A

On Job Training Report On

Completed at

ADARSH CLINICAL

Laboratory

8/266, Vikram Nagar Rd, ARAGE MALA, Ichalkaranji,
Maharashtra 416115 Dist- Kolhapur.

By

Miss. Prachi Sanjay Mali

M. Sc. Microbiology Part I.

Semester II

PG Department of Microbiology Vivekanand College

(An Empowered Autonomous Institute) Kolhapur, 416003

Maharashtra, India

2025-26

Dissemination of Education for Knowledge, Science and Culture"

-Shikshanmaharshi Dr. Bapuaji Sahakhe

Shri Swami Vivekanand Shikshan Sanstha's

VIVEKANAND COLLEGE, KOLHAPUR

(ANEMPOWERED AUTONOMOUS INSTITUTE)

PG Department of Microbiology

CERTIFICATE

OF

"ON JOB TRAINING"

This is to certify that Prachi Sanjay Mali (Roll no.5413) has satisfactorily carried out the required practical work prescribed by the BoS Department of Microbiology, Vivekanand College, Kolhapur (An Empowered Autonomous Institute) for M.Sc. – Part- I Semester II course in On Job Training (Sub code – OJT20MIC21) and this report represents his/her Bonafide work in the year 2025- 2026.

Place: Kolhapur

Date: 23/3/2026

Examiner 23/3/26 25.03.26 | OJT in charge | Head

I/C Head
Department of Microbiology
Vivekanand College, Kolhapur
(Empowered Autonomous)

DECLARATION

I hereby declare that I have successfully completed the On Job Training program at Adarsh Clinical Laboratory. I acknowledge that skills acquired during this training program are valuable to me and will contribute to my professional development.

I express my gratitude to Mr. Ashok.kavde sir head of Adarsh lab and the whole training team for their support and guidance throughout the training.

Date: 23/3/2026

Place: Kolhapur.

Miss. Prachi Sanjay Mali

ACKNOWLEDGEMENT

At this juncture where the herculean task is nearing its pinnacle, science deems it a pleasure to look back and acknowledge efforts and support of all kith and kin that helped with zeal to turn a distant dream of an industrial training into reality.

We are extremely thankful to Dr. K. K. Bhise, Assistant Professor, PG Department of Microbiology, Vivekanand College, Kolhapur (An Empowered Autonomous Institute), project guide for her valuable guidance and mentorship throughout this project work given to us during the study.

We are indeed grateful to Head Dr. T. C. Gaupale, Coordinator Ms. V. V. Misal, PG Department of Microbiology, Vivekanand College, Kolhapur (An Empowered Autonomous Institute) for their kind co-operation and valuable support and we are also thankful to all the staff members of our department for their direct and indirect support.

We are thankful to Principal Dr. S. P. Thorat, for his kind co-operation and valuable support.

Also, we sincerely thank our parents for helping us in all aspects to complete the project work. Finally, we would like to appreciate our friends, colleagues for their direct and indirect contribution.

Date: 23/3/26

Place: Kolhapur

Miss. Prachi Sanjay Mali

Jr College Recog.No H.S.C./ 1074/R-1/DT : 8-8-1976
Jr College Code No. 23-09-002
Jr College U.Dise No 27341301006

"ज्ञान, विज्ञान आणि सुसंस्कार यांसाठी शिक्षण प्रसार"
-शिक्षणमहर्षी डॉ. बापूजी साळुंखे

ESTD June 1964
AISHE Code : C-11069
DTE Code 18125

Shri Swami Vivekanand Shikshan Sanstha's
VIVEKANAND COLLEGE, KOLHAPUR
(AN EMPOWERED AUTONOMOUS INSTITUTE)
2130, 'E' Tarabai Park, Kolhapur, Tal. Karveer, Dist. Kolhapur -416003
Affiliated to Shivaji University, Kolhapur (M.S.)
NAAC Reaccredited : "A+" (CGPA3.29)
College with Potential for Excellence by U.G.C., New Delhi
"Star College" by D.B.T Govt. of India
ISO 9001 : 2015

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Founder Dr. Bapuji Salunkhe D.Lit.
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Secretary Prin.Mrs. Shubhangi Gawade M.Sc.,B.Ed.
Inch. Principal Dr. S. P. Thorat M.Sc.,M.Phil.,Ph.D.

Ref. No. VCK/ 2109 /2025-26

Date : 13/12/2025

To,
The Managing Director,
Adharsha Clinical Lab,
Ichalkaranji.

Subject: - Regarding permission to carry out On Job training in your esteemed industry .

Respected Sir/Madam,

Our students of M.Sc. part I Microbiology are interested to carry out On Job training as a part of their curriculum during the period of **16th December to 31st December 2025**. So, kindly grant the permission and guide them for their training work. Name of the students attending training are as follows-

Sr. No.	Name of students	Roll No.
1.	Prachi .S. Mali	5413

Thanking you,

Yours faithfully

Dr. S. P. Thorat

I/c Principal
Vivekanand College, Kolhapur
(An Empowered Autonomous Institute)

Badave

आदर्श क्लिनिकल लॅबोरेटरी
८ २६६ श्रीकृपा मेडीकल जवळ
वेंकटनगर रोड इचलकरंजी ४१६ १११

Dr. MAHADEV MANE
MD (Patho)
Reg. No. 84881
Consultant Pathologist

ADARSH
CLINICAL LABORATORY

8/266, Arage Mala, Vikramnagar Road, Ichalkaranji- 416 115,
Dist. Kolhapur. Cell : 9767214461, 9420931068

INTERSHIP CERTIFICATE

This is to certify that Ms. Prachi Sanjay Mali, a student of M.Sc. part 1 Microbiology, Vivekanand College Kolhapur, has successfully completed an internship in the Microbiology Department at Adarsh clinical Laboratory from 16th December to 31s December 2025.

During the internship period, she was exposed to routle laboratory procedures, sample handling, staining techniques methods, and basic diagnostic practices. Her performance was found to be sincere, disciplined, and satisfactory throughout the training period.

We wish her all the best for his/her future academic and professional endeavors.

दर्श क्लिनिकल लॅबो
२६६ श्रीकृपा मेडीकल जवळ
कमनगर रोड इचलकरंजी ४१६ १११

Dr. MAHADEV MANE
MD (Patho)
Reg. No. 84881
Consultant Pathologist

Student Diary (Log) Recording Format

Week	Task Assigned	Activities Performed	Key Learnings	Additional Remarks
16/12/25 to 20/12/25	Basic laboratory Procedure	• observe Sample collection (blood, urine)	1) Importance of proper sample collection & labelling 2) Proper hygiene protocols	Active Participation
21/12/25 to 25/12/25	Hematology and Basic Clinical tests	• Observed Complete Blood Count (CBC) testing	Basics of haematology testing	Improved practical skills.
26/12/25 to 30/12/25	Biochemistry & urine analysis	observed Blood glucose and Cholesterol testing	Interpretation of urine test	Demonstrated good learning ability & attentation

Signature of Industry Supervisor

Attendance Sheet

Name & Address of Organization

Adarsh Clinical laboratory
8/266, Arage Mala, Vikramnagar
Road, Ichalkaranji - 416 115

Name of the Student	Prachi Sanjay Mali
Roll Number	5413
Name of Course	MSC. I (Microbiology)
Date of Commencement of Training	16/12/2025
Date of Completion of Training	30/12/2025

Month and Year:

Day	Date	Sign of student
1	16/12/25	
2	17/12/2025	
3	18/12/25	
4	19/12/2025	
5	20/12/2025	
6	21/12/2025	
7	22/12/25	
8	23/12/25	
9	24/12/25	
10	25/12/25	
11	26/12/25	
12	27/12/25	
13	28/12/25	
14	30/12/25	
15	31/12/2025	

- Attendance Sheet should remain affixed in Daily Training Diary. Do not remove or tear it off.
- Holidays should be marked in Red Ink in attendance column. Absent should be marked as A 'in Red Ink.

Name and Signature with date of Internship Supervisor _____

Supervisor Evaluation of Intern

Student Name: Prachi Sanjay Mali Date: 30/12/2025

Work Supervisor: Ashok Kavde Title: _____

Organization: Adarsh Clinical Laboratory

Internship Address: 8/266, Arage Mala, Vikramnagar road, ichalkaranji

Dates of Internship: From 16/12/2025 To 30/12/2025

Please evaluate intern by indicating the frequency with which you observed the following behaviors:

Parameters	Needs Improvement	Satisfactory	Good	Excellent
Behaviors				✓
Performs in a dependable manner				✓
Cooperates with co-workers and supervisors				✓
Shows interest in work				✓
Learns quickly				✓
Shows initiative				✓
Produces high quality work			✓	
Accepts responsibility		✓		
Accepts criticism		✓		
Demonstrates organizational skills			✓	
Uses technical knowledge and expertise			✓	
Shows good judgment			✓	
Demonstrates creativity/originality		✓		
Analyzes problems effectively		✓		

Is self-reliant				✓
Communicates well			✓	
Writes effectively				✓
Has a professional attitude			✓	
Gives a professional appearance			✓	
Is punctual				✓
Uses time effectively				✓

Overall performance of student intern (circle one):

(Needs improvement / Satisfactory / (Good) / Excellent)

Additional comments, if any:

Signature of Industry supervisor _____

HR Manager _____

Internship Undertaking

1. Student Name:	Prachi Sanjay Mali
2. Current Address	A/P, Shivanakswadi
3. Residence Address	–
4. Email id	Prachinumali258@gmail.com
5. Mobile Nos.	7350113341
6. Aadhar	538429837671
7. PAN	–
8. Overall GPA	-
9. Mode of Internship	offline
10. Internship Preferences	–

	Location	Core Area	Organization / Institute
Preference-1	Ichalkaranji		–
Preference-2	–	–	–
Preference-3	–	-	

I confirm that I agree with the terms, conditions, and requirements of the Internship Policy

Student Signature:

Date 23/3/2026

I confirm that the student has attended the internship orientation and has met all paperwork and process requirements to participate in the internship program, and has received approval from his/her mentor.

Sign of Department Faculty Coordinator

Date 23/3/2026

Student Feedback of Internship

(To be filled by Students after Internship completion)

Student Name: Prachi Sanjay Mali Date: 23/3/2026

Industrial Supervisor: Ashok Kavde sir Title: _____

Supervisor Email: – Internship is: – Paid – Unpaid ✓

Organization: _____

Internship Address: Vikram nagar, Ichalkaranji.

Faculty Coordinator: – Department: –

Dates of Internship: From 16/12/2025 To 30/12/2025

Give a brief description of your internship work (title and tasks for which you were responsible):

Was your internship experience related to your major area of study?

- Yes, to a large degree
- ✓ Yes, to a slight degree
- No, not related at all

Indicate the degree to which you agree or disagree with the following statements.

This experience has:	Strongly Agree	Agree	No opinion	Disagree	Strongly Disagree
Given me the opportunity to explore a career field	✓				
Allowed me to apply classroom theory to practice	✓				
Helped me develop my decision-making and problem-solving skills	✓				
Expanded my knowledge about the work world prior to permanent employment	✓				
Helped me develop my written and oral communication skills	✓				
Provided a chance to use leadership skills (influence others, develop ideas with others, stimulate decision-making and action)	✓				

Expanded my sensitivity to the ethical implications of the work involved		✓			
Made it possible for me to be more confident in new situations		✓			
Given me a chance to improve my interpersonal skills		✓			
Helped me learn to handle responsibility and use my time wisely		✓			
Helped me discover new aspects of myself that I didn't know existed before	✓				
Helped me develop new interests and abilities	✓				
Helped me clarify my career goals		✓			
Provided me with contacts which may lead to future employment	✓				
Allowed me to acquire information and/ or use equipment not available at my Institute	✓				

- In the Institute internship program, faculty members are expected to be meritors for students. Do you feel that your faculty coordinator served such a function? Why or why not?

  yes, the faculty Co-ordinator guided & supported me throughout internship

- How well were you able to accomplish the initial goals, tasks and new skills that were set down in your learning contract? In what ways were you able to take a new direction or expand beyond your contract? Why were some goals not accomplished adequately?

- In what areas did you most develop and improve?

  I improved my laboratory techniques.

- What has been the most significant accomplishment or satisfying moment of your internship?

  Sucessfully performing laboratory experiments independently.

- What did you dislike about the internship?

  Limited time to explore more advanced techniques.

- Considering your overall experience, how would you rate this internship? (Circle one).

  -Satisfactory/ Good/(Excellent)

- Give suggestions as to how your internship experience could have been improved. (Could you have handled added responsibility? Would you have liked more discussions with your professor concerning your internship? Was closer supervision needed? Was more of an orientation required?)

  More hands-on training & longer intership duration would improve experience

Signature of Student:

Name: Prachi Sanjay Mali

Roll number: 5413

Date: 23/3/2026

CONTENTS

ABOUT LABORATORY

Adarsh Laboratory is situated in Ichalkaranji. As compare to other this laboratory in full of all equipment. This laboratory provides all type of services at reasonable rate. The results of this laboratory Accurate Because it merges with metropolis the pathology specialist. All type of tests conducted in this laboratory. The stop of this Laboratory is punctual & highly qualified with great experience in their field, go this lab is very useful for the people.

This lab offers Various opportunities for students to think creatively, develop techniques & explore their interests. Therefore, Pathology lab is essential for students to learn & explain pathological facts & theories.

A medical laboratory or clinical laboratory is a laboratory where tests are conducted out on clinical specimens of patient to aid in diagnosis, treatment & prevention of disease.

INSTRUMENTS

1. centrifuge

Fig.1)centrifuge

Centrifugation play important role in both biological sectors. Medical laboratories use centrifuges to separate serum from blood cells. Centrifuge machines use centrifugal force to separate substances by density.

- USES :

1)The centrifuge used to seperate solids suspended in a liquid by. sedimentaticn.

2)The rotational movements allow forces much greater than gravity to generated in controlled periods of time.

3) In the laboratory, centrifuge, can used to seperate blood components: red cells,white cells, platelets to carry out further analysis tests & treatments.

2.**Freeze**

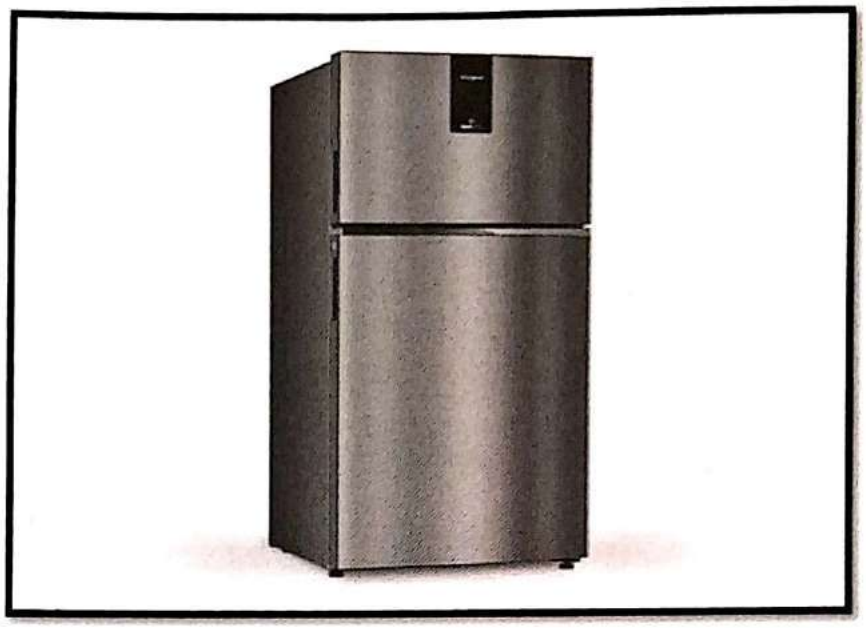


Fig.2)Freeze

Laboratory freezers are suitable for storing and maintaining the temperature of certain, materials like cool samples of specimens for Preservation.They include refrigeration units for storing blood Plasma & other Products, as well as Vaccines & other medical or pharmaceutical supplies.

A Freezer is a crucial component of a laboratory as it is often necessary for long-term storage of biological materials, like vaccines. bacteria samples, tissue samples & certain chemicals.

3.CBC machine

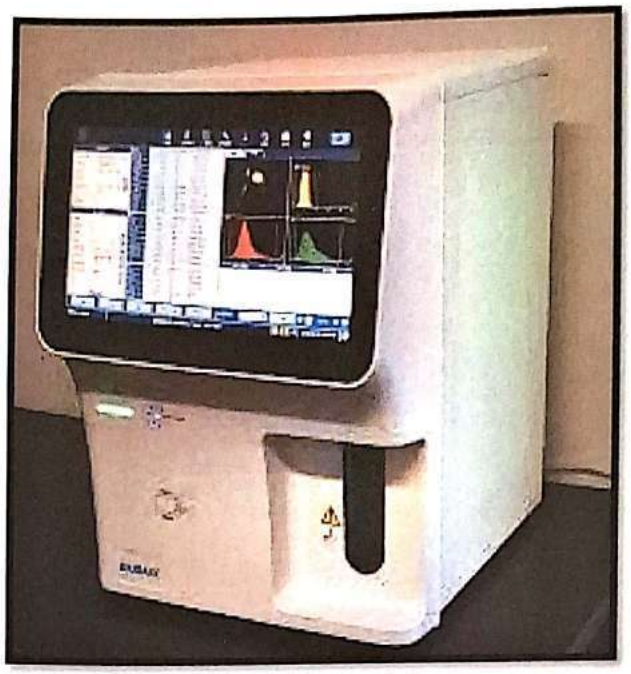


Fig.3)CBC machine

The CBC is usually performed by an automated hematology analyzer, which counts cells & collects information on their size and structure.The concentration of hemoglobin in measured, and the red blood cells indices are calculated from measurements of red blood cells and hemoglobin. CBC machine is an instrument designed to automate & and streamline the process of performing complete, Blood count tests. CBC machine utilize advanced technology to analyze blood samples and provide accurate quantitative and qualitative measurements of various blood components.A complete blood count, or CBC, is a group of blood tests that measure the number and size of the different cells in your blood.

4.Analyzer

Fig.4)Analyzer

A biochemistry analyzer is a medical laboratory instrument used to measure chemicals, enzymes, and analytes in bodily fluids like serum, plasma, and urine for diagnosing diseases

By automating processes like sample incubation and reagent mixing using photometry, these machines provide rapid, accurate results for liver, kidney, and metabolic functions, with options ranging from compact semi-automated units to high-throughput, fully automated systems

It is designed to conduct tests to measure chemicals at various stages of the biological processes on a wide range of test samples from blood, plasma, serum, and cerebrospinal fluid to urine.

5.Eletrolyte analyzer

Fig.5)Electrolyte analyzer

An electrolyte analyser is a specialized, often portable, diagnostic device that uses Ion-Selective Electrode (ISE) technology to rapidly measure the concentration of critical ions—sodium (Na+), potassium (k+), chloride (cl-), calcium (ca+), and pH—in blood, serum, or plasma

Essential for ICU and emergency care, these analyzers provide results in 30–60 seconds, supporting immediate, accurate diagnosis of dehydration, kidney function, and cardiac imbalances.

- **Technology:** Uses Ion-Selective Electrodes (ISE) for high precision and specificity.

6.Microscope

Fig.6)microscope

Microscopes magnify tiny objects for detailed study, essential in medicine (diagnosing diseases via blood/tissue), biology/research (observing cells, bacteria, viruses, DNA), forensics (analyzing hair, fibers, fingerprints), materials science (examining metal/crystal structures), education (teaching cell structure) .

Microscope is a laboratory instrument used to examine objects that are too small to be seen by the naked eye. Microscopy is the science of investigating small objects and structures using a microscope. Microscopic means being invisible to the eye unless aided by a microscope

HEMATOLOGY :

1)BLOOD GROUP :

The test to determine your blood group is called ABO typing. Your blood sample is mixed with antibodies against type A and B blood.

In at-home blood typing tests, they typically ask that you prick your finger with a lancet and put drops of your blood on a special card. After putting the blood on the card, you can observe the areas where blood clumps or spreads out, and then match those reactions to an included guide.

Group A has the A antigen and B antibody. Group B has the B antigen and the A antibody.

Group AB has A and B antigens but neither A nor B antibodies.

Group 0 doesn't have A or B antigens but has both A and B antibodies. Rh-null or golden blood. It is the world's rarest blood type, with fewer than 50 known cases ever reported.

AB- AB- is the rarest of the eight basic blood types, accounting for less than one percent of the world's population. HH blood type, rare ABO group, or Bombay blood group.

If your blood is A positive (A+), it means that your blood contains type-A antigens with the presence of a protein called the rhesus (Rh) factor. Antigens are markers on the surface of a blood cell. According to the American Red Cross, this is one of the most **COITIITIOn** blood types.

O positive is the most **COmITIOn** blood type as around 35% of our blood donors. have it The second most **COITIITIOn** blood type is A positive (300/0), while AB negative D(1%) is the rarest.

Materials

1.Toothpicks

2.Blood sample

3.Alcohol Swabs
4.lancet
5.clean glass slide
6.sterile cotton balls
7.monoclonal antibodies (Anti -A,Band D)

Procedure :

- Take a clean glass slide and draw three circles on it.
- Unpack the Monoclonal Antibodies (MAB) kit. In the first circle add Anti-A, to the second circle add Anti-B and to the third circle add Anti-D with the help of a dropper
- Keep the slide aside safely without disturbing.
- Now wipe the ring finger with the alcohol swabs and rub gently near the fingertip, where the blood sample will be collected
- Prick the ring fingertip with the lancet and wipe off the first drop of the blood. As blood starts oozing out, allow it to fall on the three circles of the glass slide by gently pressing the fingertip.
- Apply pressure on the site where it was pricked and to stop blood flow. Use the cotton ball ifrequired.
- Mix the blood sample gently with the help of a toothpick and wait for a minute to observe the result.

2)TYPHOID TEST:

A diagnosis of typhoid fever can usually be confirmed by analysing samples of blood, poo, or pee. These will be examined under a microscope for the Salmonella typhi bacteria that cause the condition .

A complete blood count (CBC) will show a high number of white blood cells. A blood culture during the first week of the fever can show S typhi bacteria. Other tests that can help diagnose this condition include: ELISA blood test to look for antibodies to the S.typhi bacteria.

How do you read a Typhoid test? If IgG and IgM are present in the typhoid test, it indicates acute typhoid fever. If IgM only is present, it means you have acute typhoid fever. If there is only IgG and IgM is negative, it refers to a past Sahnonella infection. For a proper diagnosis, titres ranging from 1:20,1:40, 1:60, 1:80,1: 160, and 1 :200 need to be included in the diagnosis to obtain the typhoid test report. Negative Result - A negative, Only considered a normal range for a Widal test result is when the value of 0 and H antigens are less than 1: 160.

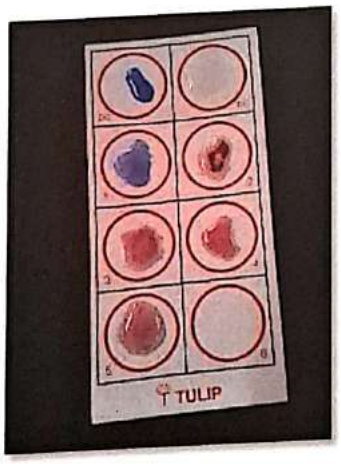


fig.widal test

3) Blood sugar (F, PP) blood test :

Blood Sugar (F, PP) blood test is performed in two two stages: F (fasting) and PP (post-prandial) (Post Prandial). The blood test F (fasting) provides important information about the body's ability to regulate blood sugar levels. The PP test is used to detect the quantity of glucose present in the blood after eating.

Glucose fasting (F) and Post Meal (PP) Test (Fasting and Post Prandial Blood Sugar Test) It is a simple blood test that is used to detect fasting blood sugar (FBS) levels and post prandial blood sugar (PPBS) levels. Here the sugar which is measured in blood is glucose. Test results vary by age and are usually measured in milligrams per deciliter (mg/dl.). Normal results for the 2-hour postprandial test based on age are: For those who don't have diabetes: less than 140 mg/dL. For those who have diabetes: less than 1 80 mg/dL. Blood sugars by age

fig.Blood sugar

4)DENGUE TEST :

CBC test for dengue: Dengue fever is manifested by a decrease in White Blood Cells (WBC) < 5000 cells/mm3 count (leukopenia), platelet count (thrombocytopenia)< 150,000 cells/mm3 and an increase in haematocrit value (5-100/0) with no evidence of plasma leakage.

A positive NS 1 test result confirms dengue virus infection without providing serotype information. A negative NSI test result does not rule out infection. People with negative NS 1 results should be tested for the presence of dengue IgM antibodies to determine possible recent dengue exposure.

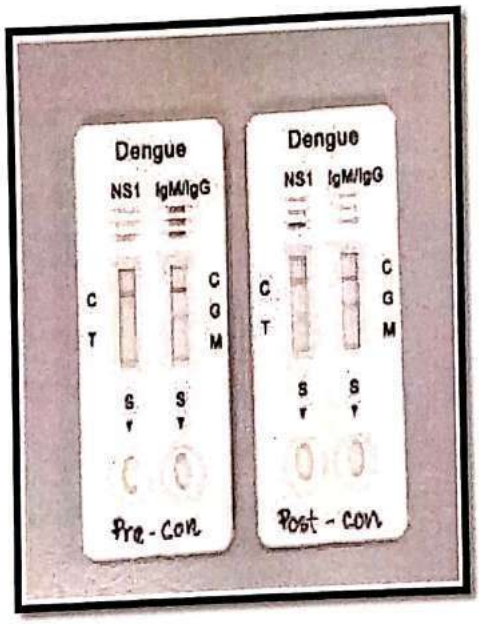


Fig.Dengue test kit

5) HbAlc TEST:

HbA 1 c is a blood test that is used to diagnose type 2 diabetes. It is also used to monitor blood glucose control in people with diabetes. HbA 1 c is short for glycated haemoglobin. The test is also sometimes called haemoglobin Al c. Haemoglobin (Hb)is the protein in n in red blood cells that carries oxygen through your body.

Four basic types of methods are used most commonly to measure HbAlc: immunoassay, ion-exchange high-performance liquid chromatography (HPLC), boronate affinity HPLC, and enzymatic assays.

A fasting period of at least 8 hours is required for the FPG test, whereas no preparation is needed for the HbA 1 c test. HbA 1 c measures your blood sugar levels over the past 2 to 3 months, while FPG measures your immediate blood glucose levels.

For people without diabetes, the normal range for the hemoglobin Alc level is between 40/0 and 5.6%. Hemoglobin Alc levels in the range of 5.7%-6.4% mean you have prediabetes and a higher chance of getting diabetes. Levels of6.5% or higher mean you have diabetes.

CLINICAL PATHOLOGY

Procedure urine examination:

Routine (complete) Examination of Urine is divided in three parts

A. Physical/Gross Examination.
B. Chemical Examination
C. Microscopic Examination.

A.PHYSICAL EXAMINATION OF URINE DETERMINATION:

DETERMINATION	NORMAL FINDINGS	ABNORMAL	PATHOLOGIC
1. Volume of urine	50-200 ml	>500 ml	Diebetesus, Polyuria
		<20 ml	Oliguria Anuria
2. Colour of urine	Pale yellow	Dark yellow	Hepatic and post hepatic condition
	White	Redish	Chyluria, Hematuria
		Black urine	Alkaptonuria
		Dark yellow	Biliverdin present
3.Appearance of urine	Usually clear	Turbid	Presence abnormal Leukocytes
		Milky	Chyle
4.Reaction	Usually acidic pH 4.88-7.5	pH less than 4.8 more acidic urine	Fever, Ketosis
	pH more than 7.5 Alkaline urine		Severe vomiting
5. Odour of urine	Aromatic	Fruity	Acidosis, Ketosis
		Ammoniacal	Cystitis
		Foul smelling	Infection urinary

6. Specific gravity of urine	Varies from 1.003-1.060	Low sp. Gravity	Chronic nephritis and diabetes insipidus
		High sp. Gravity	Diabetes insipdus fever, Acute nephritis

Normal ranges of physical examination:

TEST	ABBREVIATION	UNITS	NORMAL RANGES
Glucose	GLU	mg/dl	NEGATIVE
Bilirubin	BIL		NEGATIVE
Ketone	KET	Mg/dl	NEGATIVE
Specific gravity	SG		1.016-1.022
pH	pH		5.0-8.0
Protein	PRO	Mg/dl	NEGATIVE
Urobilinogen	URO	E.U./dl	0.2-1.0
Nitrate	NIT		NEGATIVE
Blood	BLO		NEGATIVE
Leukocytes	LEU		NEGATIVE

B. CHEMICAL EXAMINATION:

1. Glucose
2. Proteins

SUGAR (GLUCOSE) TEST ("BENEDICT'S QUALITATIVE TEST"]:

Principle:

Urine glucose reduces cupric ions present in the reagent to cupric ion, Alkaline medium is provided to the reaction by sodium carbonate present in the reagent the original colour change blue to green, yellow, orange and red A/C to concentration glucose

Procedure of glucose:

1) Take 5ml of Benedict's reagent in the test tube.

2) Add 8 drops of urine

3) Boil for 2 minute and allow cooling under tap water.

Observation & Result:

Blue clear - NEGATIVE

Green, no ppt. – TRACE

Green with ppt. - +

Brown with cloudy. - ++

Orange with cloudy. - +++

Red with cloudy. - ++++

Disease- Hyperglycemia, Renal glycosuria

Albumin Protein:

Principle:

Sulphosalicyclic acid solution (35%) precipitates any protein is the urine specimen irrespective of the type albumin or Bence jones. It is an anion precipitant that works by the neutralization of the protein cation.

Pathogenic: Nephritic syndrome.

Microscopic examination of urine:

In microscopic, I examined the various cells likes Pus cells, RBCs, Epithelial cells, Triple phosphate Calcium oxalate. Cholesterol and Uric acid

INTRODUCTION:

Clinical Biochemistry deals with the biochemistry laboratory applications. To find out Cause of disease The chemical constituent of various body fluid such as Blood, Urine, CSF and other body fluid like are analyzed in clinical biochemistry laboratory. The Biochemistry test are very useful to determine the severity of disease of many organ. The Clinical biochemistry tests in relation to the various clinical conditions.

1. The cause of disease
2. Screen assay diagnosis.
3. Suggested effective treatment.
4. Monitoring process of a pathological condition
5. Help in assessing response to therapy

BIOCHEMISTRY

NAME OF THE TEST:

1.Glucose:

- Fasting blood sugar
- Random blood sugar
- Postprandial blood sugar

2. Renal function test (RFT)

3. Liver Function Test (LFT)

- Bilirubin Direct and Total
- SGPT
- SGOT
- ALP

5. **Lipid Profile:**

- Cholesterol
- Triglyceride

1.GLUCOSE

Principle:

UV test enzymatic reference method with hexokinase. Hexokinase catalyzes the phosphorylation of glucose to glucose-6-phosphate by ATP. Glucose+ ATP Hexokinases G-6-P+ ADP Glucose-6-phosphate dehydrogenase oxidizes glucose-6-phosphate in the presence of NADP to gluconate-6phosphate. The rate of NADPH formation during the reaction is directly proportional to the glucose concentration and is measured photo metrically.

Procedure:

Separate the serum or plasma sample from the test tube with the help of micro pipette. Take the sample in a cuvette. Give the command to the analyzer and select the tests. Press ok. Then place the cuvette in the analyzer. Analyzer gives result automatically.

Normal range of Glucose

Fasting	Postprandial	Random
70-110 mg/dl	80-140 mg/dl	100-150 mg/dl50

Case study

Name : Mr.sarita bajaj

Age/sex: 70/female

Sample: Fasting plasma

Result obtained: 156 mg/dl

Interpretation: The blood glucose level in the patient is high which indicates hyperglycemia.

Clinical significance

Hyperglycemia	Hypoglycemia
Diabetes mellitus	Overdose of insulin
Hyperactivity of thyroid, adrenal, pituitary gland	Hypoactivity of thyroid, adrenal, pituitary gland

2.RENAL FUNCTION TEST (RFT)

Blood urea nitrogen (BUN):

Principle:

Kinetic test with urease and glutamate dehydrogenase: Urea is hydrolyzed by urease to form ammonium and carbonate.

Urea-2 H_2O. UREASE 2 NH4+CO,2-

In the second reaction 2-oxoglutarate reacts with ammonium in the presence of glutamate dehydrogenase (GLDH) and the coenzyme NADH to produce L-glutamate. In this reaction two moles of NADH are oxidized to NAD for each mole of urea hydrolyzed.

NH4+2-oxoglutarate NADH GLDH L-glutamate + NAD+H_2O

The rate of decrease in the NADH concentration is directly proportional to the urea concentration in the specimen and is measured photo metrically.

Normal range: 7-10 mg/dl

3.LIVER FUNCTION TEST (LFT) Introduction:

Liver function tests (LFTs) are commonly used in clinical practice to screen for liver disease, monitor the progression of known disease, and monitor the effects of potentially hepatotoxic drugs. The most common LFTs include the serum aminotransferases, alkaline phosphatase, bilirubin, albumin, and prothrombin time. Aminotransferases, such as alanine aminotransferase (ALT) and aspartate aminotransferase (AST), measure the concentration of intracellular hepatic enzymes that leaked into the circulation and serve as a marker of hepatocyte injury.

1) TOTAL BILIRUBIN Principle:

Diazotized Sulfani acid is formed by combining sodium nitrite and sulfanilic acid at low ph The sample is diluted in 0.05m Hydrochloric acid. A blank reading is taken to eliminate interference from non- bilirubin pigments. Upon addition of the diazotized sulfanilic acid, the conjugate bilirubin is converted to diazo-bilirubin, a red chromosphere which absorbs at 540nm.

Normal range: 0.20-1.00mg/dl

2) SGPT (Serum glutamate Pyruvate Transaminase)

(Also called ALT (Alanine Transaminase)

Principle:

Alanine aminotransferase catalyzes the transamination of L-alanine to aketoglutarate, forming L-glutamate and pyruvate. The pyruvate formed is reduced to lactate by lactate dehydrogenase (LDH) with simultaneous oxidation of reduced nicotinamide-adenine dinucleotide (NADH). The change in absorbance is directly proportional to the ALT activity and is measured using a dichromatic (340, 700 nm) rate technique

L-Alanine + a-ketoglutarate ALT pyruvate + L-glutamate

Pyruvate + NADH+H+ LDH L-lactate + NAD+

Normal range: 30-65 U/L

3) SGOT (Serum Glutamate Oxaloacetate Transaminase) Also called AST (Aspartate Transaminase)

Principle:

Aspartate aminotransferase catalyzes the transamination of L-aspartate to a-Ketoglutarate, forming L-glutamate and oxaloacetate. The oxaloacetate formed is reduced to malate by malate dehydrogenase (MDH) with simultaneous oxidation of reduced nicotinamide adenine dinucleotide (NADH), The change in absorbance with time due to the conversion of NADH to NAD is directly proportional to the AST activity and is measured using a dichromatic (340, 700 nm) rate technique.

L-Aspartate +a-ketoglutarate AST →oxaloacetate L-glutamate

Oxaloacetate + NADH + H+ MDH→L-malate + NAD+

Normal range: 15-37 U/L

4.LIPID PROFILE

1) CHOLESTEROL

Principle:

Cholesterol esters are hydrolyzed by cholesterol ester hydrolase to produce free cholesterol and fatty acids. The free cholesterol produced and preexisting one is oxidized by cholesterol oxidase to cholestenone-4-en-3-one and hydrogen peroxide. Hydrogen peroxide thus formed is used to oxidize N, N diethylaniline-4-aminoantipyrine to produce a chromosphere that absorbs at 540 nm. The absorbance due to oxidized N, N diethyl aniline- 4aminoantipyrine is directly proportional to the total cholesterol concentration and is measured using a polychromatic (452, 540,700 nm) end point technique.

Normal range: 0-200mg/dl

2) TRIGLYCERIDES

Principle:

•Triglycerides + water ---(Lipoprotein Lipase)---> Glycerol + fatty acids

•Glycerol + ATP ---(Glycerol kinase)---> Glycerol-3-phosphate + ADP

•Glycerol-3-phosphate + oxygen ---(Glycerol phosphate oxidase)---> Dihydroxy acetone Phosphate + Hydrogen peroxide

•Hydrogen peroxide + Aminoantipyrine ---(Peroxidase)---> Quinoneimine +HCL +4-Chlorophenol +4H20

The change in absorbance due to the formation of Quinonimine is directly proportional to the total amount of glycerol and its precursors in the sample and is measured using a dichromatic (510, 700 nm) endpoint technique.

Normal range: 15-1000mg/dl.

Clinical significance:

TG level decreases in:

- Liver disease
- Cerebral infarction,
- Hyper parathyroidism

LABORATORY SAFETY AND WASTE MANGEMENT

LABORATORY HAZARDS AND ACCIDENTS

The main hazard and accidents associated with medical laboratory work are as follows:

Harmful effects of toxic chemicals

Injury from explosions

Electric shock

Buns.cuts

Infection:-

Infection can be caused by:

Pathogens being inhaled in aerosols (airborne droplets) when snap closing specimen contain, dispensing or pipetting infectious fluids, or centrifuging infectious material in open buckets. Aerosols may also be formed and inhaled following breakages or after spilling infectious fluids. Breakages in centrifuges can be particularly hazardous if the centrifuge is opened before the aerosols have settled .

Pathogens being ingested from contaminated fingers, or in food that has been contaminated, eg by being stored in a laboratory refrigerator. Care should be taken to avoid the fingers or other parts of the body touching infected materi

Mouth-pipetting specimens and cultures is one e of of the COmITIOnest ways of ingesting pathogens. Pathogens entering the skin through needle punctures, cuts, scratches, insect bites, sores or other open skin lesions. Laboratory workers must always handle infected needles with great care.

Note: Laboratory-acquired infections are more fully dis cussed in Chapter 33 in Volume II of the Manual.

Burns:-

Burns urns may be caused by: Flammable chemicals and stains, or by rea- gents catching alight Fires from spirit lamps, Bunsen burners, Need tapers (eg. when heating Ziehl ment o it or save), or from faulty electrical equip overloaded Spirit burners should not be used in direct sunlight because in bright light the flame can be difficult to see. Corrosive chermicals being spilt on the skin or ingested when mouth-pipetting.

1)Harmful effects of toxic chemicals

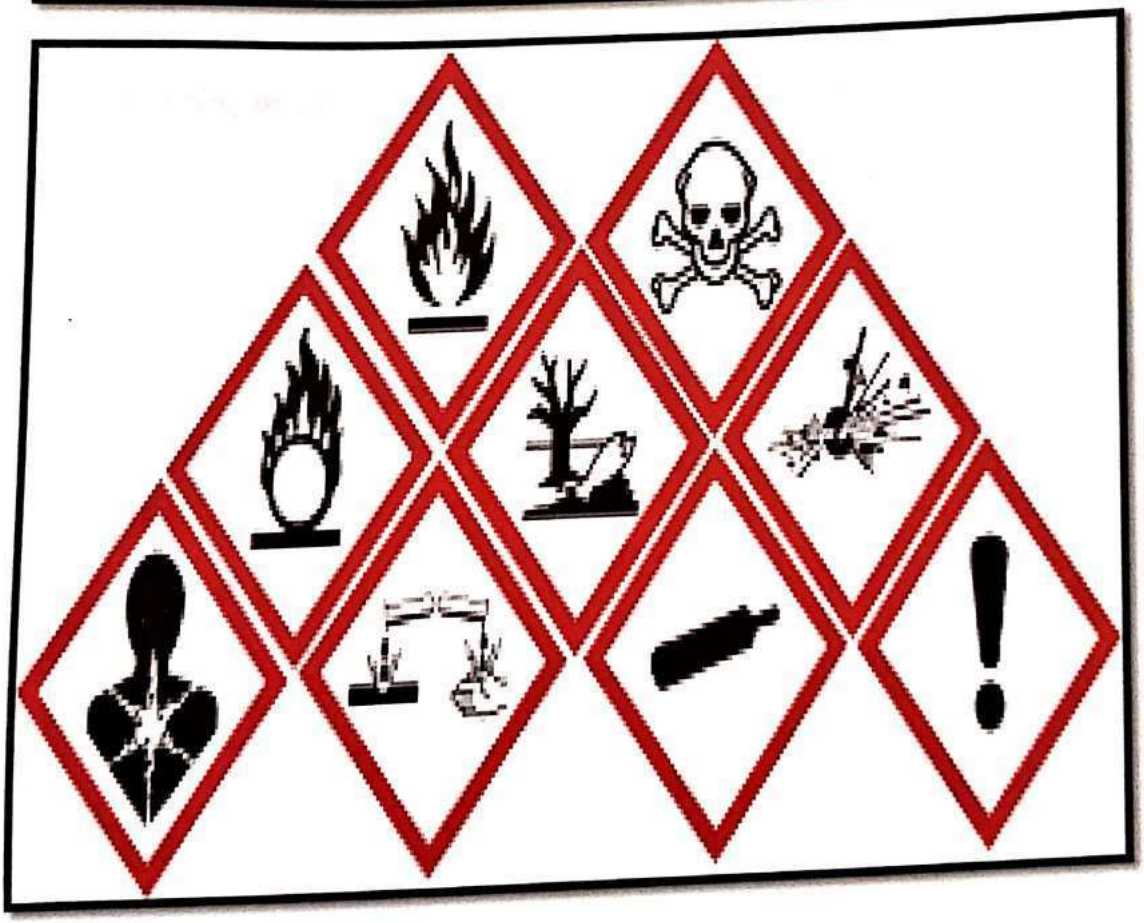
Inhaling fumes from rom toxic chemicals, Ingesting toxic chemicals by 1110uth pipetting, Skin contact with toxic chemicals.

2)Injury from explosions

Injury from explosions can be caused by: Incompatible chemicals exploding, Leaking gas exploding.

3)Electric shock

Electric shock can be caused by: Faulty electrical circuits, Incorrect installation of Touching exposed live wires.



CONCLUSION

My internship at Adarsh clinical laboratory has been an invaluable learning experience that has not only enhanced my knowledge of transfusion medicine but also deepened my appreciation for the critical role that diagnostic center's play in saving lives. Throughout my internship, I had the opportunity to work closely with a team of dedicated professionals who are passionate. I gained hands-on experience in various aspects of diagnostic center, including blood collection, testing, and interpretation of results.

One of the most significant takeaways from my internship was the importance of attention to detail and adherence to strict protocols to ensure the safety. I also learned about the latest advancements in transfusion medicine and the challenges faced by diagnostic labs This internship has not only prepared me for a career in transfusion medicine but also instilled in me a sense of social responsibility and a commitment to making a positive impact in my community.

I am grateful for the opportunity to have worked at Adarsh lab and I look forward to applying the knowledge and skills I gained during my internship to make a difference in the lives of others