that I have learnt through my classroom learning in the classroom can be implemented through an internship. Not only that, by doing an internship, I am able to undergo challenges which are normal in a working life setting.

CHAPTER1: EXECUTIVE SUMMARY

The internship report shall have only a one-page executive summary. It shall include five or more Learning Objectives and Outcomes achieved, a brief description of the sector of business and intern organization and summary of all the activities done by the intern during the period.

This report describes a brief description of the work that has been carried out by me in the laboratory during training at Sree balaji diagnostics. I have been working in laboratory during my training period from 1st march to 31st may of 2023. There were several departments where as- clinical pathology, CLIA, Biochemistry, Haematology, serology and microbiology.

In clinical pathology I have learn how to operate a semi- automated urine chemistry analyser instrument which gives No. Of the tests glucose, bilirubin , ketone, protein, urobilinogen, nitrite, leukocytes, colour of the urine and ph etc..

In CLIA(Chemiluminescence) in this section I have gained the knowledge of how to operate the instrument and conduct hormones test like T3, T4 and TSH.

In biochemistry- I used to operate manual and automatic machines which gives the results of glucose, uric acid, cholesterol, triglycerides and other LFTs and RFTs.

In haematology- I have learned how to operate the machine (CBC – Hematoanalyzer) the test which conduct in this machines these are RBC, WBC, Platelets and clothing factors.

Serology- there was most of work done by manually but mostly I have used ready made kit which provided by manufacturer company. These test were WIDAL, CRP, HIV, HBSAG etc...

In microbiology- I have learned about culture of blood, body fluids and there are which was automated and give the sensitivity of antibiotics and presence of different bacteria. I have mentioned in the report.

CHAPTER2: OVERVIEW OF THE ORGANIZATION

Suggested Contents

A. **Introduction of the Organization**

My labs Diagnostic centre in Maharanpeta Vishakhapatnam has a well equipped clinic with all the modern equipments.the clinic has separate waiting and consultation area which allow enough space for patients to wait conveniently at the clinic

- Being a specialized diagnostics centres the doctor offers a number of medical services.
- 23 diagnostic and pathology , magnetic resonance imaging among other.
- The clinic is operational between 24/7hours services.
- IT has covid-19 testing lab.
- The service provided by MY LABS DIAGNOSTICS are allergies tests, anaemia tests, blood test, bone density testing, diagnostic imagine, ECG testing,EEG testing , Home collection, HSG testing, Mammograms,Online diagnostic centre booking,Online results , Thyroid testing, X-ray, Hematology,microbiology , Molecular biology and pathology.
- CovidRT-PCR test, Life Science student projects, Research projects HIV test, Internship etc.

B. **Vision,MissionandValues of the Organization**

- Vision: To ensure that the entire laboratory examination procedures conducted gives accuracy, reliable and the highest quality results.

- Mission: SREE BALAJI DIAGNOSTICS mission is to provide high quality laboratory services at reasonable prices in the shorter time possible with the importance on quality and complete clinical contentment.

- VALUE:

1.Integrity: we always do what is right and ethical.

2.Professionalism: we always serve our patients professional conduct.

3.Patient – centered care: we, at all time, put the needs of our patient at the core of what we do.

4.Innovation: we pursue opportunities to continuously improve our work to maintain the highest possible standards of service delivery.

5.Excellence: we endeavour to consistently exceed the highest standards of quality in our service.

6.Quality: we continuously deliver high quality service to our patients.

7.Cooperation: we always work as a team to ensure delivery of highest possible quality of service to our patients.

C. **Policy of the Organizationin relation to the intern role**

The policy statement explains the expectation and the requirements of our internship program as well as the cooperative relationship among the sponsoring agency, the department and the students. The internship has to be meaningful and mutually beneficial to the intern and the organization.

D. **Organizational Structure**

The laboratory is constructed of multiple Hierarchical levels of staffing each of the required positions is to be filled by qualified personnel. Multiple personal within in the organization may be qualified to serve in a prescribed role such as, general superior.

E. **Roles and responsibilities of the employees in which the intern is placed.**

- The person responsible for the internship is considered the site superior. Respect the personal integrity of the internship student.
- Accept the internship student both as a student and as a colleague.
- Establish and maintain informal, friendly working relation with the internship student.
- Originate and suggest new ideas without domination, based on defensible standards , rather than asking you to make decision.
- Encourage the internship student to express their problems and to make decisions.
- Observe the student at work and record observations without disturbing the internship student balance and poise .

F. **Performance the Organization Terms of turnover,profits,market reach and market value.**

Clinical laboratories need to manage resource properly and scientifically to survive in today's highly competitive environment.

G. **Future Plans of the Organization.**

- Providing objective, complete and scientifically sound reports to the requests.
- Developing the high – quality lab professionals committed to life long learning .
- Patients safety.
- Accuracy and reliability of results.
- Stake holders satisfaction.
- Operational and professional development.
- Financial results.

CHAPTER3: INTERNSHIP PART

Description of the Activities/Responsibilities in the Intern Organization during Internship, which shall include - details of working conditions, weekly work schedule, equipment used, and tasks performed. This part could end by reflecting on what kind of skills the intern acquire.

WEEKLY ACTIVITY LOG

ACTIVITY LOG FOR THE FIRST WEEK

Day & Date	Brief Description of The Daily Activity	Learning Outcome	Person In-Charge Signature
Day –1 21-10-2022	**CBC :** Complete blood count is a commonly performed lab test. It can be used to detect or monitor many different health conditions. 1.To monitor a long term (chronic) health problem that may change your blood count results, such as chronic kidney disease. **LFT:** Blood tests that measure different enzymes, proteins, & other substances made by the liver. **RFT :** Renal function test are group of tests that may be performed together to evaluate kidney function.	Blood counts may very with altitude. In general, normal results are : RBC – count Male- 4.7 to 6.1 mcl Female- 4.2 to 5.4mcl WBC- 4,500 to 10000 cells. Abnormal blood test result for typical liver function include ALP-7 55 units per liter . If the GFR is less than90 but more than 60,suggests mild kidney disease	AK
Day - 2 22-10-2022	**WIDAL TEST:**is an advanced way to check for antibodies that your body makes against the salmonella bacteria that causes typhoid fever. If looks for O and H Ab in a patient's blood serum. **THYROID PROFILE** - Thyroid function tests is a collective term for blood test used to check the function TSH. T4, T3& Thyroid antibody test.	This test helps detect life threatening illnesses like typhoid fever. Thyroid - 0.4 to 4.0 mlu/L.	AK

Day –3 **25-10-2022**	**TSH :** Thyroid stimulating hormone .The test is used to measure the amount of thyroid in blood . **CRP : C**-reactive protein test measures the level of crp in a sample of blood . **HIV :** used to detect the presence of human immunodeficiency virus .	t can tell if you have hyperthyroidism or hypothyroidism on your blood. t is tested in case of fever & Autoimmune disorders. The given as positive (or) negative in determinated	AK
Day –4 **26-10-2022**	**HIV :** used to detect the presence of human immunodeficiency virus . **HbsAg** looks for hepatitis B surface antigen in your blood . **MALARIA : R**apid test used to detect the foreign antigens which causes the malaria .	The given as positive (or) negative in determinated The presence of HbsAg indicates that the person infection detect positive result it presence of malaria parasite in your blood .	AK
Day –5 **27-10-2022**	**Antibiotics Sensitivity :**used to help find the best treatment for bacterial infections . **CBC : :** Complete blood count is a commonly performed lab test. It can be used to detect or monitor many different health conditions. 1.To monitor a long term (chronic) health problem that may change your blood count results, such as chronic kidney disease.	find out which treatment will work best on certain fungal infections. Blood counts may very with altitude. In general, normal results are : RBC – count Male- 4.7 to 6.1 mcl Female- 4.2 to 5.4mcl WBC- 4,500 to 10000 cells. If the GFR is less than90 but more than 60,suggests mild kidney diseases	AK

Day –6 28-10-2022	**DENGUE :** patients with suspected dengue virus disease, NAATS are preferred method of laboratory diagnosis NAATS was performed on serum specimen collected 7 days Or less after symptom on set. **CBC :** Complete blood count is a commonly performed lab test. It can be used to detect or monitor many different health conditions. 1.To monitor a long term (chronic) health problem that may change your blood count results, such as chronic kidney disease. **RFT : :** Renal function test are group of tests that may be performed together to evaluate kidney function.	+ve result confirms dengue virus infection, - ve result should be tested for the presence of IgM antibodies against dengue virus. Blood counts may very with altitude. In general, normal results are : RBC – count Male- 4.7 to 6.1 mcl Female- 4.2 to 5.4mcl WBC- 4,500 to 10000 cells. If the GFR is less than90 but more than 60,issuggests mild kidney diseases	

WEEKLY REPORT
WEEK – 1. (From Dt...21-10-2022...to Dt...28-10-2022..)

Objective of the Activity Done:

- Receiving, labeling and analyzing samples (blood, toxic, tissue etc.)
- Designing and executing laboratory testing according standard procedures
- Conducting experiments under defined conditions to verify/reject various types of. hypotheses using refined scientific methods.

Detailed Report:

In 1st week intership, I met with lab supervisor Dr.k.Ashok Kumar .He gave me the brief introduction about the labethics, structure of organization and told about the different department such as clinical pathology, CLIA, biochemistry, hematology, serology, and microbiologyy and tests done under them. And I learned how to take to use and machinees which are use for performing lab tests.we learned about CBC-Complete blood count,LFT - Liver function test, that measures different proteins and enzymes,RFT - Renal function test.On the Second day,we learned about WIDAL test,that identify the presence of typhoid fever and Thyroid Profile - used to check their function.On the third day, we learned about TSH -Thyroid stimulating hormone that helps to identify thyroid levels in the blood,CRP -It C-reactive protein and HIV- human immunodeficiency virus.On the fourth day, we learned about HIV,HbsAg -Hepatitis B surface antigen.On the fifth day, we learned about Antibiotics sensitivity - that helps to observe the inhibition zones of antibiotic discs,and CBC - observe the total RBC,WBC, PLATELETS.on the last day of the week,we learned about Dengue test - it is a viral disease,CBC,RFT -Renal function test to evaluate the function of the kidney.

ACTIVITY LOG FOR THE SECOND WEEK

Day& Date	Brief Description of The Daily Activity	Learning Outcome	Person In-Charge Signature
Day –1 29-10-2022	**THYROID PROFILE :** function tests is a collective term for blood test used to check the function TSH. T4, T3& Thyroid antibody test.	Thyroid - 0.4 to 4.0 mlu/L.	AK
Day - 2 1-11-2022	**DENGUE**- patients with suspected dengue virus disease, NAATS (Nucleic Acid Amplification)are preferred method of laboratory diagnosis NAATS is performed on serum specimen collected 7 days Or less after symptom on set. **CBC** : Complete blood count is a commonly performed lab test. It can be used to detect or monitor many different health conditions. 1.To monitor a long term (chronic) health problem that may change your blood count results, such as chronic kidney disease.	+ve result confirms dengue virus infection, - ve result should be tested for the presence of IgM antibodies against dengue virus. Blood counts may very with altitude. In general, normal results are : RBC – count Male- 4.7 to 6.1 mcl Female- 4.2 to 5.4mcl WBC- 4,500 to 10000 cells.	AK
Day –3 2-11-2022	**CBC:** .Complete blood count is a commonly performed lab test. It can be used to detect or monitor many different health conditions. 1.To monitor a long term (chronic) health problem that may change your blood count results, such as chronic kidney disease.	Blood counts may very with altitude. In general, normal results are : RBC – count Male- 4.7 to 6.1 mcl Female- 4.2 to 5.4mcl WBC- 4,500 to 10000 cells.	AK

Day –4 **3-11-2022**	**CRP**-It is used to find inflammation in your body. Inflammation could be caused by dots types of conditions, such as infection or Autoimmune disorders. **WIDAL TEST** :is an advanced way to check for antibodies that your body makes against the salmonella bacteria that causes typhoid fever. If looks for O and H Ab in a patient's blood serum.	It is tested in case of fever & Autoimmune disorders. This test helps detect life threatening illnesses like typhoid fever.	Ak
Day –5 **4-11-2022**	**HIV :** used to detect the presence of human immunodeficiency virus . **HbsAg** looks for hepatitis B surface antigen in your blood .	The given as positive (or) negative in determinated The presence of HbsAg indicates that the person infection.	Ak
Day –6 **5-11-2022**	**ABO GROUPING :** the test to determine your blood group is called ABO Typing **GLUCOSE TEST :** test used to find the blood sugar levels in the body	Blood typing is done so you can safely receive a blood transfusion or a transplant A blood sugar equal to (or)less than 140mg/dl.	Ak

WEEKLY REPORT
WEEK – 2. (From Dt...29-10-2022... to D....5-11-2022.....)

Objective of the Activity Done:

- Receiving, labeling and analyzing samples (blood, toxic, tissue etc.)
- Designing and executing laboratory testing according standard procedures
- Conducting experiments under defined conditions to verify/reject various types of hypotheses using refined scientific methods

Detailed Report:

In the second week,we learned about Thyroid Profile test - to measure the function of thyroid hormone, Dengue test - NAATS are performed methods in the laboratory.On the second day, we learned about CBC - to monitor long term health problems that may change your blood count results,On the third day, we learned about MALARIA test - to detect antigens that causes malaria,CBC - to detect total count of RBC, WBC and Platelets.On the fourth day, we learned about CRP test - C - reactive protein, that checks the presence of infection or inflammation in the body,WIDAL test - is to check presence of typhoid fever..On the fifth day, we learned about HIV test - human immunodeficiency virus, HbsAg.On the last day of the week, we learned about CBC and ABO grouping to determine blood group typing, Glucose test is to determine the blood sugar levels in the body.

ACTIVITY LOG FOR THE THIRD WEEK

Day & Date	Brief Description of The Daily Activity	Learning Outcome	Person In-Charge Signature
Day –1 7-11-2022	**MALARIA :** Rapid test used to detect the foreign antigens which causes the malaria	detect positive result it presence of malaria parasite in your blood .	AK
Day - 2 8-11-2022	**Antibiotic sensitivity :** used to help find the best treatment for bacterial infections .	find out which treatment will work best on certain fungal infections	AK
Day –3 9-11-2022	**CRP: : It is used to find inflammation in your body. Inflammation could be caused by dots types of conditions, such as infection or Autoimmune disorders.**	It is tested in case of fever & Autoimmune disorders.	AK
Day –4 10-11-22	**URINE TEST :** A urine R/E/ urine routine/ examination or routine urine analysis is used to diagnose and treat various illnesses including urinary tract infections, kidney disease and diabetes.	The urine routine test is analyses to diagnose various liver, kidney and urinary tract disease	AK
Day –5 11-11-2022	**LFT :** Blood tests that measure different enzymes, proteins, & other substance made by the liver.	Normal blood test results for typical liver function test includeALP-7 to 55 units per liter .	AK

Day –6 **12-11-2022**	**RFT :** Renal function test are group of tests that may be performed together to evaluate kidney function.	If the GFR is less than90 but more than 60,it suggests mild kidney diseases .	AK

WEEKLY REPORT

WEEK – 3. (From Dt 7-11-2022 .. to Dt...12-11-2022.....)

Objective of the Activity Done:

- Receiving, labeling and analyzing samples (blood, toxic, tissue etc.)
- Designing and executing laboratory testing according standard procedures
- Conducting experiments under defined conditions to verify/reject various types of hypotheses using refined scientific methods

DetailedReport :

In the third week,we learned about Hb A1c test is to measures average sugar levels over a past 3 months,RFT test is to evaluate the kidney functions.On the second day,we learned about Antibiotic sensitivity is used to treat bacterial infections.On the third day, we learned about about HIV and CRP test is used to find inflammation in your body.On the fourth day, we learned about Urine test - used to examine urine analysis to diagnose the urinary tract infections.On fifth day,we learned about LFT test is to measure different proteins, enzymes that produce by the liver.On the last day of the week, we learned about RFT test is a group of tests that performed togather to evaluate kidney function.

ACTIVITY LOG FOR THE FOURTH WEEK

Day & Date	Brief Description of The Daily Activity	Learning Outcome	Person In-Charge Signature
Day –1 14-11-2022	**LIPID PROFILE : blood test that can measure the amount of cholesterol & triglycerides in your blood.**	It measure the amount of cholesterol and triglycerides in your blood. (cardiovascular risk)	AK
Day - 2 16-11-2022	**CRP :** It is used to find inflammation in your body. Inflammation could be caused by dots types of conditions, such as infection or Autoimmune disorders.	It is tested in case of fever & Autoimmune disorders.	AK
Day –3 17-11-2022	**Antibiotic sensitivity :** used to help find the best treatment for bacterial infections .	find out which treatment will work best on certain fungal infections	AK
Day –4 18-11-2022	**WIDAL TEST :** :is an advanced way to check for antibodies that your body makes against the salmonella bacteria that causes typhoid fever. If looks for O and H Ab in a patient's blood serum.	This test helps detect life threatening illness like typhoid fever.	AK
Day –5 19-11-2022	**RFT :** Renal function test are group of tests that may be performed together to evaluate kidney function	If the GFR is less than90 but more than 60,suggests mild kidney diseases	AK
Day –6 21-11-2022	**Antibiotic sensitivity :** used to help find the best treatment for bacterial infections .	find out which treatment will work best on certain fungal infections	AK

WEEKLY REPORT
WEEK – 4. (From Dt 14-11-2022.. to Dt 21-11-2022..)

Objective of the Activity Done:

- Receiving, labeling and analyzing samples (blood, toxic, tissue etc.)
- Designing and executing laboratory testing according standard procedures
- Conducting experiments under defined conditions to verify/reject various types of hypotheses using refined scientific methods

DetailedReport:

In the fourth week, we learned about LIPID PROFILE - it is a blood test to measure cholesterol and triglycerides in the blood.On the second day, we learned about CRP test is to check if there is information in your body, WIDAL test is to check for the antibodies that your body makes against the salmonella bacteria that causes typhoid fever and TORCH test,it is group of blood test.On the third day, we learned about Antibiotic sensitivity test is to treat the bacterial infections.On the fourth day,we learned about TROPONIN test that measures the levels of proteins in the blood.On the fifth day,we learned about ELECTROLYTES test to measure the electrolytes imbalance in the body.On the last day of the week, we learned about Antibiotic sensitivity test to treat the bacterial and fungal infections.

DETAILED INTERNSHIP PROJECT REPORT

a.Introduction

b.Project specification (area / background of the assigned).

c.Problems taken up.

d.Analysis of the Problem

e.Recommendation and Conclusion

CHAPTER 4: OUTCOMES DESCRIPTION

Describe the work environment you have experienced

I experienced best work environment in the internship. The people are hostile. They have the best facilities and good maintenance. Assigning jobs to the people is non discrimable. The proper safety protocols are used in labs with proper time management, mutual support and teamwork. It's spaceous of Ventilatable.

Describe the real time technical skills you have acquired

- Using and maintaining lab equipment such as microscope, autoclaves, incubators, chemical analyzers and cell counters.
- Devising and executing experiments.
- Analyzing biological samples such as tissue and bodily fluids.
- Record the findings of analysis.
- Inserting data gathered from tests into reports.
- Regularly the findings of analysis.

Describe the managerial skills you have acquired

I acquired the managerial skills through good communication of motivation. Learning the skills which are valuable. Setting some goals to achieve. Creating time to work on skill and choosing the correct training. Analysing the performance through correct decision making.

Describe how you could improve your communication skills

- By making my communication relevant.
- Talking professionally.
- Being kind and real.
- Avoid being vulgar and crude.
- Choosing my words wisely.
- Keeping my emotions in check.
- By using proper grammar.

- **Be in control of my body language.**

Describe how you could enhance your abilities in group discussions, participation in teams, contribution as a team member, leading a team/activity

- By being gentle and sure in my presentation of views.
- By not repeating the points.
- Be calm and composed while speaking.
- Listening to other is also an important aspect of participation in the group discussions.
- Maintaining eye contact while speaking.

Describe the technological developments you have observed and relevant to the subject area of training *(focus on digital technologies relevant to your job role.*

The technological development I have observed is providing efficient way treating the. problems.

- *It provides a wealthy of theoretical and practical knowledge about the diagnosis, treatment.*

- *It is the overall process of invention, innovation and diffusion of technology or processes . It helped pave the way for a faster and easier way to understand the diagnosis.*

MARKS STATEMENT
(To be used by the Examiners)

INTERNAL ASSESSMENT STATEMENT
(Assessment by the industry / enterprise / organisation)

Name of the Student: BANDELA SHEENA PRIYA

Programme of Study: B.Sc.

Year of Study: 2022-2023

Group: Microbiology , Biotechnology and Chemistry (MBBTC)

Register No/H.T. No: 20205017

Name of the College: Dr. V. S. Krishna Government Degree & PG College (A), Visakhapatnam.

University: Andhra University, Visakhapatnam.

S.No.	Evaluation Criterion	Maximum Marks	Marks Awarded
1.	Project Log	10	
2.	Project Implementation	20	
3.	Project Report	10	
4.	Presentation	10	
GRAND TOTAL		**50**	

Date:
Seal:

Sign of the HR Manager/ Head of the division

Student Self-Evaluation of the Semester Internship

Student Name: BANDELA SHEENA PRIYA

Registration Number:20205017

Term of Internship:1 Month**From:-21-10- 2022 TO 21-11-2022**

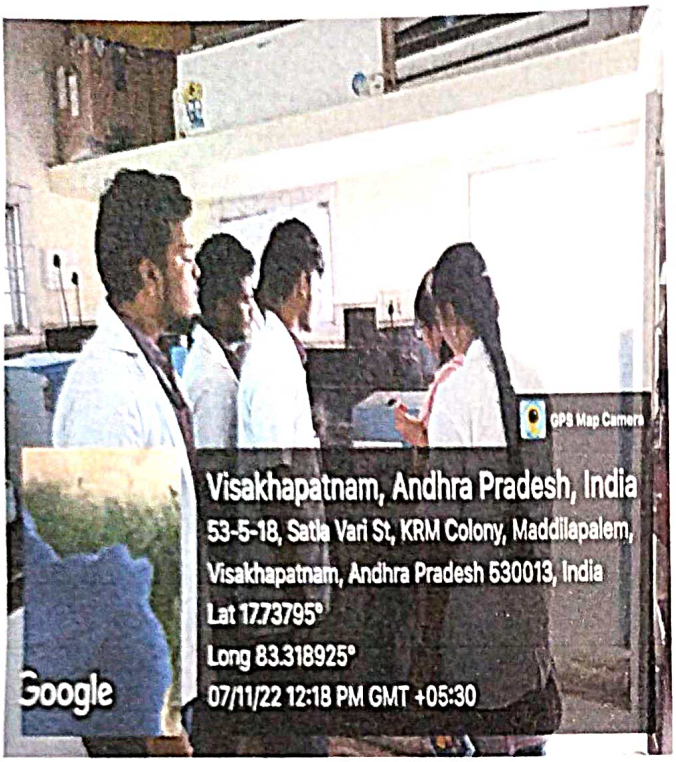
Date of Evaluation:

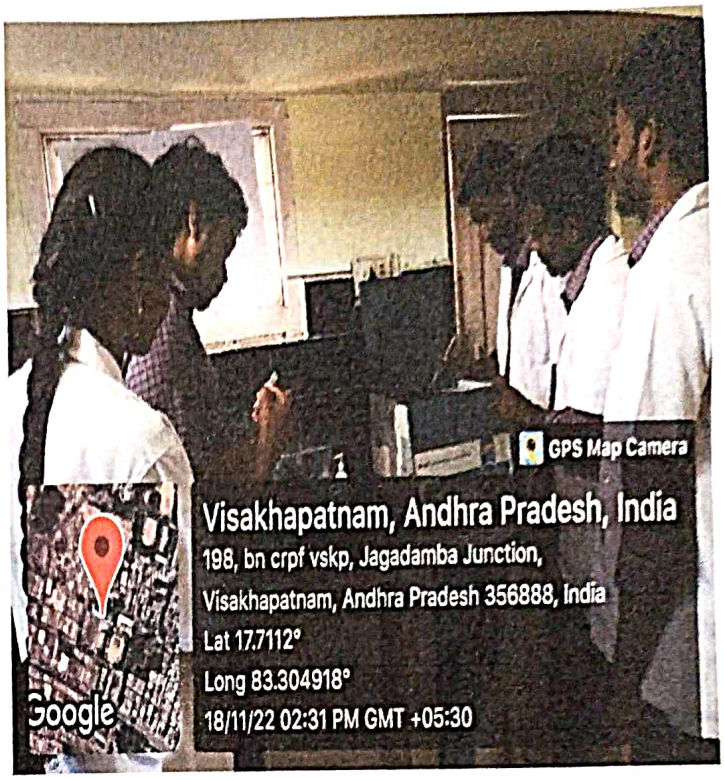
Organization Name & Address: Dr. V. S. Krishna Government Degree & PG College (A), Visakhapatnam.

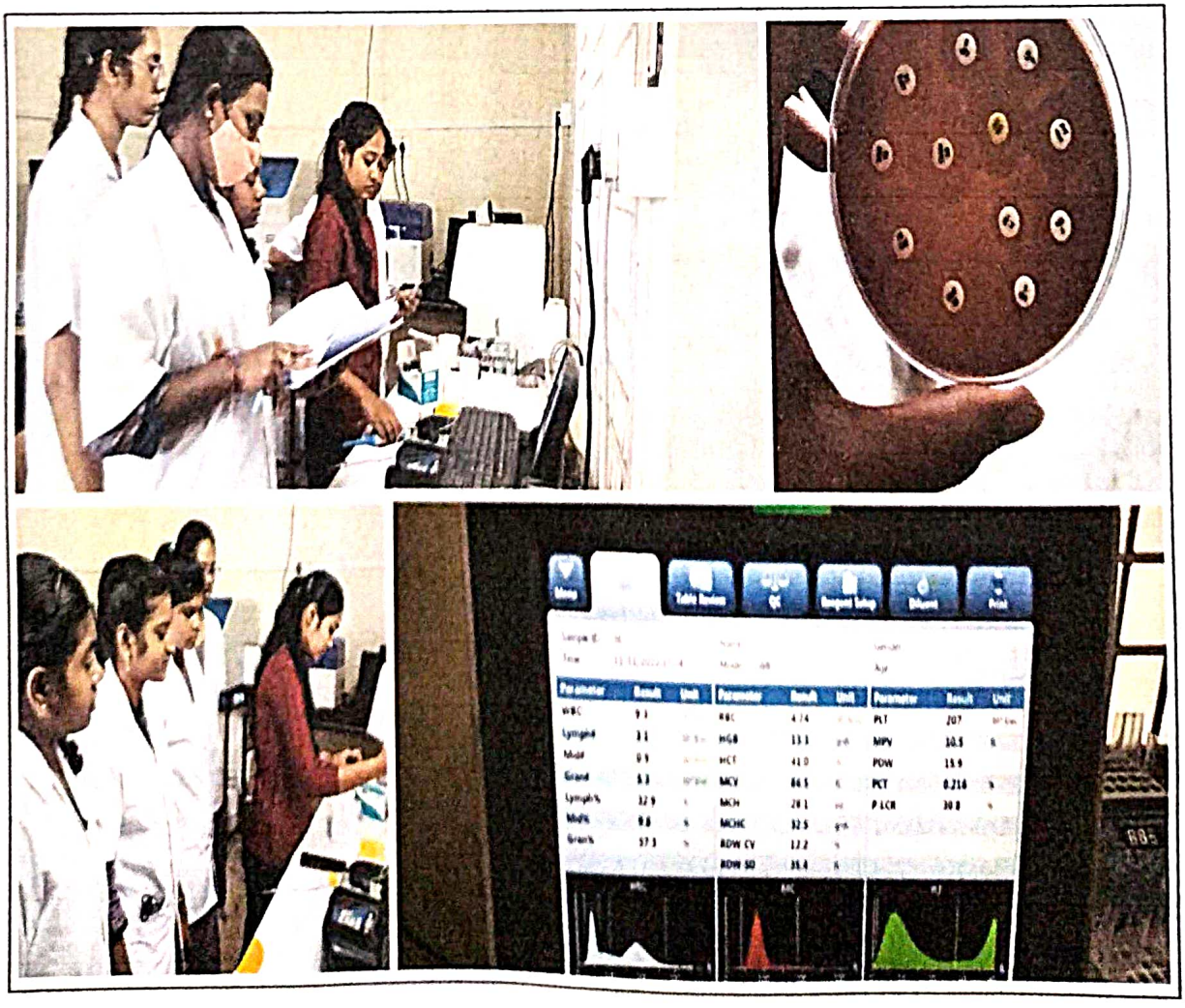
1	Oral communication	1	2	3	4	5
2	Written communication	1	2	3	4	5
3	Proactiveness	1	2	3	4	5
4	Interaction ability with community	1	2	3	4	5
5	Positive Attitude	1	2	3	4	5
6	Self-confidence	1	2	3	4	5
7	Ability to learn	1	2	3	4	5
8	Work Plan and organization	1	2	3	4	5
9	Professionalism	1	2	3	4	5
10	Creativity	1	2	3	4	5
11	Quality of work done	1	2	3	4	5
12	Time Management	1	2	3	4	5
13	Understanding the Community	1	2	3	4	5
14	Achievement of Desired Outcomes	1	2	3	4	5
15	OVERALL PERFORMANCE	1	2	3	4	5

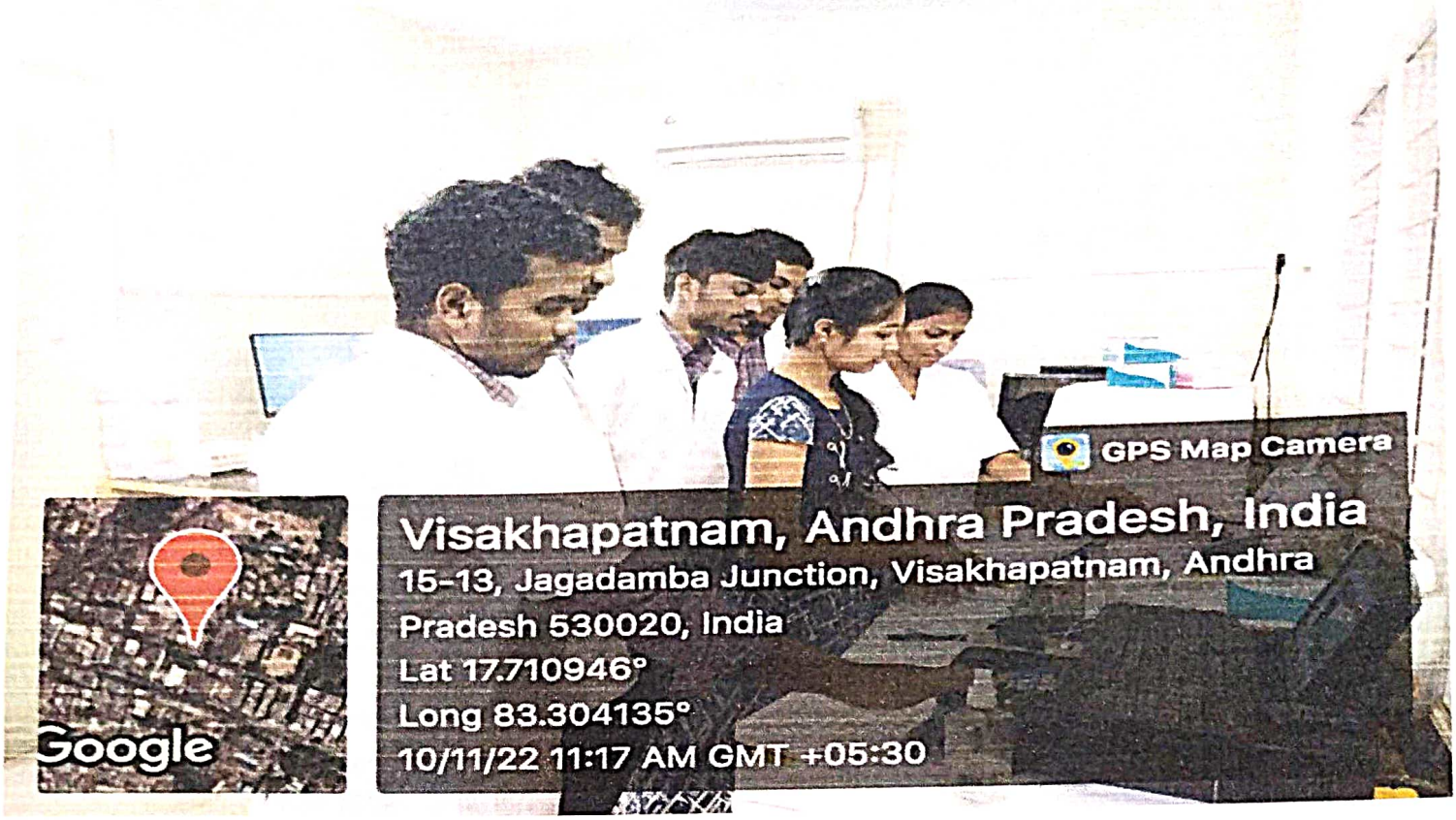
DATE: **Signature of the Student:**

Photographs





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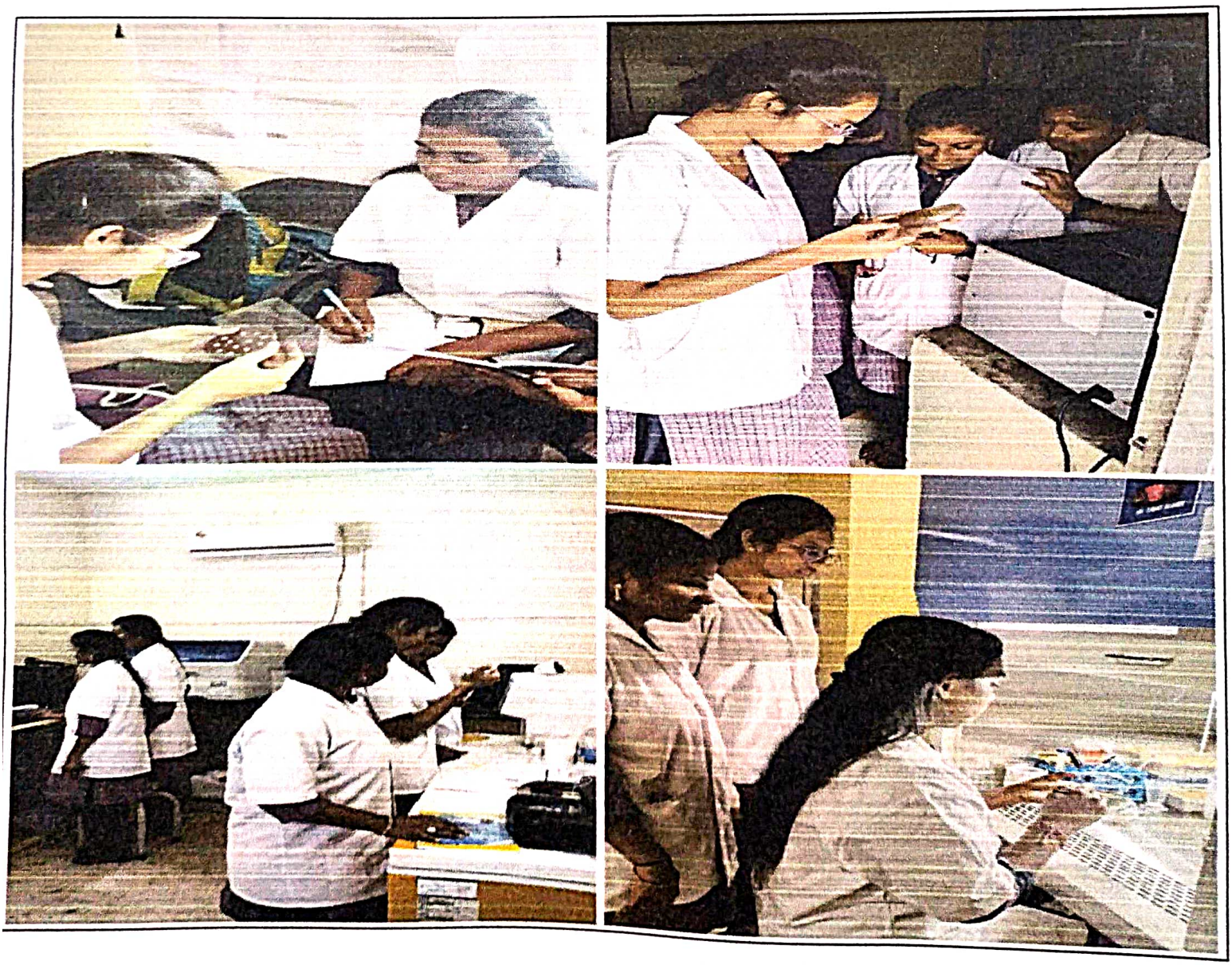


CLINICAL PATHOLOGY
URINE TEST

Part of the assessment of kidney function includes the measurement of urine and its contents.Abnormal kidney function may cause too much or too little urine to be produced. The ability of the kidneys to filter protein is often measured, as urine albumin or urine protein
levels.measured either at a single instance or, because of variation throughout the day, as 24-hour urine tests.There another test of the urine is a cost-effective screening to evaluate color,appearance, volume, density, pH, glucose, proteins, blood cells, glucose, bile salts, pigments and infective elements in the urine. Presence of red blood cells, pus cells, and crystals may give an idea about kidney issues 24 hours urine Collection A 24-hour urine collection may be done on an outpatient basis. This means you go home the same day. Or it may be done during a hospital stay. Procedures may vary depending on your condition and your healthcare provider practices.

PROCEDURE :

Generally, a 24-hour urine collection follows this process:

1. You will be given 1 or more containers for collecting and storing your urine. A brown plastic container is typically used. A special pan that fits in the toilet or a urinal may be used to collect the urine. You will need to transfer the urine from the collecting container to the storage container. You will need to keep it cold.
2. The 24-hour collection may start at any time during the day after you urinate. But your health care provider may tell you when to start. It is common to start the collection the first thing in the morning. It is important to collect all urine in the following 24-hour period.
3. Don't save the urine from your first time urinating. Flush this first specimen, but note the time.This is the start time of the 24-hour collection.
4. All urine, after the first flushed specimen, must be saved, stored, and kept cold. This means
keeping it either on ice or in a refrigerator for the next 24 hour.
5. Try to urinate again at the same time, 24 hours after the start time, to finish the collection process. If you can't urinate at this time, it is OK.
6. Once the urine collection has been completed, the urine containers need to be taken to the lab as soon as possible. If you are doing the urine collection at home, you will be given instructions on how and where to take it.
7. Depending on your specific health problem, you may be asked to repeat the collection over
several days.

URINE ROUTINE TEST:

The urine routine test is analysed to diagnose various liver, kidney, and urinary tract diseases,
etc.The urine routine test is analysed in three ways, and your laboratory assistant may perform
either or all of them.

- Physical examination – To evaluate the urine for color and appearance.

❖ Chemical examination – To evaluate

1.pH of urine. An abnormal pH signifies kidney stones, urinary infections, chronic kidney disease, or certain kidney disorders.
2.Protein signifies damage of kidney's filtering unit by kidney disease.
3.Sugar signifies diabetes.
4.Pus cells are signs of infection.
5.Bilirubin signifies liver disease.
6.Blood indicates renal stones and requires further evaluation.
7.Creatinine gives an estimate of the concentration of the urine.
8.Nitrites or leukocyte esterase signifies urinary tract infection.
9.Ketones
10.Specific gravity.

❖ Microscopic examination – This includes examining a small amount of urine under a microscope, which evaluates & look for the following

1.Red blood cells indicate kidney diseases that damage the kidneys, kidney stones, infections,
bladder cancer, or a blood disorder like sickle cell disease.
2.White blood cells indicate an infection or inflammation in the kidneys, bladder, or other areas.
3.Bacteria indicates an infection in the body.
4.Crystals may signify kidney stones.
5.Casts may form as a result of kidney disorders.

COLLECTION OF URINE:

1.Before peeing, wash your intimate area. It will ensure other bacteria do not contaminate your urine.
2.A clean midstream is used to get accurate results. So, start peeing in the toilet, stop midstream, and collect your urine in the container.
3.Hand over your sample to the lab assistant using proper hygiene practices.

PROCEDURE:

1. Take a urine sample as above
2.Dip one of the sticks into the sample, making sure all the test zones on the stick are submerged.
3.Remove the stick, tap to remove excess urine and hold it horizontally so urine doesn't drip.
4.Check on the label of the dipstick bottle how long you need to wait (the length of time varies for the different tests below, usually from 30 seconds to 2 minutes).
5.After the relevant time, hold the dipstick up against the colour chart on the dipstick bottle.
6.Each test will be colour-coded and there will be several different shades of that colour. A darker shade indicates that there is more of the relevant substance – blood, glucose etc – in your urine.
7.Record the result next to the matching colour on the label – this may be given in the form of '+' signs or numbers.

RESULT: The results from the given urine sample is - 4.2mg/dl

CHEMILUMINESCENCE

ESTIMATION OF THYROID HORMONES

Three different reagents were used for the measurement of thyroid hormones; FT4, FT3, TSH.

Determination of thyroid hormones was done with the help of a specific antibody labeled with

Ruthenium complex. Streptavidin- coated micro particles (0.72ng/mL) was used as a common reagent for all the three tests.

FOR THE ESTIMATION OF TSH :

Reagent 1:

Biotinylated monoclonal anti-TSH antibody (mouse) 2.0 mg/L

Phosphate buffer: 100 mmol/L

pH 7.2

Reagent 2:

Monoclonal anti- TSH antibody (mouse/human) labeled with ruthenium complex (1.2 mg/L)

Phosphate buffer: 100 mmol/L

pH 7.

PRINCIPLE:

TSH assay is based on sandwich ELISA principle and the total duration of assay is 18 minutes

similar to that of other two thyroid hormones.

PROCEDURE:

- First incubation consists of 50 µL samples with Biotinylated monoclonal TSH- specific antibody and a monoclonal TSH-specific antibody labeled with ruthenium complex to form a sandwich complex.
- After Second incubation with Streptavidin-coated microparticles, the complex becomes bound to the solid phase via interaction of biotin and Streptavidin.
- The reaction mixture is then aspirated into the measuring cell where the microparticles are magnetically captured onto the surface of the electrode.
- Unbound substances are then removed by treatment with ProCell.
- Application of voltage to the electrode then induces chemiluminiscent emission which is measured by a photomultiplier.
- Final results are determined via a calibration curve.

FOR THE ESTIMATION OF SERUM FT4 :

Reagent 1: Polyclonal anti-T4 antibody (sheep) labeled with ruthenium complex (50ng/mL)

PHOSPHATE BUFFER: 100 mmol/L

Ph 7
Reagent 2: Biotinylated T4 (2.5ng/mL)
Phosphate buffer: 100 mmol/L
pH 7.0 FT4 is also estimated by competitive ELISA assay and the duration of test is 18 minutes.

PRINCIPLE :
The free fraction of the circulating thyroxine (T4) is considered to exert the main influence on
metabolic control.Consequently, the FT4 concentration is believed to be the most direct indicator of an individual's thyroid status. FT4 concentrations are generally depressed in hypothyroidism and raised in hyperthyroidism. Measurement of FT4 thus provides an aid to the differential diagnosis of thyroid disease.

PROCEDURE:
•First incubation of 15 µL sample and an anti-T3-specific antibody labeled with a ruthenium complex.
• After Second incubation with Biotinylated T3 and Streptavidin-coated microparticles the remaining free binding sites of the labeled antibody becomes occupied and forms an antibody-hapten complex
•The reaction mixture is then aspirated into the measuring cell where the microparticles are magnetically captured onto the surface of the electrode.
•Unbound substances are then removed by treatment with ProCell.
•Application of voltage to the electrode then induces chemiluminiscent emission which is measured by a photomultiplier.
•Final results are determined via a calibration curve.

FOR THE ESTIMATION OF SERUM FT3
Reagent 1:
Monoclonal anti-T3 antibody labeled with ruthenium complex (10ng/mL)
Phosphate buffer: 100 mmol/L
pH 7.0
Reagent 2:
Biotinylated T3 (2 ng/mL)
Phosphate buffer: 100 mmol/L
pH 7.0

PRINCIPLE:
FT3 estimation is based on competitive ELISA principle and the total duration of assay is 18
minutes.

PROCEDURE :
•First incubation of 15 µL sample and an anti-T3-specific antibody labeled with a ruthenium complex.

•After Second incubation with Biotinylated T3 and Streptavidin-coated microparticles the remaining free binding sites of the labeled antibody becomes occupied and forms an antibody-hapten complex.
•The reaction mixture is then aspirated into the measuring cell where the microparticles are magnetically captured onto the surface of the electrode.
•Unbound substances are then removed by treatment with ProCell.
•Application of voltage to the electrode then induces chemiluminiscent emission which is Unbound substances are then removed by treatment with ProCell.
•Application of voltage to the electrode then induces chemiluminiscent emission which is measured by a photomultiplier.
•Final results are determined via a calibration curve

RESULT:
TOTAL TRIIODOTHYRONINE (T3) - 1.02 ng/ml
TOTAL THYROXINE (T4) - 8.12 ug/dl
THYROID STIMULATING HORMONE (TSH) - 4.23 uIU/ml

BIOCHEMISTRY

LIPID PROFILE TEST

A lipid panel is a blood test that measures the amount of certain fat molecules called lipids in your blood. In most cases, the panel includes four different cholesterol measurements and a measurement of your triglycerides.

PRINCIPLE :

Cholesterol :
1.Cholesterol esters are enzymatically hydrolysed by cholesterol esterase to Cholesterol and free fatty acids.
2.Free cholesterol, including that originally present, then oxidized by cholesterol oxidase to cholest-4-en-3-one and hydrogen peroxide.
3.The hydrogen peroxide combines with 4-aminoantipyrine to form a chromophore (quinoneimine dye) which may be quantitated at 505 nm

Triglycerides :
Triglycerides are enzymatically hydrolyzed by lipase to free acids and glycerol.The glycerol is phosphorylated by adenosine triphosphate (ATP) with glycerol kinase (GK) to produce glycerol-3-phosphate and adenosine diphosphate (ADP).Glycerol-3-phosphate is oxidized to dihydroxy-acetone phosphate (ADP) by glycerol Phosphate oxidase producing hydrogen peroxide (H2O2).In a Trinder type colour reaction catalyzed by peroxidase, the H2O2 Reacts with 4-aminoantipyrine (4AAP) and 4-chlorophenol to produce a red coloured dye. The absorbance of this dye is proportional to the concentration present in the Sample.

REQUIREMENTS:
Same as glucose.

Reagents :

Triglycerides.
- Good's buffer (pH 7.2) 50 mmol/l.
- 4-Chlorophenol 4 mmol/l

- Mg 2+ 15 mmol/l.
- ATP 2 mmol/l.
- Glycerol Kinase ≥ 0.4 KU/l.
- Peroxidase ≥ 2.0 KU/l.
- Lipoprotein Lipase ≥ 2.0 KU/l.
- Glycerol-3-phosphate-Oxidase ≥ 0.5 KU/l.
- 4-Aminoantipyrine 0.5 mmol/l.

Cholesterol.

- Good's Buffer - 50 mmol/.
- Phenol - 5 mmol/l.
- 4-aminoantipyrine - 0.3 mmol/l.
- Cholesterol esterase ≥ 200 U/l.
- Cholesterol oxidase ≥ 50 U/l.
- Peroxidase ≥ 3 kU/l.
- R2 standard present for both.

PROCEDURE :

1.Take 1 ml of blood sample after that centrifuge.
2 Take 2 test tubes, in 1 test tube add 500 microliters of cholesterol Reagent and in 2 test tube add 500 microliters of tri Reagent.
3. Collect 5 microliters of serum and add to cholesterol and triglycerides test tubes incubate for 5 minutes.
4.Read Result

Calculation :

- Cholesterol - 115/4 = 28.75 = HDL.
- Triglycerides – 138/5 = 27.6 = VLDL.
- HDL VLDL- Cholesterol= LDL= - 59.4.

Results :

- Cholesterol – 115 mg/ dL.
- Triglycerides – 138 mg/ dL.
- HDL – 28.75 mg/ dL.
- VLDL- 27.6 mg/ dL.
- LDL- 59.4 mg/ dL.

RENAL FUNCTION TEST (RFT)

Renal function tests (RFT) are a group of tests that may be performed together to evaluate kidney (renal) function. The tests measure levels of various substances, including several minerals, electrolytes, proteins, and glucose (sugar), in the blood to determine the current health of the kidneys.

If the kidneys are not functioning properly, waste products can accumulate in the blood and fluid levels can increase to dangerous volumes, causing damage to the body or a potentially life-threatening situation. Numerous conditions and diseases can result in damage to the kidneys. The most common causes of and main risk factors for kidney disease are diabetes and hypertension

- Indications for the assessment of renal function are varied and range from acute emergency to chronic settings.
- Renal function tests are performed to identify the renal disease to determine appropriate patient management and prevent further deterioration of renal function.
- Further indications in patients in whom the renal disease has been identified are to stage level or type of renal disease and to monitor the progression of renal disease to ensure that optimal management occurs and to monitor response to interventions.

TYPES OF RENAL FUNCTION TESTS

- Clinically, the most practical tests to assess renal function is to get an estimate of the glomerular filtration rate (GFR) and to check for proteinuria (albuminuria).

- Electrolytes – electrically charged chemicals that are vital to normal body processes, such as nerve and muscle function; among other things, they help regulate the amount of fluid in the body and maintain the acid-base balance.

Electrolytes include:

Sodium

Potassium

Chloride

Bicarbonates.

- Glucose – supplies energy for the body; a steady amount must be available for use, and a relatively constant level of glucose must be maintained in the blood.
- Albumin – a protein that makes up about 60% of protein in the blood and has many roles such as keeping fluid from leaking out of blood vessels and transporting hormones, vitamins, drugs, and ions like calcium throughout the body.
- Creatinine: Serum creatinine is elevated when there is a significant reduction in the glomerular filtration rate or when urine elimination is obstructed. About 50% of kidney function must be lost before a rise in serum creatinine can be detected. Thus serum creatinine is a late marker of acute kidney injury.
- BUN : Serum urea/BUN level increases in acute and chronic renal dialysis.

SYMPTOMS OF RENAL PROBLEMS :

- High blood pressure
- Blood in the urine
- Frequent urges to urinate
- Swelling of the hands and feet due to a buildup of fluids in the body
- Painful urination

REQUIREMENTS :

Syringe ,Spirit ,Cotton ,Plain tube ,Tourniquet, Biochemistry analyser

ALBUMIN TEST

An albumin blood test checks your liver and kidney function. Albumin is protein in your blood plasma. Low albumin levels might be the result of kidney disease, liver disease, inflammation or infections. High albumin levels are usually the result of dehydration or severe diarrhea.Albumin levels can also indicate underlying nutritional deficits, especially decreased protein in your diet. Normal range of albumin in blood is 3.3-5.5 g/dl.

Symptoms of kidney disease may include:

- Appetite loss.
- Frequent urination
- Fatigue
- Itchy & dry skin
- Muscle cramps
- Nausea & vomiting
- Swelling in your foot and ankle
- Urine change, like bloody, foamy or dark urine

PROCEDURE :

- Tie the tourniquet around the patients elbow
- Cleaned the surface of hand with spirited cotton
- Take the sterilized syringe and draw the blood of patient
- Transformed the blood from syringe to plain tube and kept a side
- After 5 minutes the blood sample is centrifuged

GLUCOSE

Blood sugar testing is an important part of diabetes care.If you have diabetes, self-testing your blood sugar (blood glucose) can be an important tool in managing your diabetes and preventing complications. You can use a device called a continuous glucose monitor (CGM). Or you can test your blood sugar at home with a portable electronic device called a blood sugar meter using a small drop of your blood. The frequency of testing usually depends on the type of diabetes you have and your treatment plan.

Type 1 diabetes

Your health care provider may recommend blood sugar testing 4 to 10 times a day if you have type 1 diabetes. You may need to test:

- Before meals and snacks
- Before and after exercise
- Before bed
- During the night (sometimes)
- More often if you're ill
- More often if you change your daily routine
- More often if you start a new medication

Type 2 diabetes

If you manage type 2 diabetes with noninsulin medications or with diet and exercise alone, you may not need to test your blood sugar daily.

PROCEDURE :

- Cleaned the surface of patients hand in the place where blood is taken
- Blood is drawn with the sterilized syringe
- Transformed the blood from syringe to test tube
- Centrifuged the blood sample for 5 minutes

- After that added a 1000 microliters glucose solution in a another test tube
- And added a 10 microlitres of serum in the glucose solution
- Kept it under incubation for 10 minutes
- By using biochemistry analyser read the results and noted down

RESULTS :

GLUCOSE - 281 MG/dl

CREATININE

Creatinine is a waste product made by your muscles as part of regular, everyday activity. Normally, your kidneys filter creatinine from your blood and send it out of the body in your urine. If there is a problem with your kidneys, creatinine can build up in the blood and less will be released in urine. If blood and/or urine creatinine levels are not normal, it can be a sign of kidney disease. You may need this test if you have symptoms of kidney disease. These include:

- Fatigue,Puffiness around the eyes ,Swelling in your feet and/or ankles,,Decreased appetite
- Frequent and painful urination ,Urine that is foamy or blood

RESULT :

SERUM CREATININE - 1.0 mg/dl

RANDOM BLOOD SUGAR - 141 mg/dl

URIC ACID

Uric acid is a metabolite of purines, Nucleic acid and nucleo proteins. Consequently, abnormal levels may be indicative of a disorder in the metabolism of these substances. Increased levels of serum uric acid are observed in Renal dysfunction, leukemia, diabetes, genetic diseases. Uric acid concentration decreases in patients with Wilson's disease.

REAGENG :

- Reagent 1 Uric Acid
- 4- amino anti pyrine – 0.5 mmol /L
- TBHB – 1.75 mmol /L
- Uricase - >120 U/L
- Peroxidase - >500U/ L
- Tris Buffer PH 8.25 + 0.1 at 20° - 50 mmol / L.
- Uric acid standard - 6 mg/ dL.

PROCEDURE :

1. Take 1 ml of blood sample centrifuge for 2-3 minutes (3000-4000)RPM.
2. Take another test tube add 500 micro liters of Uric acid Reagent.
3. Add 5 microliters of serum and incubate for 5 minutes after that read the results.

RESULT :

2.8 mg/dl

LIVER FUNCTION TEST

Liver function tests are blood tests used to help diagnose and monitor liver disease or damage. The tests measure the levels of certain enzymes and proteins in your blood.

Some of these tests measure how well the liver is performing its normal functions of producing protein and clearing bilirubin, a blood waste product. Other liver function tests measure enzymes that liver cells release in response to damage or disease.

REQUIREMENTS :

- Cotton
- Spirit
- Syringe
- Micropipette
- Microtips
- Centrifuge
- Biochemistry analyser

REAGENTS :

- Bilirubin reagent
- Serum glutamin pyruvate transaminase
- Serum glutamine oxalate transaminase
- Alkaline phosphatase
- Albumin

Liver function tests check the levels of certain enzymes and proteins in your blood. Levels that are higher or lower than normal can indicate liver problems. Some common liver function tests include:

BILIRUBIN

Bilirubin is a substance produced during the normal breakdown of red blood cells. Bilirubin passes through the liver and is excreted in stool. Elevated levels of bilirubin (jaundice) might indicate liver damage or disease or certain types of anemia.

PROCEDURE :

- Collected the blood sample from patient with the sterilized syringe
- Transformed the blood in a test tube
- Centrifuged the blood sample in a separate test tube for 5 minutes
- Took another 2 test tubes and added 500 microlitres of total bilirubin reagent in one test tube and 500microlitres of direct bilirubin reagent in another test tube
- Again added 10 microlitres of R3 reagent in total bilirubin reagent and 5 microlitres of R3 reagent in direct bilirubin reagent
- Added 25 microlitres of serum in both test tubes
- Kept it under room for 10 minutes
- And then noted the results in biochemistry analyser

RESULTS :

Bilirubin = 1.2 mg/dl

ALKALINE PHOSPHATASE (ALP)

ALP is an enzyme found in the liver and bone and is important for breaking down proteins. Higher-than normal levels of ALP may indicate liver damage or disease, such as a blocked bile duct, or certain bone diseases

PROCEDURE :

- Take 1ml of blood from patient
- Centrifuged blood after 15 minutes
- Took new test tube and added alkaline phosphatase in it
- Again added serum in it
- Kept it under dark room for 10 minutes
- Noted down the results in the biochemistry analyser

RESULTS :

5.0 gm/dl

ALBUMIN AND TOTAL PROTEIN

Albumin is one of several proteins made in the liver. Your body needs these proteins to fight infections and to perform other functions. Lower-than-normal levels of albumin and total protein may indicate liver damage or disease.

PROCEDURE :

- Drawn the blood from patient with sterilized syringe
- Centrifuged it for 5 minutes
- Another test tube is taken and added the albumin solution in it
- And then added the serum in it
- Incubated it for 5 minutes
- Read the results in the biochemistry analyser

RESULTS :

12 gu/l

COMPLETE BLOOD COUNT (CBC)

PRINCIPLE :

The complete blood count (CBC) is an essential blood panel that allows your doctor tc evaluate each type of cell in your blood. The CBC measures the number of red blood cell(RBC), white blood cell (WBC)and platelet count. These types of blood cell performs important functions ,so determining their levels can provide important health information

CONTENTS OF CBC :

★ HEMOGLOBIN count

★ total leukocyte count(TLC)

★ Differential leukocyte count (DLC)

1) Neutrophils
2) Lymphocytes
3) Eosinophils
4) monocyte s

Total Red Blood Cells (TRBC)

- platelet count
- Packet cell volume
- Mean cell volume (MCV)
- Mean Cell Hemoglobin (MCH)
- Mean Cell Hemoglobin (MCHC)

HEMOGLOBIN :

Measures the amount of this oxygen carrying protein is formed inside RBCS

DIFFERENTIAL LEUKOCYTE COUNT :

- A Stander CBC includes measures of the WBC Count which is the total number of wbc in a sample blood
- the differential leukocyte breakdown of the amount each five different types of WBC .

Neutrophils :

Neutrophils make up the greatest percentage of WBCS and are produced by the bone marrow array of inflammatory and infection

Lymphocytes :

Lymphocytes such as B-cell and T-cell are found primarily in the lymph system and fight bacteria and other pathogens in the blood.

Monocytes :

monocyte s work in conjunction with neutrophils to combat infections and other illness while removing damaged or dead cell

Eosinophils :

eosinophils are WBC activated in response to allergies a same types of infections

Basophils :

basophils are involved in the early identification of infections as well as wound repair and allergic reactions

REQUIREMENTS :

Cotton ,spirit ,syringe, tourniquet , micro-pipette, micro-tips

PROCEDURE :

- There are several steps that you can expect during a needle blood draw for a CBC.
- Antiseptic alcohol wipe is used to clean your arm in the area that needle will be inserted .
- To make the vein in your arm more visible and easier to Access with a needle a band called a tourniquet is tied around your upper arm
- A needle is placed in your vein and a test tube attached to the needle filled with blood .
- After the test tube is filled the needle is removed and the test is over .

RESULTS :

Depending on the laboratory equipment that is used, results from a CBC can be available in a few minutes to a few days after a blood sample arrives at the laboratory.

Haemoglobin	- 10.0
(WBC) TLC	- 9.100
DLC	-
NEUTROPHILES	- 41
LYMPHOCYTES	- 51
EOSINOPHILS	- 7
MONOCYTES	- 01
TRBC	- 5.58
PLATELETS COUNT	- 4.14
PCV	- 35.2
MCV	- 63.1
MCH	- 17.9
MCHC	- 28.3

BLOOD GROUPING

INTRODUCTION :

- The ABO system is the first recognized blood group system in humans.
- In 1901 Karl Landsteiner showed that an individual serum contained ABO antibodies. corresponding to the antigen which is lacking on his red blood cells RBCS .

PRINCIPLE : The procedures used with the antisera are based on the principle of agglutination. Normal human red cell possessing antigens well clump on the presence of corresponding antibody

REQUIREMENTS :

1) Glass slide ,pasteur pipette,applicator sticks

REAGENTS :

Anti – A
sera
Anti - B
sera

Anti - D

PROCEDURE :

1) First take a glass slide and mark three circles on it after cleaned the slide.
2) With the help of a dropper added the Anti- A , Anti -B , Anti -D in three circles.
3) Keep the slide aside safely without distributing.
4) You need to wipe the ring finger with the alcohol swabs and rub gently near the fingertip,where the blood samples were collected.
5) You need to prick the ring finger tip with the lancet and wipe off the first drop of ht blood.
6) As blood starts flowing out and allows it to fall.
7) On the three circles of the glass slide by gently pressing the fingertip.

8)Mix the blood sample gently with the help of a tooth pick and wait for a minute to observe the result.

1) Group -A Antigen 'A' and antibody 'B'
2) Group -B Antigen 'B' and Antibody' A'
3) Group AB Antigen A and B both are present and no antibodies
4) Group - O Antigens are absent and both A and B Antibodies are present

RESULT: IN THIS BLOOD SAMPLE
B + BLOOD GROUP

QUANTITATIVE BUFFY COAT FOR MALARIAL PARASITE

The QBC (Quantitative Buffy Coat) Malaria test is a revolutionary in malaria and other blood borne parasite testing technology. This test is a microscopic test and is easier as it contains all the staining agents in a single tube.This test is a sensitive and specific test which can be performed by any technician who can work with thick and thin films. This is the easiest and fastest test when compared to all the other tests since it takes only 6-7 minutes to prepare the test tube for the test.

PRINCIPLE :

QBC for detecting malaria parasites is based on using specialized capillary tube containing a plastic float. Blood containing capillaries are centrifuged at high speed for 5 minutes. The plastic float which has the same specific gravity as that of the buffy layer automatically gets positioned within the buffy coat layer, between the packed red cells and the plasma. During centrifugation, the components of the buffy coat separate according to their densities, forming discrete bands. Platelets constitute the topmost layer, lymphocytes and monocytes the middle layer, and granulocytes, being the heaviest of the buffy coat cells, concentrate immediately above the packed red cells. You may need this test if you live or have recently traveled to an area where malaria is common and you have symptoms of malaria. Most people will have symptoms within 14 days of being bitten by an infected mosquito. But symptoms can show up as soon as seven days afterward or can take as long as a year to appear. In the early stages of infection, malaria symptoms are similar to the flu, and may include:

- Fever
- Chills
- Fatigue
- Headache
- Body aches
- Nausea and vomiting

REQUIREMENTS :

- QBC tube
- EDTA
- Glass slide
- Centrifuge

- ❖ Immersion oil
- ❖ Microscope

PROCEDURE :

- ➢ Blood sample has taken from the patient
- ➢ QBC tube was filled with Blood from top to EDTA
- ➢ Blood was mixed with anticoagulant
- ➢ Tubes were centrifuged for 5 minutes
- ➢ Centrifuged sample was taken on the clean glass slide
- ➢ An immersion oil of 2 drops was added on slide
- ➢ Slide was adjusted under microscope until the layer of blood cells are able to see
- ➢ Examined the slide under microscope for 10 minutes for clear results

RESULTS:

A Line in letter c and letter T means the patient is positive for malaria.

HEPATITIS B SURFACE ANTIGEN (HBsAg)

INTRODUCTION :

The Hepatitis B surface antigen (HBsAg) test is used to detect the presence of hepatitis B surface antigens in blood of an individual. This test can be used to screen for the virus that causes hepatitis B or to determine if an individual is actively infected with the virus. The HBsAg test is usually performed as part of a panel of tests, such as the hepatitis B panel, which also includes tests for other hepatitis viruses.

The HBsAg test is used to screen for hepatitis B infection and to help diagnose acute or chronic hepatitis B. This test can also be used to monitor people who are at risk for hepatitis B infection, such as people with HIV or those who have been exposed to the virus.

Hepatitis B is a serious viral infection that affects the liver. The hepatitis B virus (HBV) is spread through contact with the blood or other body fluids of an infected person.Most people with hepatitis B have no symptoms and do not know they are infected. However, HBV can cause acute or chronic liver diseases, including cirrhosis and liver cancer.

Acute Hepatitis B Virus:

Acute hepatitis B infection is a serious viral infection that can cause liver damage. The doctor may recommend the HBsAg test if the individual have symptoms of acute hepatitis B like:

- fatigue
- fever
- abdominal pain
- dark urine
- yellowing of your skin or eyes (jaundice)

The individual may also be tested for HBsAg if he/she have been exposed to the virus, such as through unprotected sex or sharing needles.

Chronic Hepatitis B Virus:

Chronic hepatitis B infection is a serious disease that can lead to:

- liver failure
- liver cancer

- death

The hepatitis B surface antigen (HBsAg) test is used to detect the presence of the HBsAg protein on the surface of the hepatitis B virus. This protein is produced by the virus and is used to infect healthy cells. If the HBsAg test is positive, it means that the individual has a chronic hepatitis B infection and requires treatment.

PRINCIPLE :

HBsAg card test utilizes the principle of immunochromatography, a unique assay based on antigen capture or sandwich principle. The method uses monoclonal antibodies conjugated to colloidal gold and polyclonal antibodies immobilized on nitrocellulose strips in a thin line. As the test sample flows through the membrane assembly of the test device, the coloured monoclonal anti-HBsAg-colloidal gold conjugate complexes with the HBsAg in the sample. This complex moves further on the membrane to the test region where it is immobilized by a polyclonal anti-HBsAg antiserum coated on the membrane leading to formation of a pink-purple coloured band. The formation of the first purple band (T zone) confirms a positive test result. Absence of this coloured band in the test region indicates a negative test result. The unreacted conjugate and unbound complex, if any, move further on the membrane and are subsequently immobilized by the anti-rabbit IgG coated on the membrane at the control region, forming a pink-purple band. This control band serves to validate the test results.

REQUIREMENTS :

1. A HBsAg card test kit
2. Alcohol swab
3. Micro pipette
4. Syringe/lancet
5. Diluent liquid

PROCEDURE :

i. The surface of the finger should be sterilized with an alcohol swab in order to avoid any microorganism present on the finger's surface to enter the bloodstream.

ii. Prick the finger with a lancet or a syringe.

iii. Squeeze out the blood and collect it using a micropipette.

iv. Drop 2-3 drops of blood into the HBsAg card well.

v. Add the 2-3 drops of the diluent liquid slowly into the well.

vi. Wait for 15 minutes for the mixture to react and slide onto the card.

vii. After 15 minutes purple bands will be formed on the card.

viii. This concludes the end of the test. Results should be determined using the bands formed on the card.

INTERPRETATION :

On the card a band forms near the control. This is the standard indication that the device works just fine. The positive or negative results are determined if there is a formation of another band on the test region along with the control region.

For a positive result : The band appears near both control and test regions.

For a negative result : The band appears only at the control region

It is also necessary that a band should be formed near the control region. If there is no band formation

near the control region when the blood is dropped along with the diluent liquid, it indicates that the test card is faulty.

RESULTS:

HBSAG kit indicates that the person is infectious ,except when it might be transiently positive and the

person infected with hepatitis.

DENGUE

Dengue fever is a mosquito-borne tropical disease caused by the dengue virus. Symptoms typically begin three to fourteen days after infection. These may include a high fever, headache, vomiting, muscle and joint pains, and a characteristic skin itching and skin rash. Recovery generally takes two to seven days. In a small proportion of cases, the disease develops into a more severe dengue haemorrhagic fever, resulting in bleeding, low levels of blood platelets and blood plasma leakage, or into dengue shock syndrome, where dangerously low blood pressure occurs.

Typically, people infected with dengue virus are asymptomatic (80%) or have only mild symptoms such as an uncomplicated fever. Others have more severe illness (5%), and in a small proportion it is life threatening. The incubation period (time between exposure and onset of symptoms) ranges from 3 to 14 days, but most often it is 4 to 7 days. Therefore, travellers returning from endemic areas are unlikely to have dengue fever if symptoms start more than 14 days after arriving home. Children often experience symptoms similar to those of the common cold and gastroenteritis (vomiting and diarrhea) and have a greater risk of severe complications, though initial symptoms are generally mild but include high fever.

SYMPTOMS :

The most common symptom of dengue is fever with any of the following:

- Nausea, vomiting,Rash
- Aches and pains (eye pain, typically behind the eyes, muscle, joint, or bone pain)
- Mild symptoms of dengue can be confused with other illnesses that cause fever, aches and pains, or a rash.

NS1Ag test :

The dengue NS1 test is used to diagnose dengue fever early. The test detects the presence of dengue

NS1 antigen in the blood. In laboratories, the ELISA (Enzyme-Linked Immunosorbent Assay) approach is employed to detect the virus. The protein creates antibodies to attack the illness, triggering an immunological response. The NS1 antigen is detected in their blood when infected with dengue fever. As a result, the test aids in the early diagnosis of dengue fever.

PRINCIPLE :

Dengue NS1 Rapid Test Cassette is a qualitative membrane-based immunoassay for the detection of Dengue NS1 antigen in whole blood, serum, or plasma. During testing, the specimen reacts with Dengue antibody-conjugate in the test cassette. The antibody conjugate will bind to Dengue antigen in the specimen sample which in turn will bind with Anti-Dengue NS1 coated on the membrane.

A Gold s the reagent moves across the membrane, the Dengue NS1 antibody on the membrane will bind the antibody-antigen complex causing pale or dark coloured line to form at the test line region of the test membrane. The intensity of the lines will vary depending upon the amount of antigen present in the sample. The appearance of a coloured line in the test region should be considered as positive result.

REQUIREMENTS :

- Rapid test kit of NS1Ag
- NS1Ag buffer
- Micropipette
- Microtips

PROCEDURE :

- Collected the blood sample of patient
- I have taken NS1Ag kit out of pack
- And then added patients sample to the kit with micropipette
- Immediately Added 2 drops of NS1Ag buffer to kit
- Incubated it for 15 minutes for the result

IgM/IgG test :

REQUIREMENTS :

- Rapid test kit of IgM&IgG
- IgG&IgM buffer
- micropipette
- Microtips
- Stop watch

PROCEDURE:

- Collected the blood sample of patient
- I have taken IgM kit for test
- I had added patients blood sample on kit by using micropipette
- Immediately added 2 drops of IgM buffer to kit And then incubated it for 15 minutes

RESULT :

The test found genetic material from the virus is present in blood sample the result shows positive

C-REACTIVE PROTEIN (CRP)

A c-reactive protein test measures the level of c-reactive protein (CRP) in a sample of your blood. CRP is a protein that your liver makes. Normally, you have low levels of c-reactive protein in your blood. Your liver releases more CRP into your bloodstream if you have inflammation in your body. High levels of CRP may mean you have a serious health condition that causes inflammation. A CRP test may be used to help find or monitor inflammation in acute or chronic conditions, including:

Infections from bacteria or viruses Inflammatory bowel disease, disorders of the intestines that include Crohn's disease and ulcerative colitis Autoimmune disorders, such as lupus, rheumatoid arthritis, and vasculitis, Lung diseases, such as asthma

PRINCIPLE :

The C-Reactive Protein test is based on the principle of the latex agglutination. When latex particles complexed human anti-CRP are mixed with a patient's serum containing C reactive proteins, an visible agglutination reaction will take place within 2 minutes.

PROCEDURE :

- Brought all reagents and serum sample to Room Temperature and mixed latex reagent gently prior to use. Without controls and serum.

- Placed 1 drop of Serum, Positive control and Negative control on separate reaction circle on glass slide.
- Then added 1 drop of CRP latex reagent to each of the circles.
- Mixed with separate mixing sticks and spread the fluid over the entire area of the cell.
- Tilted the slide back and forth slowly for 2 minutes observing preferably under artificial light.
- Observed the slide for visible agglutination.

RESULT : *CRP = 7.796mg/dl*

ANTIBIOTIC SENSITIVITY

An antibiotic sensitivity test is used to aid choose the appropriate antibiotic to treat a bacterial illness. It can also be used to determine which treatments are most effective against certain bacterial and other microbial infections.

BASIC TYPES OF ANTIBIOTIC SENSITIVITY TESTS :

1. **BROTH DILUTION TEST**- The macro broth or Broth dilution method was one of the first antibiotic sensitivity testing procedures. Preparing two-fold dilutions of antibiotics in a liquid growth medium delivered in test tubes was required for this process. A uniform bacterial suspension was introduced into the antibiotic- containing tubes. The tubes were checked for evident bacterial growth as shown by turbidity after overnight incubation at the temperature of 35°C. The least inhibitory concentration was defined by the lowest concentration of antibiotics that halted growth (MIC).

2.. Due in significant part to the practice of physically producing repeated dilutions of the antibiotics, the accuracy of this procedure was judged to be plus or minus 1 two-fold concentration. The main disadvantages of the Broth dilution method of Antibody sensitivity tests were the time-consuming, manual task of preparing antibiotic solutions for each test, the risk of material misstatement in antibiotic solution preparation, and the relatively large quantity of reagents and space required for each test.

3. ANTIMICROBIAL GRADIENT METHOD -As a technique of measuring susceptibility, the antimicrobial gradient diffusion method employs the notion of establishing an antibiotic concentration gradient in an agar medium. The gradient diffusion method is intrinsically flexible in that it may test any medications that the laboratory chooses. If more than a few medications are examined, antimicrobial gradient strips can be a costly technique. This approach is most suited for cases where a MIC for only one or two medicines is required, or for testing an organism that requires an enriched medium or a particular incubation environment.

4. DISC DIFFUSION ANTIBIOTIC SENSITIVITY TEST-The disk diffusion antibiotic sensitivity method is straightforward, practical Sensitivity te, and well- standardised. The advantages of the disk approach include test simplicity (no special equipment required), presentation of categorical data that are simply

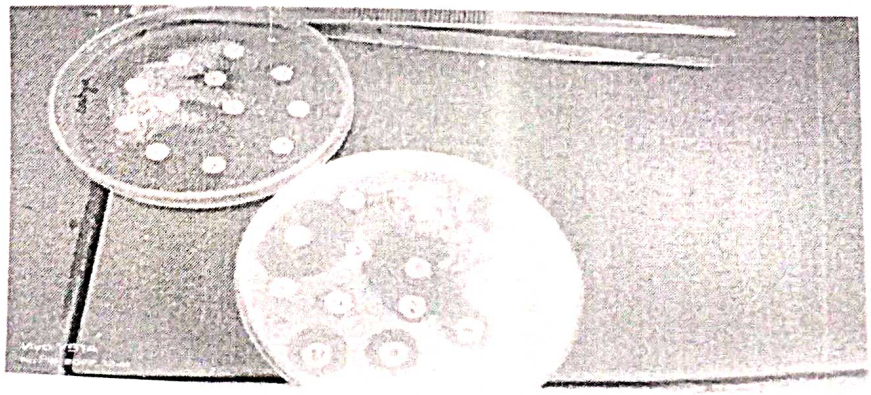
comprehended by all doctors, and freedom in the selection of discs for testing. It is the least expensive of all the other sensitivity approaches. Disk diffusion sensitivity test is one of the most effective antibiotic sensitivity test methods.

REQUIREMENTS :

1. Nutrient agar / Antibiotics assay plates
2. Culture for sensitivity testing
3. Antibiotic Discs
4. Cotton swabs
5. Forceps
6. Tubes
7. Other lab requirements

PROCEDURE :

1. Isolate the test organism in pure culture.Make a suspension of actively growing(over night) culture in broth.
2. Prepare antibiotic assay or nutrient agar plates.
3. swab inoculate the actively growing culture suspension evenly with the help of cotton swab over the agar plate.
4. Allow the agar plate to dry for 10 minutes .
5. Place the different antibiotic discs on the surface of agar with the help of sterile forceps and gently press to make proper contact with agar.
6. Incubate the plates at 37°C for 24 hours.
7. After the incubation, observe for growth inhibition zone around each disc measure the diameter of inhibition zone with the help of scale and determine the effective antibiotic tested compared with standard chart.



INTERPRETATION :

A "susceptible" result indicates that the patient's organism should respond to therapy with that antibiotic using the dosage recommended normally for that type of infection and species.

RESULT:

S/N	Antibiotics	Conc. (µg)	Zone of inhibition (mm)	Inference
1	Ampicillin	30	1.0±1.1	S
2	Streptomycin	30	1.3±0.6	R
3	Augmentin	10	1.4±0.8	S
4	Perfloxacin	30	1.3±0.1	R
5	Amoxicillin	30	1.3±0.9	S
6	Chloramphenicol	30	1.0±0.1	R
7	Gentamicin	30	1.0±0.0	R
8	Ofloxacin	10	1.6±0.5	S
9	Ciprofloxacin	30	1.1±1.7	S
10	Erythromycin	10	1.4±0.7	S

Key S Sensitive R Resistance