

A
On Job Training Report
On
PATHOLOGY LABORATORY
Completed at

Galaxy hospital pathology lab
Address- Nivruti colony, Warananagar,
dist.Kolhapur -416114

By

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2025-26

Dissemination of Education for Knowledge, Science and Culture
- Shikshanmaharshi Dr. Bapuji Salunkhe



Shri Swami Vivekanand Shikshan Sanstha's
VIVEKANAND COLLEGE, KOLHAPUR
(AN EMPOWERED AUTONOMOUS INSTITUTE)
PG Department of Microbiology



CERTIFICATE

OF

ON JOB TRAINING

This is to certify that Anuradha Suresh Khavare 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: 23/03/26

Dangade
25.03.26
Examiner

Smali
OJT In charge

Gangale
Head

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



Shri Swami Vivekanand Shikshan Sanstha's
VIVEKANAND COLLEGE, KOLHAPUR

(AN EMPOWERED AUTONOMOUS INSTITUTE)

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Inch. Principal
Dr. S. P. Thorat
M.Sc., M.Phil., Ph.D.

Ref. No. VCK/ 2127/2025-26

Date: 17/12/2025

To,
The Managing Director,
Galaxy Hospital (Lab)
Warnanagar,
Kolhapur.

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

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. The names of students attending training are as follow:

Sr. No.	Names of students	Roll No.
1.	Anuradha S Khavare	5411
2.	Janhvi J Jadhav	5405
3.	Sanika S Jadhav	5406
4.	Prajakta K Patil	5416
5.	Prithviraj S Shewale	5420
6.	Pratik S Kadam	5409

Thanking you,



Yours faithfully

S.P. Thorat
Dr. S.P. Thorat

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

Internship Undertaking

1. Student Name:	Anuradha Suresh Khavare
2. Current Address	-
3. Residence Address	At post - Mohare, Tal - Panhala, Dist - Kolhapur
4. Email id	anuradhakhavare@gmail.com
5. Mobile Nos.	9028743693
6. Aadhar	6941 5382 5895
7. PAN	QJNPK2527Q
8. Overall GPA	-
9. Mode of Internship	offline
10. Internship Preferences	-

	Location	Core Area	Organization / Institute
Preference-1	Warananagar	Wardha	Galaxy Hospital
Preference-2	-	-	-
Preference-3	-	-	-

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

Student Signature: Akhavare

Date 23/03/26

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.

Smali

Sign of Department Faculty Coordinator

Date

Student Diary (Log) Recording Format

Week	Task Assigned	Activities Performed	Key Learnings	Additional Remarks
16/12/25 to 20/12/25	Sample collection and labeling, centrifugation of blood sample, CBC test using automated cell counter.	1) Balance tubes and operated centrifuge to separate serum. 2) Loaded blood sample into CBC machine and recorded result	1) Importance of correct labeling and aseptic techniques to avoid errors. 2) Parameters like RBC, WBC, Hb platelets and their clinical importance	1) Observed clear separation of layers 2) Observed clear separation of layers 3) Machine calibration is important.
21/12/25 to 25/12/25	Biochemistry test	Performed glucose test using biochemistry analyzer	Principle of biochemical test.	Proper reagent handling required
26/12/25 to 25/12/25	Urine strip test, dipstick test, smidaxid test.	1) Dipped strip in urine sample and compared color with chart. 2) Antigen-Antibody reaction & interpretation of agglutination. 3) Identified prepared blood smear	1) Detection of glucose, protein, pH, ketones in urin. 2) Ag-Ab reaction and interpretation of agglutination. 3) Identification of malarial parasite & importance of staining	1) Quick and useful screening test. 2) Results must be confirmed with further tests. 3) Thick and thin smears have different uses.

Amal

Signature of Industry Supervisor

Attendance Sheet

Name & Address of Organization

Galaxy hospital pathology lab
Address - Nivrtti colony, Warananagar
dis - Kolhapur - 416114

Name of the Student	Anuradha suresh khavare
Roll Number	5411
Name of Course	M.SCI 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 / 2025	Akhavare
2	17 / 12 / 2025	Akhavare
3	18 / 12 / 2025	Akhavare
4	19 / 12 / 2025	Akhavare
5	20 / 12 / 2025	Akhavare
6	21 / 12 / 2025	Akhavare
7	22 / 12 / 2025	Akhavare
8	23 / 12 / 2025	Akhavare
9	24 / 12 / 2025	Akhavare
10	25 / 12 / 2025	Akhavare
11	26 / 12 / 2025	Akhavare
12	27 / 12 / 2025	Akhavare
13	28 / 12 / 2025	Akhavare
14	29 / 12 / 2025	Akhavare
15	30 / 12 / 2025	Akhavare

- 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 Vaishnavi m. Patil
mpatil

Supervisor Evaluation of Intern

Student Name: Miss. Anuradha S. Khavare Date: 31-12-25

Work Supervisor: Naishnavi M. Patil Title: _____

Organization: Galaxy Hospital Warananagar Pathology Lab

Internship Address: Nivrutti Colony, Warananagar

Dates of Internship: From 16th Dec. 2025 To 31st Dec. 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):

Excellent.

(Needs improvement / Satisfactory / Good / Excellent)

Additional comments, if any:

Signature of Industry supervisor *[Signature]*

HR Manager _____



Student Feedback of Internship

(To be filled by Students after Internship completion)

Student Name: Anuradha Suresh Khavare Date: 05/01/26
 Industrial Supervisor: Vaishnavi Patil Title: _____
 Supervisor Email: _____ Internship is: - Paid - Unpaid -
 Organization: _____
 Internship Address: Nirvrtti Colony, Warananagar
 Faculty Coordinator: _____ Department: _____
 Dates of Internship: From 16/12/2025 To 31/12/2025

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	yes				
Allowed me to apply classroom theory to practice	yes				
Helped me develop my decision-making and problem-solving skills	yes				
Expanded my knowledge about the work world prior to permanent employment	yes				
Helped me develop my written and oral communication skills	yes				
Provided a chance to use leadership skills (influence others, develop ideas with others, stimulate decision-making and action)	yes				

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

- In the Institute internship program, faculty members are expected to be mentors for students. Do you feel that your faculty coordinator served such a function? Why or why not?
 Yes, the faculty coordinator guided and supported me throughout the 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?
 I was able to achieve most of the goals and learned several new practical skills.

- In what areas did you most develop and improve?
I improved my laboratory techniques, communication, and practical knowledge.
- What has been the most significant accomplishment or satisfying moment of your internship?
Successfully 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 and longer internship duration would improve the experience.

Signature of Student: Akhavare

Name: Akhaddha Suresh Khavare

Roll number: 5411.

Date:

DECLARATION

I hereby declare that I have successfully completed the On Job Training program at Galaxy hospital pathology lab. 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 miss. Vaishanvi Patil, Galaxy hospital pathology lab and the whole training team for their support and guidance throughout the training.

Date: 05/01/2026

Place: Kolhapur

Anuradha Suresh Khavare

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. S. D. Mali/ 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: 05/01/2026

Place: Kolhapur

Anuradha Suresh Khavare

CERTIFICATE

This is certify that Miss. Anuradha Suresh Khavare from Vivekanand College, Kolhapur (An Empowered Autonomous Institute) has successfully completed On Job Training (OJT) at Galaxy Hospital Pathology Lab from 16th December 2025 to 31th December 2025.

During this period, the Student observed and assisted in basic pathological procedures and daily laboratory activities. Her performance during training was satisfactory.

She is found to be hardworking, sincere and good character We wish her all the best for future.

Date : 31/12/2025.



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ABOUT LABORATORY

A pathology laboratory plays a vital role in the diagnosis, treatment, and monitoring of diseases. It provides accurate laboratory investigations that help clinicians in understanding the pathological condition of patients. Among various sections of a pathology laboratory, the hematology and biochemistry sections are of great importance. Automated cell counters and biochemistry analyzers have improved the speed, accuracy, and reliability of laboratory investigations. This project focuses on the study of a pathology laboratory with special emphasis on the cell counter and biochemistry section.

Instrument of pathology lab

1) Centrifuge



Introduction

A centrifuge is a laboratory instrument used to separate components of a mixture based on density by spinning at high speed.

Principle

- Works on the principle of centrifugal force.
- When rotated at high speed, heavier particles move outward and settle at the bottom, while lighter components remain at the top.

Working

- Sample is placed in tubes
- Tubes are balanced and placed in rotor
- Machine is run at a specific speed
- Separation occurs into layers (e.g., serum and cells)

Uses

- Separation of serum/plasma from blood
- Urine sediment analysis
- Preparation of samples for biochemical tests.

Advantages

- Fast and efficient separation
- Easy to operate
- Saves time in laboratory procedures

2) Refrigerator



Introduction

A laboratory refrigerator is used to store samples, reagents, and chemicals at low temperature to prevent degradation.

Principle

- Works on cooling and temperature regulation
- Maintains temperature usually between 2°C to 8°C.

Uses

- Storage of blood samples
- Preservation of reagents and kits
- Storage of vaccines and chemicals

Importance

- Prevents microbial growth
- Maintains stability of samples
- Ensures accuracy of test results

Test Performed

1. Cell Counter

An automated cell counter is an essential instrument in the hematology section of a pathology laboratory. It is used for the analysis of blood cells and provides rapid and precise results.

Principle

Most automated cell counters work on the principle of electrical impedance or flow cytometry. Cells passing through an aperture cause changes in electrical resistance, which are counted and sized.

Parameters Estimated

- Hemoglobin (Hb)
- Total Red Blood Cell (RBC) count
- Total White Blood Cell (WBC) count
- Platelet count
- Hematocrit (PCV)
- Mean Corpuscular Volume (MCV)
- Mean Corpuscular Hemoglobin (MCH)



Fig. CBC Machine

Working

- Blood sample is aspirated into the machine
- Cells are counted and analyzed
- Results are displayed on screen or printed

Uses

- Diagnosis of anemia
- Detection of infections
- Identification of blood disorders (e.g., leukemia)

Advantages

- Rapid processing of samples
- High accuracy and precision
- Reduced manual errors
- Requires small volume of blood

Clinical Importance

Cell counters help in the diagnosis of anemia, infections, leukemia, and other hematological disorders.

2. Biochemistry Section

The biochemistry section of a pathology laboratory deals with the estimation of various biochemical constituents present in blood, serum, and other body fluids.

Principle

Biochemical tests are based on chemical reactions that produce color changes, enzymatic reactions, or changes in absorbance, which are measured using semi-automated or fully automated biochemistry analyzers.

Common Biochemical Tests

- Blood glucose
- Serum urea
- Serum creatinine
- Liver function tests (SGOT, SGPT, ALP, bilirubin)
- Lipid profile
- Serum proteins
- Cholesterol
- Calcium



Fig. Biochemistry Machine

Working

- Sample and reagent are mixed
- Chemical reaction occurs
- Color change is measured
- Concentration is calculated automatically

Uses

- Diagnosis of diabetes
- Kidney function assessment
- Liver function evaluation
- Lipid profile analysis

Advantages

- Accurate and reliable
- Handles large number of samples
- Reduces human error

Clinical Importance

Biochemical investigations help in the diagnosis and monitoring of diabetes mellitus, kidney disorders, liver diseases, cardiovascular disorders, and metabolic abnormalities.

3. WIDAL TEST

Introduction

The Widal test is a serological test used for the diagnosis of enteric fever (typhoid fever) caused by *Salmonella typhi* and *Salmonella paratyphi*.

It detects antibodies present in the patient's serum against specific antigens of the bacteria.

Principle

When serum containing antibodies is mixed with corresponding antigens, visible agglutination (clumping) occurs.

The degree of agglutination indicates the presence and level of antibodies.

Antigens Used

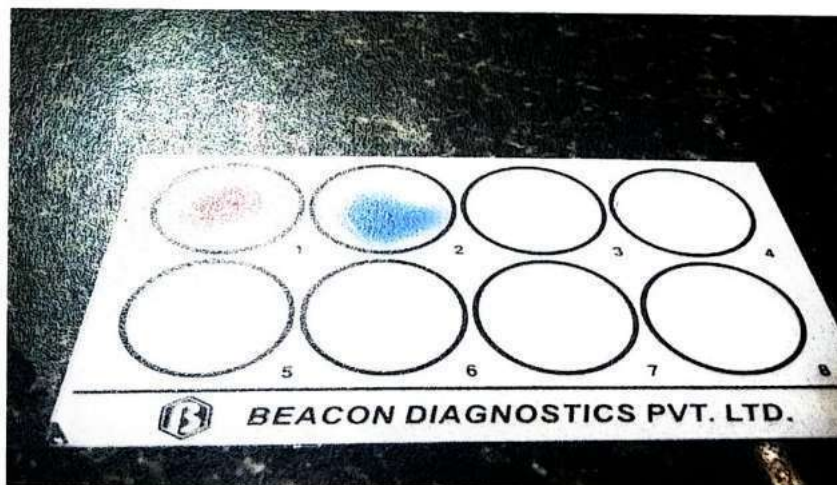
- O antigen – Somatic antigen (indicates active infection)
- H antigen – Flagellar antigen
- AH antigen – *Salmonella paratyphi* A
- BH antigen – *Salmonella paratyphi* B

Types of Widal Test

- 1) Slide Agglutination Test
- 2) Rapid screening test
- 3) Gives qualitative results
- 4) Tube Agglutination Test
- 5) Gives quantitative antibody titers

Procedure (Slide Test)

- Patient serum is placed on a slide
- Specific antigens are added
- Slide is gently rocked
- Agglutination is observed visually





Interpretation

- Significant titer indicates enteric fever
- Rising titer in paired samples confirms infection

Clinical Significance

- Helps in diagnosis of typhoid fever
- Useful in areas with limited laboratory facilities

Limitations

- False positive and false negative results
- Not reliable in early stages of infection
- Previous vaccination or infection may affect results

4. MALARIA TEST

Introduction

Malaria is a parasitic disease caused by *Plasmodium* species and transmitted by the female Anopheles mosquito.

Laboratory diagnosis is essential for early detection and treatment.

Types of Malaria Tests

1. Peripheral Blood Smear Examination

This is the gold standard test for malaria diagnosis.

Types of Smears

Thick blood smear

- Used for detection of parasites
- More sensitive

Thin blood smear

- Used for species identification

Principle

- Parasites present in blood are stained and visualized under a microscope.
- Giemsa stain is commonly used.

Procedure

Blood sample is collected

Smear is prepared on glass slide

Smear is stained with Giemsa stain

Examined under oil immersion microscope

Advantages

Confirms malaria infection

Identifies *Plasmodium* species

Estimates parasite load

2. Rapid Diagnostic Test (RDT)

Principle

- Detects malarial antigens using immunochromatographic method
- Gives quick results



Advantages

- Rapid and easy
- No microscope required
- Limitations
- Cannot quantify parasite load
- Less sensitive than smear

5.URINE TEST

Introduction

The urine strip test (also called urine dipstick test) is a rapid screening test used in pathology laboratories to analyze different chemical components present in urine.

It helps in the early detection of kidney disorders, urinary tract infections, diabetes, and metabolic diseases.

The test uses a plastic strip with small reagent pads that change color when dipped in urine.

Principle

The urine strip test is based on chemical reactions between reagents on the strip and substances present in urine.

Each pad contains specific chemicals that react with urine components and produce a color change.

The color is compared with a standard color chart to determine the result.

Materials Required

Urine test strip (dipstick)

Fresh urine sample

Clean urine container

Tissue paper

Color chart (provided with strips)

Procedure

- Collect a fresh urine sample in a clean container.
- Remove one urine test strip from the bottle.
- Dip the strip completely in urine for 1–2 seconds.
- Remove the strip and wipe excess urine with tissue.
- Wait for 30–60 seconds for the reaction to occur.
- Compare the color change with the standard color chart.
- record the results.



Parameters Tested in Urine Strip

1. pH

Indicates acidity or alkalinity of urine

Normal range: 4.5 – 8

2. Protein

Normally absent or very small amount

Presence indicates kidney disease or infection

3. Glucose

Normally absent

Presence indicates diabetes mellitus

4. Ketones

Formed when body breaks down fat

Seen in diabetes, starvation, or prolonged vomiting

5. Blood (Hemoglobin)

Indicates urinary tract infection, kidney stones, or injury.

6. Bilirubin

Normally absent

Presence suggests liver disease or jaundice

7. Urobilinogen

Small amount normally present

Increased in liver disorders

8. Nitrite

Indicates bacterial infection in urinary tract

9. Leukocytes

Indicates white blood cells in urine

Suggests urinary tract infection (UTI)

10. Specific Gravity

Indicates concentration of urine

Helps evaluate kidney function

Advantages

- Quick and easy test
- Non-invasive
- Requires minimal equipment
- Useful for routine health screening

Limitations

- Gives screening results only
- Confirmation requires laboratory tests
- Results may vary due to improper storage of strips

Clinical Importance

- Detection of diabetes
- Detection of kidney diseases
- Diagnosis of urinary tract infections
- Monitoring liver disorders
- Routine health checkups

