DEPARTMENT OF ZOOLOGY

SGK GOVERNMENT DEGREE COLLEGE- VINUKONDA

PALNADU DIST, A.P:522647

CERTIFICATE COURSE

In

DIPLOMA IN MEDICAL LABORATORY TECHNOLOGY

DATE: 26.03.2023 to 07-05-2023

2022-2023

About the Department of Zoology

The Department of Zoology came into existence in the college in 1989 with B. Sc BZC (Botany, Zoology, and Chemistry) combination. The Department aims to provide knowledge and skills to rural students. Faculty members give due importance to teaching and imparting knowledge to students and takes keen interest in participating and presenting research papers in seminars and symposia at different levels. Students are encouraged to take up individual study projects to meet their academic requirements. The department also organizes intercollegiate seminars and competitions in events like Quiz, Poster Presentation, and Paper Presentations etc....

Vision:

- To promote scientific thinking and research aptitude among students.
- To develop the skills of students for better employment prospects.

Mission:

- To create a conducive environment for learning knowledge and skills.
- To include additional inputs into the curriculum so as to promote academic and employable skills.
- To promote teaching through information and communication technology.
- To develop skilled personnel through vocational and entrepreneurial education.
- To promote awareness on ecological and environmental issues.
- To create research environment to promote scientific temper among students and to encourage them for higher studies.
- To sensitize the students on socio-economic issues by including related topics into the curriculum, and through co-curricular activities.

Courses offered

Course	Specialization	Intake	Medium
B.Sc	BZC	40	English

Faculty Profile:

Name of the Faculty	Qualifications	Position
B.R.K. Kishore	M.Sc, APSET	Lecturer in Zoology

About the Certificate Course

Medical Laboratory Technology clinical laboratory science helps diagnose, treat and prevent disease through clinical laboratory tests. It is complementary to medical science. It involves analysis of body matters such as fluid, tissue, and blood. It also covers micro-organism screening, chemical analyses, and cell count. These professionals, medical lab technicians and technologists play an important role in collecting information, sampling, testing, reporting and documenting medical Investigations.

This program opens up various avenues for students. After the completion of the program, as a fresher you can begin your career as:

- Blood banking
- Clinical Chemistry (chemical analysis of body fluids)
- Hematology (blood related)
- Immunology (study of immune system)
- Microbiology (study of bacteria and other disease organisms)
- Cytotechnology (study of human tissue)
- Urine analysis
- Coagulation
- Parasitology
- Blood Sample Matching
- Drug Efficacy Tests
- Serology

Professionals in this career can also opt for teaching jobs in various accounting institutions. Graduate professionals can work as freelancers in this field. These graduates can work independently or as freelancer for small ventures to maintain their account on day to day basis. There are lots of job opportunities available in India as well as in foreign countries for chartered accountants.

The main objectives of the course:

1. To undergo training in all fields of laboratory medicine (Biochemistry, Microbiology, Pathology and Blood bank departments respectively);
2. To understand Collect and prepare the sample;
3. To understand and perform special stains and smears
4. To develop the skills of grossing, cutting & staining procedures in histopathology;
5. To Counsel and screen the Donors and prepare the blood components to make students ready with required skill for employability in the job market.

LEARNING OUTCOMES:

After successful completion of this course students should be able to:

- Apply knowledge and technical skills associated with medical laboratory technology for delivering quality clinical investigations support.
- Perform routine clinical laboratory procedures within acceptable quality control parameters in hematology, biochemistry, immunohematology and Microbiology.
- Demonstrate technical skills, social behavior and professional awareness for functioning effectively as a laboratory technician
- Operate and maintain laboratory equipments utilizing appropriate quality control and safety procedures.
- Apply the fundamentals of research process to complete and present research studies that enrich the field of physical therapy.

SYLLABUS

Unit-I: Basics of Human Science

- Basic Human Science: Psychology, social and cultural anthropology, economics, global politics, and geography of Humans.
- Human Physiology: Describes the chemistry and physics behind basic body functions.
- Fundamentals of DMLT: Basic techniques and instruments used in all areas of medical laboratories.

Unit-II: Clinical Hematology and Pathology

- Clinical Hematology: The study of the numbers and morphology of the cellular elements of the blood.
- Clinical Pathology: The study of medical specialty concerned with the diagnosis of disease based on bodily fluids (Blood, Urine, and Tissue homogenates)

Unit-III: Clinical Biochemistry

- Clinical Biochemistry: Methods applied in laboratory medicine in which chemical, as well as biochemical methods.

Blood group testing

Aim

The main purpose of conducting this experiment is to understand the basic concept of the ABO blood group system and to know our blood group and type.

Materials Required

- Toothpicks
- Blood sample
- Alcohol Swabs
- Lancet
- Clean glass slide
- Sterile cotton balls
- Biohazard disposal container
- Monoclonal Antibodies (Anti-A, B, and D)

All these equipment will be readily available in a blood test tool kit.

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 if required.
- Mix the blood sample gently with the help of a toothpick and wait for a minute to observe the result.

Conclusion

Here is the chart which predicts the different types of blood groups along with its Rh factor.

Blood Type	A	B	O	AB
Rh-positive	A+	B+	O+	AB+

Rh-negative	A-	B-	O-	AB-

Precautions

Discard the alcohol swabs, lancet, cotton balls and toothpick after their use. Drop all the materials, including the glass slide into the biohazard disposal container after observing the result.

As mentioned above, there are four major blood groups and eight different blood types, collectively called the ABO Blood Group System. The groups are based on the presence or absence of two specific antigens and antibodies– A and B:

1. Group A- Antigen A and Antibody B.
2. Group B- Antigen B and Antibody A.
3. Group AB- Antigen A and B both and no Antibodies
4. Group O- No Antigens and both A and B Antibodies.

Other than this, there is a third kind of antigen called the Rh factor. Based on the presence or absence of this antigen (Rh factor), the four blood groups are classified into eight different blood types:

1. A positive – Presence of Rh+
2. A negative- Presence of Rh-
3. B positive- Presence of Rh+
4. B negative- Presence of Rh-
5. AB positive- Presence of Rh+
6. AB negative- Presence of Rh-
7. O positive- Presence of Rh+
8. O negative- Presence of Rh-

Important Questions on Blood Group Test:

- **What is a blood group test?**

A blood group test is a simple test used to determine the blood group of an individual. It is also called ABO typing.

- **How many types of blood groups are there?**

There are four major blood groups and are called the ABO Blood Group System. The types of blood groups are:

1. Blood Group A
2. Blood Group B
3. Blood Group AB
4. Blood Group O.

- **Which Blood group is called the universal donor and universal recipient?**

Type O blood group is called the universal donor, as it can be donated to recipients of any blood type. This is because type O blood group neither have A or B on the surface of the red blood cells.

Type AB blood group is called the universal recipient and can receive blood from the donors of any blood type. This is because type AB blood group have both A and B antigens on the surface of the red blood cells.

- **What determines blood type?**

The presence of antigen on the surface of the blood cell and the antibodies in the blood plasma can determine the blood groups or blood type of an individual. Moreover, these blood types or groups are inherited from our parents. Each parent passes one allele for blood type to their child. Therefore a child could have the same blood type as one of their parents.

- **What's the rarest blood type?**

As per the records, AB-negative is considered to be the rarest blood type. It is difficult to say which blood type is the rarest in the world and it depends on the frequency in requirement of certain blood types, which varies widely in different parts of the world.

- **Why is it important to know blood types?**

The ABO blood types are important as they are essential during the blood transfusions and to avoid further complications.

ESTIMATION OF HAEMOGLOBIN CONTENT

Background

Haemoglobin is a blood protein abbreviated as Hb. The haemoglobin molecule is made up ofhaem and globin. Haem is a pigment which contains iron which constitutes 4% of the haemoglobin molecule, while globin is a colourless protein constituting about 96% of total haemoglobin molecule. The functions of haemoglobin is to carry oxygen from the lungs to the tissues and to assist in the transport of carbon dioxide from the tissues to the lungs.

Principle: It is known as acid haematin method. It is also known as Sahli-Hellige method. It is a type of visual method (colorimetric method) of haemoglobin determination. In this method, blood is mixed with astrong acid. The haemoglobin breaks down and is converted to brown colour acid haematin. This is then diluted with water till the brown colour matches thatof the brown glass standard. The haemoglobin value is read directly from the scale

The apparatus used for estimation of haemoglobin content is called Sahli-Hellige Haemoglobinometer. It is a cabinet with centrally situated graduated glass tube. It has got arrangement of comparison of colour of the solution from graduated glass tube with that of standard colour strips situated on the visual part of it. the glass tube is graduated in millilitres and also in terms of grams of haemoglobin per 100 ml of blood. The haemoglobin pipette is a glass tube pipette with rubber sucking assembly. The tubular part of the pipette is graduatedin terms of micro millilitres.

Figure: Showing Components Of a Sahli- Hellige Haemoglobinometer

The aim of the experiment is to measure the amount of haemoglobin in the given sample of blood.

APPARATUS REQUIRED:

Spirit, cotton, needle, Sahli-Hellige haemoglobinometer, 0.1N HCl, Distilled water

PROCEDURE:

1. The graduated tube is filled with 0.1N HCl to the lowest point.

2. The finger is sterilized with70% alcohol and a bold prick is done with the help of a 23size needle.
3. The blood is sucked into the pipette.
4. Blood is collected upto 20µl maximum and then the blood is mixed with the acid in the graduated tube.
5. The blood and the acid mixture is mixed properly with the stirrer provided and it is kept undisturbed for 2-5 minutes.
6. After that distilled water is added drop by drop to dilute the quantity in the graduated tube.
7. The dilution is continued till the colour of the solution became same as the colour of the comparator.
8. When the colour matches, the graduated tube is taken out from the stand and the amount of solution in the tube is recorded.This gave us the amount of haemoglobin present in the blood.

RESULT:

The amount of haemoglobin present in the sample was found to be --------

INFERENCE:

Hb content in grams X 100 / 14.5 NORMAL VALUES:
Males = 14 to 18 grams
Females = 13 to 14 grams
Children = 10 to 13 grams

ENUMERATION OF WBC - TOTAL LEUKOCYTE COUNT (TLC)

White blood cell is a type of cells and an important component of blood that lacks hemoglobin, but has every cellular organelle, and defends the body against the foreign invasion or non-self. It is capable of motility and is also called as **leukocyte** or **white corpuscle**. The white blood cells are largely involved in ingesting foreign materials and cellular debris by acting as scavenger, in destroying infectious agents and cancer cells, or producing antibodies upon interaction with foreign antigens or infectious agents. They are larger than the RBC in size and also differ in the shape; white blood cells (WBCs) are rounded, amoeboid and irregular in shape while red blood cells (RBCs) are biconcave discoid. The size of WBCs is about 15μm while that of RBCs is 7.5μm.

Differences between Red Blood Cells (RBCs) and White Blood Cells (WBCs)

S.N.	Difference	Red Blood Cells (RBCs)	White Blood Cells (WBCs)
1.	Other name	Also called "Erythrocytes"	Also called "Leukocytes"
2.	Origin	They are produced in red bonemarrow.	Mostly bone marrow, alsoproduced in lymph nodes,spleen, etc.
3.	Nucleus	Nucleus Absent	Nucleus Present
4.	Size	Smaller than WBCs, 7.5μm	Larger than RBCs, 15μm
5.	Color	Filled with hemoglobin (Red)	Colorless, No Pigment
6.	Production	2 million RBCs per second	Fewer WBC than RBCs
7.	Life Span	RBCs have an average lifespanof 120 days	WBCs live anywhere from afew days (5-21 days)
8.	Number	5 million RBCs in every cubicmm of blood	3,000 – 7,000 WBCs in everycubic mm of blood
9.	Number Increments	Number increases duringexercises and high altitudes	Number increases during infection
10.	Process of Formation	Formation of RBC is called"Erythropoiesis"	Formation of WBS is called "Leucopoiesis"
11.	Shape	Circular, Biconcave	Rounded and Amoeboid, Irregular
12.	Motility	Non-Motile	Generally Motile
13.	Movement	Doesn't leaves Blood Vessels	Come out of blood Capillaries
14.	Rouleaux Formation	Form stacks called Rouleaux	Rouleaux formation absent
15.	Types	One Type	Five Types
16.	Circulatory system	Cardiovascular system	Cardiovascular and lymphatic systems.
17.	Function	Transport of Respiratory Gases(Oxygen and Carbon Dioxide)	Defense Mechanisms

A healthy adult human has between 4,500 and 11,000 WBCs per cubic millimeter of blood (5,000 – 10,000 in men & children, while 4,500 – 11,000 in women). The number of WBCs is not constant; it depends on various physiological conditions of the body. It fluctuates even in the day; resting period reflects lower number of WBCs, while intense physical activities, exertion and exercise results in the increase in the number of WBCs. However this fluctuation is normal and occurs in range. The deviation from the range is indicative of some pathological condition, like an abnormal increase in WBCs, i.e. **leukocytosis** can be observed in the case of convulsions, acute emotional reactions, pain, pregnancy, labor, infections, intoxication and certain cancers. On contrary, certain types of infections, such as viral infection, chronic anemia, malnutrition, and anaphylaxis (Greek ana-, meaning "against", and phylaxis, meaning "protection"; a severe, potentially life-threatening allergic reaction) result in abnormal decrease in the number of WBCs, a condition known as **leukopenia**. However certain drugs are also known to decrease the number of WBCs in the individual.

Principle

WBC diluting fluid is used for performing the WBC (Leucocyte) count. Glacial acetic acid lyses the red cells. Gentian violet slightly stains the nuclei of the leucocytes. The blood specimen is diluted 1:20 in a WBC pipette with the diluting fluid and the cells are counted under low power of the microscope by using a counting chamber. The number of cells in undiluted blood is reported per cumm (µl) of whole blood.

Equipment

1. Pipettes – Thoma peipette for WBCs or micropipette – 20µl is the desired volume.
2. Improved Neubauer's chamber with cover slips.
3. Light microscope.
4. Clean gauze

Reagents and solution

1. Diluting fluid or dilution buffer – Procured readymade or can be prepared as Türk's solution, such as from HiMedia, Mumbai, India.
2. 70% ethyl alcohol for cleaning microscope lens

Türk's solution: For WBC count, generally Türk's solution is used. Türk's solution is a hematological stain (crystal violet or aqueous methylene blue) that lyses the membrane of RBCs, WBCs and platelets within a blood sample, and stains the nuclei of the WBCs allowing easy identification and counting. This solution contains acetic acid that lyses the membrane. Composition of Turk's solution is following:

Glacial acetic acid *1ml*

Gentian violet *2ml (1% aqueous solution)*

Distilled water *100 ml Türk's solution*

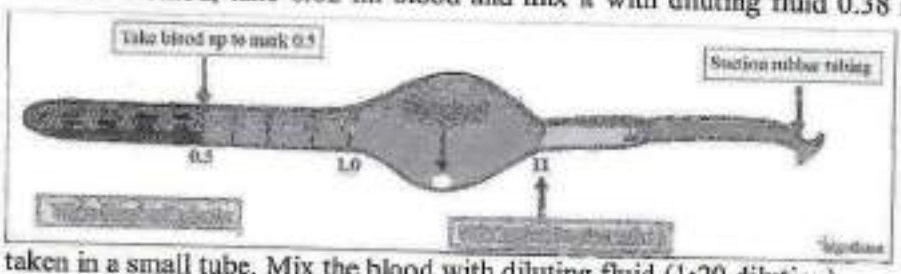
Preparation of Türk's solution:

- Add 2 ml of glacial acid (2 + 1), 1 mL gentian violet (1 %), and add 97 ml of distilled water to make up to 100 ml solution under fume hood.
- Add Gentian violet until the pale blue-violet colour is developed.

Procedure

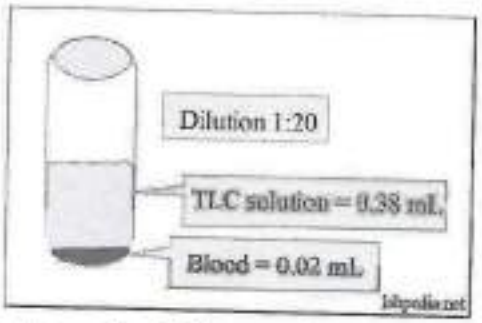
1. Clean the hemocytometer and its cover slip with 70% ethyl alcohol and then dry with a dry wipe.
2. Draw blood in a clean dry WBC pipette up to the mark 0.5 with all possible accuracy.
3. Draw the diluting fluid up to mark 11 (dilution 1 in 10).

   For tube method, take 0.02 ml blood and mix it with diluting fluid 0.38 ml of which is



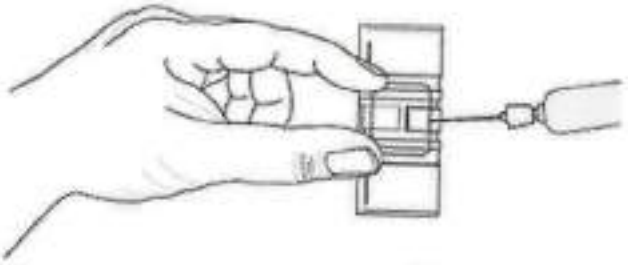
   taken in a small tube. Mix the blood with diluting fluid (1:20 dilution).

   Tube method is said to be more accurate in comparison to Thoma's pipette.
4. Mix the contents of pipette for minutes.
5. Dispel the first 4 drops of the contents.



6. Adjust the clean and dry Neubauers chamber. By holding the cover slip between the fingers at the edges, place the cover slip in such manner that both the ruled platforms are evenly covered. Now, load the Neubauers chamber with the pipette contents by holding the pipette at angle of 54 degree and touching the space between the cover slip and the chamber through pipette mouth. Neither too much nor meager, an appropriate drop of the

content is allowed to run under the cover slip by capillary action.



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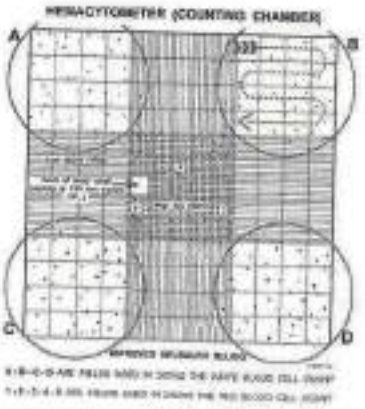
7. Allow 2 minute for setting of cells. After two minutes, starts counting. Only large squares of all the four corners are counted for WBC count. Central ruled small squares are for counting RBCs as shown in figure below. On Neubauers chamber, no letters, numbers and arrows are indicated.
8. Calculate the WBCs.



Letters, numbers and arrows are for illustration only.
Circles depict areas seen through the microscope.

Calculation

1. Count the cells in the Neubauer chamber. These are counted in the four large corner squares labeled as WBC and if the number is Y.

   The total area of each the corner large squares is $1mm^2$

   Since the depth is $^1/_{10}\ mm$.

   Therefore, the volume of each corner large square is $1\ mm^2 \times {}^1/_{10}\ mm = {}^1/_{10}\ mm^3$.

   Therefore, the volume of the four corner large squares is

$$^{1}/_{10} \times 4 = {}^{4}/_{10}\, mm^3$$

The number of WBCs in $1mm^3$ X

The number of WBCs in $^{4}/_{10}$ ..... Y

Therefore,

$$X = \frac{Number\ of\ WBCs\ in\ all\ large\ squers \times 1}{Volume\ of\ all\ corner\ large\ squares} = \frac{Y \times 1}{4/10} = \frac{1}{4/10} = Y \times \frac{10}{4} = Y \times 2.5$$

Since, dilution is 20.

Therefore number of WBC in 1mm^3, i.e. $X = Y \times 2.5 \times 20 = Y \times 50$

Therefore,

$$Total\ number\ of\ WBC = Number\ of\ WBC\ counted \times 50$$

On the other way, the calculation may be adapted as follows:

Since, the total number of WBCs is $\frac{Number\ of\ cells \times Dilution\ factor \times Depth\ factor}{Area\ count}$.

Where dilution factor is 20, depth factor is 10 and area count is 4.

No. of cells X Dilution factor X Depth factor Area count Where: Dilution factor = 20,Depth factor = 10, Area count = 4

2. If the count is low, i.e., below 4000 per mm^3, then use the dilution of 10.

Precautions

- Always wear protective gloves/protective clothing/eye protection/face protection beforehandling the dilution fluid.
- Follow good microbiological lab practices while handling specimens and culture.
- Standard precautions as per established guidelines should be followed while handlingclinical specimens.

Sources of errors

- Presence of microclots in the sample.
- Inadequate mixing of contents.
- Improper filling of the chamber.
- Improper dilution.
- Mistake in the calculation.

Significance

- It helps us to find out whether a person has got any infection, if yes then what type ofinfection.
- The TLC analysis makes us able to differentiate between acute and chronic infection.
- It helps us to find out certain types of cancer in a patient.
- It helps the physician to follow the patient with chemotherapy.
- It helps in analyzing the effect of drug.

White blood cell (WBC) count

Introduction and principle: The white blood cell count denotes the number of white blood cells per unit volume of whole blood.

- Normal WBC count range from **4000 - 11000 cells/ mm^3** this count varies with age.
- WBC count is useful to indicate infections or may be employed to follow the progress of certain diseases.
- White blood cells in the circulation are not white in the sense that a sheet of white paper is white, but in the sense that they are transparent and not colored.
- White cells are fewer in number than red cells.
- White blood cells are counted in a similar manner to red cells, using a haemocytometer.

Methods:

1- Manual method.
2- Electronic cell counting

Manual white cell count material and instruments

1. Anticoagulated whole blood.
2. Turk's diluting fluid composed of :
   - **Glacial acetic acid, 3 ml → to haemolyse RBCs.**
   - **Aqueous gention violet (1% w/v) 1 ml → to color the nuclei of WBC**
   - **Distilled water up to 100 ml.**
3. WBC pipette. Which is composed of a stem, mixing chamber, white bead inside the mixing chamber, aspiration tube (rubber sucking tube)
4. Haemocytometer (Neubauer's counting chamber) with a cover slip.
5. Microscope.
6. Lancet.
7. Cotton

Procedure:

- Obtain a drop of blood in the same manner as in RBC count. Draw blood up to the mark 0.5 using WBC pipette.
- Remove blood from outside of the pipette with a clean gauze.
- Aspirate diluting fluid up to mark 11. The dilution is 1:20.
- Gently rotate the pipette horizontally with your hand to ensure a proper amount of mixing for 3 minutes.
- After mixing discard the first four drops of the mixture.
- Fill the counting chamber with diluted blood by holding the pipette at 45° with the slide and allow the mixture to seep under the cover slip, the filled chamber should be allowed to stand for a minute prior to counting.
- Count the WBCs using the low power 10 x objectives.

- Count all WBCs in four large corner squares and add the result together to obtain the total number of cells counted. In counting the cells that touch the outside lines of the large square, count only those that touch the left and lower outside margin. The WBCs look like black dots.

PRECAUTIONS: Are the same as for RBC count.

Calculation:

Count the number (N) of cells in 4 large squares located at the four corners of the chamber. The size 4 large squares in which "N" numbers of cells are found is:

$1 \times 1 \times 1/10 \times 4 = 4/10\ mm^3$

Where 1 mm is the sideline of the large square, 1/10 mm is the depth of the counting chamber between coverslip and the ruling, 4 is the number of large squares used to count.

Therefore the total numbers of cells in 1 mm^3 are = N x 10/4 (diluted sample).

The actual total number of cells before dilution should be:

N x 10/4 x 20 = **N x 50**

Medical applications

Increased number of WBCs indicates that there is **leukocytosis** which could be physiological or pathological such as infection.

- **Physiological Conditions**

1. Age:

a. Newborn will always have an increased count. a newborn has a high white blood cell count, ranging from 9,000 to 30,000 leukocytes / mm^3. This number falls to adult levels within two weeks.

b. Childhood, pregnancy and delivery shows increased count.

c. There is no significant change in old age compared to adult values.

2. Females during pregnancy and parturition.

3. Stress like severe exercise, severe pain, and excitation.

4. Diurnal variation: WBC count may vary from hour-to-hour (highest count in evening and lowest count in morning).

5. Digestive leukocytosis (after digestion).

6. Injection of adrenaline.

7. After removal of spleen (spleenectomy)

- **Pathological Conditions**

1. Acute pyogenic infections (e.g. pneumonia, appendicitis and tonsillitis).

2. Leukemia (abnormal increase with immature cells) count may go up to 1,00,000 to 3,00,000 per cu mm.

3. Acute hemorrhage.

4. Tissue damage resulting from burns, operations, myocardial infarction.

5. Malignant neoplasms.

6. Metabolic disorder (e.g. gout, diabetic acidosis).

Leucopenia is a condition of decreased number of WBCs. Leukopenia occurs when the WBC falls

below 4,000 / mm^3. Patients with severe leukopenia should be protected from anything that interrupts skin integrity, placing them at risk for an infection that they do not have enough white blood cells to fight. For example, leukopenic patients should not have intramuscular injections, rectal temperatures or enemas. A WBC of less than 500 / mm^3 places the patient at risk for a fatal infection.

Physiological Leucopenia: Rare but sometimes due to:

1. Exposure to cold
2. Aspirin.
3. The WBC count tends to be lower in the morning and higher in the late afternoon.

Pathological Leucopenia

1. Infection → Typhoid, viral, or overwhelming bacterial infections (It is not uncommon for the elderly to fail to develop leukocytosis as a response to infection).
2. Starvation → Malnutrition.
3. Viral Infections → Measles, chickenpox, influenza and rubella
4. Drugs → Antimetabolites, antimicrobials (Sulfonamides, chloramphenicol)
5. Hematological disorders → Aplastic anemia, pernicious anemia, irradiation. WBC counts are age-related. It is not uncommon for the elderly to fail to develop leukocytosis as a response to infection

Assessment:

Students are assessed with a practical Exam conducted at the end of the course. The exam is conducted for 50 marks and the student has to score at least 25 marks to get the certificate. Three practical exams are conducted in the middle of the course in order to assess the students and act according to their learning levels.

Question Paper for Practical Examination

SGK Govt. Degree College, Vinukonda

CERTIFICATE COURSE OF DIPLOMA IN MEDICAL LABORATORY TECHNOLOGY

Question Paper-2022-23

Time: 1.00 **Max. Marks: 20**

PART-A (2x10=20)

1. **Execute blood group by using 'Blood grouping kit' with the help of your co - fellow gives result?**
2. **Explain the process of 118% analysis?**

S G K GOVERNMENT DEGREE COLLEGE

(Affiliated to Acharya Nagarjuna University, Guntur, A.P.)

NAAC with 'B'

Vinukonda, Palnadu District, Andhra Pradesh

DEPARTMENT OF ZOOLOGY OFFERS

Diploma in Medical Laboratory Technology[DLMT]

26.03.2023
To
07.05.2023

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List of Enrolled Students:

SGK GOVERNMENT DEGREE COLLEGE - VINUKONDA			
CERTIFICATE COURSE OF DIPLOMA IN MEDICAL LABORATORY TECHNOLOGY			
ACADEMIC YEAR 2022-23			
STUDENTS REGISTERED			
S. NO	**NAME OF THE STUDENTS**	**PROGRAMME**	**YEAR**
1	ANNEPOGU NANI	B.Sc (BZC)	I
2	ARLAGADDA JANI	B.Sc (BZC)	I
3	ARUDRA VENKATA RAO	B.Sc (BZC)	I
4	BHAVANASI SUJATHA RANI	B.Sc (BZC)	I
5	BILLA SRINIVASA RAO	B.Sc (BZC)	I
6	KANCHARALA DHANA LAKSHMI	B.Sc (BZC)	I
7	KESANAPALLI MANOHAR BABU	B.Sc (BZC)	I
8	KOYYALAMUDI SOWMYA	B.Sc (BZC)	I
9	PALADUGU BRAHMESWARI	B.Sc (BZC)	I
10	PALLE SANDEEP	B.Sc (BZC)	I
11	PALLE SANTHOSH	B.Sc (BZC)	I
12	PATRA GEORGE BABU	B.Sc (BZC)	I
13	SHAIK AMEERBASHA	B.Sc (BZC)	I
14	SHAIK HASEENA	B.Sc (BZC)	I
15	YEPURI SIVA NAGAMANI	B.Sc (BZC)	I

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SGKGDC, Vinukonda - 522 647,
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IQAC COORADINATOR
SGK GOVT DEGREE COLLEGE, VINUKONDA
PALNADU DIST - 522 647

PRINCIPAL
SGK. Govt. Degree College
Vinukonda - 522 647
Palnadu Dist.,

STUDENT SIGNATURES			
S. No	Name of the Students	Group	Signature
1	ANNEPOGU NANI	B.Sc (BZC)	Annepogu Nani
2	ARLAGADDA JANI	B.Sc (BZC)	A. Jani
3	ARUDRA VENKATA RAO	B.Sc (BZC)	A. Venkata Rao
4	BHAVANASI SUJATHA RANI	B.Sc (BZC)	B. Sujatha Rani
5	BILLA SRINIVASA RAO	B.Sc (BZC)	B Srinivasa Rao
6	KANCHARALA DHANA LAKSHMI	B.Sc (BZC)	K. Dhana lakshmi
7	KESANAPALLI MANOHAR BABU	B.Sc (BZC)	K. Manohar Babu
8	KOYYALAMUDI SOWMYA	B.Sc (BZC)	Koyyalamudi. Sowmya
9	PALADUGU BRAHMESWARI	B.Sc (BZC)	P. Brahmeswari
10	PALLE SANDEEP	B.Sc (BZC)	PALLE SANDEEP
11	PALLE SANTHOSH	B.Sc (BZC)	Palle santhose
12	PATRA GEORGE BABU	B.Sc (BZC)	P. George Babu
13	SHAIK AMEERBASHA	B.Sc (BZC)	Sk. Ameer Bhasha
14	SHAIK HASEENA	B.Sc (BZC)	S. Haseena.
15	YEPURI SIVA NAGAMANI	B.Sc (BZC)	Y. Siva Nagamani

SGK GOVERNMENT DEGREE COLLEGE - VINUKONDA

CERTIFICATE COURSE OF DIPLOMA IN MEDICAL LABORATORY TECHNOLOGY

ACADEMIC YEAR 2022-23

ATTENDANCE REGISTER

S. No	Name of the Student	26-03-2023	28-03-2023	29-03-2023	30-03-2023	31-03-2023	01-04-2023	04-04-2023	05-04-2023	06-04-2023	07-04-2023
		1	2	3	4	5	6	7	8	9	10
1	ANNEPOGU NANI	P	A	P	P	P	P	P	P	P	P
2	ARLAGADDA JANI	P	P	P	P	P	P	P	P	P	P
3	ARUDRA VENKATA RAO	P	P	P	P	P	P	P	P	P	P
4	BHAVANASI SUJATHA RANI	P	P	P	P	P	P	P	P	P	P
5	BILLA SRINIVASA RAO	P	P	P	P	P	P	A	P	P	A
6	KANCHARALA DHANA LAKSHMI	A	P	P	P	P	P	P	P	A	P
7	KESANAPALLI MANOHAR BABU	P	P	P	P	P	P	P	P	P	P
8	KOYYALAMUDI SOWMYA	P	P	P	P	P	P	P	P	P	P
9	PALADUGU BRAHMESWARI	P	P	P	P	P	P	P	P	P	P
10	PALLE SANDEEP	P	A	P	P	P	P	P	P	P	P
11	PALLE SANTHOSH	P	A	P	P	P	P	P	P	A	P
12	PATRA GEORGE BABU	P	P	A	P	P	P	P	P	A	P
13	SHAIK AMEERBASHA	P	P	P	P	A	P	P	P	P	P
14	SHAIK HASEENA	P	P	A	P	P	P	A	P	P	P
15	YEPURI SIVA NAGAMANI	P	P	A	P	P	A	P	P	P	P

SGK GOVERNMENT DEGREE COLLEGE - VINUKONDA

CERTIFICATE COURSE OF DIPLOMA IN MEDICAL LABORATORY TECHNOLOGY

ACADEMIC YEAR 2022-23

ATTENDANCE REGISTER

S. No	Name of the Student	08-04-2023	11-04-2023	12-04-2023	13-04-2023	18-04-2023	19-04-2023	20-04-2023	21-04-2023	22-04-2023	23-04-2023
		11	12	13	14	15	16	17	18	19	20
1	ANNEPOGU NANI	P	P	P	A	P	P	P	P	P	P
2	ARLAGADDA JANI	P	A	P	P	P	P	P	P	P	P
3	ARUDRA VENKATA RAO	P	P	P	P	P	P	P	A	P	P
4	BHAVANASI SUJATHA RANI	P	P	P	A	P	P	P	P	A	A
5	BILLA SRINIVASA RAO	P	P	P	A	A	P	P	P	A	P
6	KANCHARALA DHANA LAKSHMI	P	P	A	P	P	P	A	P	P	A
7	KESANAPALLI MANOHAR BABU	P	P	A	P	A	P	P	A	P	P
8	KOYYALAMUDI SOWMYA	P	P	A	P	P	A	P	P	A	P
9	PALADUGU BRAHMESWARI	P	P	P	P	P	P	P	P	A	P
10	PALLE SANDEEP	P	P	P	P	P	P	P	P	P	P
11	PALLE SANTHOSH	A	P	P	P	P	P	P	P	P	P
12	PATRA GEORGE BABU	A	A	P	P	P	P	P	P	P	P
13	SHAIK AMEERBASHA	A	P	P	P	P	P	P	P	A	P
14	SHAIK HASEENA	A	P	P	P	P	P	P	P	P	P
15	YEPURI SIVA NAGAMANI	A	P	P	P	P	P	P	P	P	P

B.R.K. KISHORE
Lecturer in Zoology
SGKGDC, Vinukonda - 522 647,
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SGK GOVERNMENT DEGREE COLLEGE - VINUKONDA

CERTIFICATE COURSE OF DIPLOMA IN MEDICAL LABORATORY TECHNOLOGY

ACADEMIC YEAR 2022-23

ATTENDANCE REGISTER

S. No	Name of the Student	25-04-2023	26-04-2023	27-04-2023	28-04-2023	30-04-2023	02-05-2023	03-05-2023	04-05-2023	05-05-2023	06-05-2023
		21	22	23	24	25	26	27	28	29	30
1	ANNEPOGU NANI	P	P	P	A	P	P	P	P	P	P
2	ARLAGADDA JANI	P	P	P	P	P	P	P	P	P	P
3	ARUDRA VENKATA RAO	P	P	P	P	P	P	P	P	P	P
4	BHAVANASI SUJATHA RANI	P	P	P	P	P	A	A	A	A	P
5	BILLA SRINIVASA RAO	P	P	P	A	P	P	P	P	P	P
6	KANCHARALA DHANA LAKSHMI	P	P	P	P	P	P	P	P	P	P
7	KESANAPALLI MANOHAR BABU	P	P	A	P	P	P	P	A	P	P
8	KOYYALAMUDI SOWMYA	P	P	P	A	P	P	A	P	P	P
9	PALADUGU BRAHMESWARI	A	P	P	P	P	P	P	P	P	P
10	PALLE SANDEEP	A	P	P	P	A	P	P	P	A	P
11	PALLE SANTHOSH	P	P	P	P	A	P	P	P	A	P
12	PATRA GEORGE BABU	A	P	P	A	P	P	P	A	P	P
13	SHAIK AMEERBASHA	P	P	P	A	P	P	P	P	A	P
14	SHAIK HASEENA	P	P	A	P	P	A	P	P	A	P
15	YEPURI SIVA NAGAMANI	P	P	P	A	P	P	A	P	P	P

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Vinukonda - 522 647
Palnadu Dist.,

EVALUATION SHEET

S. No	Student Name	Theory 30	Practical 20	Total 50	Pass / Fail
1	ANNEPOGU NANI	25	17	42	Pass
2	ARLAGADDA JANI	25	17	42	Pass
3	ARUDRA VENKATA RAO	25	17	42	Pass
4	BHAVANASI SUJATHA RANI	28	19	47	Pass
5	BILLA SRINIVASA RAO	25	17	42	Pass
6	KANCHARALA DHANA LAKSHMI	25	17	42	Pass
7	KESANAPALLI MANOHAR BABU	30	19	49	Pass
8	KOYYALAMUDI SOWMYA	27	18	45	Pass
9	PALADUGU BRAHMESWARI	28	19	47	Pass
10	PALLE SANDEEP	29	19	48	Pass
11	PALLE SANTHOSH	30	19	49	Pass
12	PATRA GEORGE BABU	28	19	47	Pass
13	SHAIK AMEERBASHA	25	17	42	Pass
14	SHAIK HASEENA	25	17	42	Pass
15	YEPURI SIVA NAGAMANI	27	18	45	Pass

B.R.K. KISHORE
Lecturer in Zoology
SGKGDC, Vinukonda - 522 647,
Palnadu Dt., A.P.

K.V.S. Rameswara Rao
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SGK GOVT DEGREE COLLEGE VINUKONDA
PALNADU DIST - 522 647

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Palnadu Dist.,

SGK GOVERNMENT DEGREE COLLEGE
VINUKONDA
PALNADU DISTRICT – 522647
(Affiliated to Acharya Nagarjuna University)

Brief Report

Department of Zoology organized a certificate course **"Diploma in Medical Laboratory"**. The duration of the course is one month (30 hours) and the course was conducted from **26-03-2023 to 07-05-2023**. This course is designed for people who want to learn the knowledge and skills they need to work in **Diploma in Medical laboratory**. **15** students of **I B.Sc (BZC)** registered in the course. Sri Rama K Kishore Behara, Lecturer in Zoology acted as the resource person for this course. During the course students are evaluated using assignment, Quizzes, and final exam. All the **15** students successfully completed the course and received certificates for completion.

B.R.K. KISHORE
Lecturer in Zoology
SGKGDC, Vinukonda - 522 647,
Palnadu Dt., A.P.

IQAC COORADINATOR
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PALNADU DIST - 522 647

PRINCIPAL
SGK. Govt. Degree College
Vinukonda - 522 647
Palnadu Dist.,

SGK GOVERNMENT DEGREE COLLEGE – VINUKONDA

Vinukonda, Palnadu Dt. Andhra Pradesh-522647

Certificate of Completion

This is to certify that Mr. /Mrs. ANNEPOGU NANI of I B.SC (BZC) has successfully completed Certificate Course on Diploma in MEDICAL LABORATORY TECHNOLOGY organized by Department of Zoology from 26.03.2023 to 07-05-2023.

Course Convener

Signature of the Principal

SGK GOVERNMENT DEGREE COLLEGE – VINUKONDA

Vinukonda, Palnadu Dt. Andhra Pradesh-522647

Certificate of Completion

This is to certify that Mr. /Mrs. ARLAGADDA JANI of I B.SC (BZC) has successfully completed Certificate Course on Diploma in MEDICAL LABORATORY TECHNOLOGY organized by Department of Zoology from 26.03.2023 to 07-05-2023.

Course Convener

Signature of the Principal

SGK GOVERNMENT DEGREE COLLEGE – VINUKONDA

Vinukonda, Palnadu Dt. Andhra Pradesh-522647

Certificate of Completion

This is to certify that Mr. /Mrs. ARUDRA VENKATA RAO of I B.SC (BZC) has successfully completed Certificate Course on Diploma in MEDICAL LABORATORY TECHNOLOGY organized by Department of Zoology from 26.03.2023 to 07-05-2023.

Course Convener

Signature of the Principal

SGK GOVERNMENT DEGREE COLLEGE – VINUKONDA

Vinukonda, Palnadu Dt. Andhra Pradesh-522647

Certificate of Completion

This is to certify that Mr. /Mrs. BHAVANASI SUJATHA RANI of I B.SC (BZC) has successfully completed Certificate Course on Diploma in MEDICAL LABORATORY TECHNOLOGY organized by Department of Zoology from 26.03.2023 to 07-05-2023.

Course Convener

Signature of the Principal

SGK GOVERNMENT DEGREE COLLEGE – VINUKONDA

Vinukonda, Palnadu Dt. Andhra Pradesh-522647

Certificate of Completion

This is to certify that Mr. /Mrs. BILLA SRINIVASA RAO of I B.SC (BZC) has successfully completed Certificate Course on Diploma in MEDICAL LABORATORY TECHNOLOGY organized by Department of Zoology from 26.03.2023 to 07-05-2023.

Course Convener

Signature of the Principal

SGK GOVERNMENT DEGREE COLLEGE – VINUKONDA

Vinukonda, Palnadu Dt. Andhra Pradesh-522647

Certificate of Completion

This is to certify that Mr. /Mrs. KANCHARALA DHANA LAKSHMI of I B.SC (BZC) has successfully completed Certificate Course on Diploma in MEDICAL LABORATORY TECHNOLOGY organized by Department of Zoology from 26.03.2023 to 07-05-2023.

Course Convener

Signature of the Principal

SGK GOVERNMENT DEGREE COLLEGE – VINUKONDA

Vinukonda, Palnadu Dt. Andhra Pradesh-522647

Certificate of Completion

This is to certify that Mr. /Mrs. KESANAPALLI MANOHAR BABU of I B.SC (BZC) has successfully completed Certificate Course on Diploma in MEDICAL LABORATORY TECHNOLOGY organized by Department of Zoology from 26.03.2023 to 07-05-2023.

Course Convener

Signature of the Principal

SGK GOVERNMENT DEGREE COLLEGE – VINUKONDA

Vinukonda, Palnadu Dt. Andhra Pradesh-522647

Certificate of Completion

This is to certify that Mr. /Mrs. KOYYALAMUDI SOWMYA of I B.SC (BZC) has successfully completed Certificate Course on Diploma in MEDICAL LABORATORY TECHNOLOGY organized by Department of Zoology from 26.03.2023 to 07-05-2023.

Course Convener

Signature of the Principal

SGK GOVERNMENT DEGREE COLLEGE – VINUKONDA

Vinukonda, Palnadu Dt. Andhra Pradesh-522647

Certificate of Completion

This is to certify that Mr. /Mrs. PALADUGU BRAHMESWARI of I B.SC (BZC) has successfully completed Certificate Course on Diploma in MEDICAL LABORATORY TECHNOLOGY organized by Department of Zoology from 26.03.2023 to 07-05-2023.

Course Convener

Signature of the Principal

SGK GOVERNMENT DEGREE COLLEGE – VINUKONDA

Vinukonda, Palnadu Dt. Andhra Pradesh-522647

Certificate of Completion

This is to certify that Mr. /Mrs. PALLE SANDEEP of I B.SC (BZC) has successfully completed Certificate Course on Diploma in MEDICAL LABORATORY TECHNOLOGY organized by Department of Zoology from 26.03.2023 to 07-05-2023.

Course Convener

Signature of the Principal

SGK GOVERNMENT DEGREE COLLEGE – VINUKONDA

Vinukonda, Palnadu Dt. Andhra Pradesh-522647

Certificate of Completion

This is to certify that Mr. /Mrs. PALLE SANTHOSH of I B.SC (BZC) has successfully completed Certificate Course on Diploma in MEDICAL LABORATORY TECHNOLOGY organized by Department of Zoology from 26.03.2023 to 07-05-2023.

Course Convener

Signature of the Principal

SGK GOVERNMENT DEGREE COLLEGE – VINUKONDA

Vinukonda, Palnadu Dt. Andhra Pradesh-522647

Certificate of Completion

This is to certify that Mr. /Mrs. PATRA GEORGE BABU of I B.SC (BZC) has successfully completed Certificate Course on Diploma in MEDICAL LABORATORY TECHNOLOGY organized by Department of Zoology from 26.03.2023 to 07-05-2023.

Course Convener

Signature of the Principal

SGK GOVERNMENT DEGREE COLLEGE – VINUKONDA

Vinukonda, Palnadu Dt. Andhra Pradesh-522647

Certificate of Completion

This is to certify that Mr. /Mrs. SHAIK AMEERBASHA of I B.SC (BZC) has successfully completed Certificate Course on Diploma in MEDICAL LABORATORY TECHNOLOGY organized by Department of Zoology from 26.03.2023 to 07-05-2023.

Course Convener

Signature of the Principal

SGK GOVERNMENT DEGREE COLLEGE – VINUKONDA

Vinukonda, Palnadu Dt. Andhra Pradesh-522647

Certificate of Completion

This is to certify that Mr. /Mrs. SHAIK HASEENA of I B.SC (BZC) has successfully completed Certificate Course on Diploma in MEDICAL LABORATORY TECHNOLOGY organized by Department of Zoology from 26.03.2023 to 07-05-2023.

Course Convener

Signature of the Principal

SGK GOVERNMENT DEGREE COLLEGE – VINUKONDA

Vinukonda, Palnadu Dt. Andhra Pradesh-522647

Certificate of Completion

This is to certify that Mr. /Mrs. YEPURI SIVA NAGAMANI of I B.SC (BZC) has successfully completed Certificate Course on Diploma in MEDICAL LABORATORY TECHNOLOGY organized by Department of Zoology from 26.03.2023 to 07-05-2023.

Course Convener

Signature of the Principal