[KE 874]   **Sub. Code : 5004**

B.Sc. (Medical Laboratory Technology) DEGREE
EXAMINATION.

First Year

Paper IV — PHYSICS AND PRINCIPLES OF
INSTRUMENTATION

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

1. Define 'Wavelength' and 'frequency'.

    Explain with a diagram how a spectrum is obtained in the laboratory.

    What are the difference between pure and impure spectrum?   (25)

2. Distinguish between AC and DC.

    Among the two which is more advantageous. If so what are the advantages?

    What is the principle of the transformer and stabiliser?   (25)

3. Write short notes on : $(5 \times 10 = 50)$

    (a) Sensitivity of a balance

    (b) Diffusion and osmosis

    (c) Refrigerators

    (d) Principle of fuse and its uses

    (e) P.H. meter.

[KI 874] **Sub. Code : 5004**

B.Sc. (Medical Laboratory Technology) DEGREE
EXAMINATION.

First Year

Paper IV — PHYSICS AND PRINCIPLES OF
INSTRUMENTATION

Time : Three hours Maximum : 100 marks

Answer ALL questions.

1. (a) State the laws of diffusion. (5)

   (b) Define diffusivity. Explain how would you
determine the diffusivity of a salt experimentally. (10)

   (c) Give a brief account of :

      (i) Hot air oven and

      (ii) Refrigerator. (10)

2. (a) Explain the working of a diode when it is
forward biased. (10)

   (b) Describe the parts, maintenance and use of an
incubator. (10)

   (c) State the laws of photoelectric emission. (5)

3. Write short notes on : $(5 \times 10 = 50)$

   (a) Spectrum and measurement of wavelength of
spectral lines of mercury spectrum.

   (b) Spherical aberration

   (c) Voltage stabiliser

   (d) Rough, chemical and electrical balance

   (e) Osmotic pressure.

[KJ 874]   Sub. Code : 5004

B.Sc. (MEDICAL LABORATORY TECHNOLOGY)
DEGREE EXAMINATION.

First Year

Paper IV — PHYSICS AND PRINCIPLES OF
INSTRUMENTATION

Time : Three hours	Maximum : 100 marks
Sec . A & B: Two hours and forty minutes	Sec. A & B : 80 marks
Sec . C : Twenty minutes	Sec. C : 20 marks

Section C must be answered in a **SEPARATE** Answer
Sheet provided as per the instructions given on
the first page of M.C.Q. Booklet.

Answer ALL questions.

SECTION A

1. (a) Explain spherical and chromatic aberrations. (5)

    (b) Explain the parts of a compound microscope. (5)

    (c) Explain the voltage stabilizer and its uses. (5)

2. (a) Explain ac and dc current. (5)

    (b) Explain the function of a diode half wave rectifier with necessary diagrams. (5)

    (c) Describe the electrical balance. Explain its sensitivity. What are the uses of it? (5)

SECTION B

3. Write short notes on : (10 × 5 = 50)

    (a) Diffusion.

    (b) Optical filters.

    (c) Mercury spectrum.

    (d) Electron microscope.

    (e) Transformers.

    (f) Spectrometer.

    (g) Amplifier.

    (h) Incubator.

    (i) Hot air oven.

    (j) Calorimeter.

[KL 874]   Sub. Code : 5004

B.Sc. (Medical Laboratory Technology) DEGREE
EXAMINATION.

First Year

Paper IV — PHYSICS AND PRINCIPLES OF
INSTRUMENTATION

Time : Three hours   Maximum : 100 marks

Sec. A & B : Two hours and   Sec. A & B : 80 marks
        forty minutes

Section C : Twenty minutes   Section C : 20 marks

Answer Sections A and B in the SAME Answer Book.
Answer Section C in the Answer Sheet provided.

SECTION A — $(2 \times 15 = 30$ marks$)$

1.   (a)   Explain the forward and reverse biased
status of a diode.   (5)

       (b)   Explain the functioning of diodes as rectifier.
                                                                    (7)

       (c)   How does photo electric emission find its use
in spectro photo meter?   (3)

2.   With a neat diagram, explain the principle,
construction and working of an electron microscope. (15)

SECTION B — $(10 \times 5 = 50$ marks$)$

3.   Write short notes on :

       (a)   Laws of diffusion and applications.

       (b)   Properties of matter.

       (c)   Uses of filters.

       (d)   Sensitivity of a chemical balance.

       (e)   Refrigerator.

       (f)   Uses of transformers.

       (g)   Hot air oven.

       (h)   Uses of centrifuges.

       (i)   Incubator.

       (j)   Flame photometer.

[KN 874]   Sub. Code : 5004

B.Sc. (Medical Laboratory Technology) DEGREE
EXAMINATION.

First Year

Paper IV — PHYSICS AND PRINCIPLES OF
INSTRUMENTATION

Time : Three hours   Maximum : 100 marks

Sec. A & B : Two hours and   Sec. A & B : 80 marks
      forty minutes

Sec. C : Twenty minutes   Sec. C : 20 marks

Answer Sections A and B in the **SAME** answer book.

Answer Section C in the answer sheet provided.

Answer ALL questions.

SECTION A — (2 × 15 = 30 marks)

1. (a) Explain briefly with necessary theory and
diagram, spherical and chromatic abberation.   (10)

    (b) State the laws of diffusion and osmosis.   (5)

2. (a) State the laws of photoelectric emission.   (5)

    (b) Compare the sensitivities of a chemical and
electrical balance.   (5)

    (c) Uses of earthing and fuses in electrical
wiring.   (5)

SECTION B — (10 × 5 = 50 marks)

3. Write short notes on :

    (a) Compound microscope.

    (b) Kinetic theory of gases.

    (c) White light spectra.

    (d) Basic and derived units.

    (e) Specific gravity.

    (f) Distillation.

    (g) pH meter.

    (h) Focal length of a lens.

    (i) Polarization.

    (j) Optical filters.

[KP 874]   Sub. Code : 5004

B.Sc (Medical Laboratory Technology) DEGREE
EXAMINATION.

First Year

Paper IV — PHYSICS AND PRINCIPLES OF
INSTRUMENTATION

Time : Three hours   Maximum : 100 marks

Descriptive : Two hours and   Descriptive : 80 marks
  · forty minutes

Objective : Twenty minutes   Objective : 20 marks

Answer ALL questions.

Write essays on :

1. (a) Give the kinetic theory of gases.   (5)

    (b) Explain the construction and working of a
transformer.   (5)

    (c) What is magnification? Describe a
microscope in its simplest form.   (5)

    (d) Compare compound microscope with electron
microscope.   (5)

2. (a) List the seven basic units.   (5)

    (b) Give the principle of a balance. Describe an
electronic balance.   (5)

    (c) Explain in detail the operation of a
photometer.   (5)

3. Explain the vital role played by diffusion and
osmosis in human physiology. Describe a method to
measure the viscosity of body fluids.   (15)

4. Write short notes on :   (6 × 5 = 30)

    (a) Osmosis

    (b) Incubator

    (c) Fuse

    (d) Refrigerator

    (e) Centrifuges

    (f) pH meter.

[KR 874] Sub. Code : 5004

B.Sc.(Medical Laboratory Technology) DEGREE EXAMINATION.

First Year

Paper IV — PHYSICS AND PRINCIPLES OF INSTRUMENTATION

Time : Three hours Maximum : 100 marks

Descriptive : Two hours and Descriptive : 80 marks
forty minutes

Objective : Twenty minutes Objective : 20 marks

Answer ALL questions.

Write essays on :

1. (a) Sketch the optical arrangement in a single beam spectrophotometer. (5)

 (b) Explain spherical and chromatic aberrations. (5)

 (c) Explain the function of a transformer and a rectifier. (5)

2. (a) Explain balance and its different types. (5)

 (b) Explain the parts of a compound microscope. (5)

 (c) Explain the Kinetic theory of gases. (5)

3. Write short notes on : (10 × 5 = 50)

 (a) Specific Gravity.

 (b) Basic and derived units.

 (c) Focal length of a lens.

 (d) Incubator.

 (e) Distillation apparatus.

 (f) pH meter.

 (g) Refrigeration.

 (h) Photoelectric emission.

 (i) Amplifier.

 (j) Optical Filters.

———————

[KS 874] **Sub. Code : 5004**

B.Sc. (Medical Laboratory Technology) DEGREE EXAMINATION.

First Year

Paper IV — PHYSICS AND PRINCIPLES OF INSTRUMENTATION

Q.P.Code : 725004

Time : Three hours Maximum : 100 marks

Descriptive : Two hours and forty minutes Descriptive : 80 marks

Objective : Twenty minutes Objective : 20 marks

Answer ALL questions.

I. Essay : (2 × 15 = 30)

(1) Explain the vital role played by diffusion and osmosis in human physiology. Describe a method to measure the viscosity of body fluids.

(2) With a neat diagram, explain the parts of a compound microscope and the functioning of the same. What are the merits and demerits in the use of compound microscopes in laboratories?

II. Write short notes on the following : (10 × 5 = 50)

(a) Diodes as rectifiers and photo diodes.

(b) Centrifuges and their uses.

(c) Use and care of Refrigerators.

(d) Transformers in daily life.

(e) Specific gravity and its uses.

(f) Water bath.

(g) Chemical balance.

(h) Autoclaves.

(i) Stabilizer.

(j) pH meter.

—————————

2 **[KS 874]**

August-2008

[KT 874]   **Sub. Code : 5004**

B.Sc. (Medical Laboratory Technology) DEGREE
EXAMINATION.

First Year

Paper IV — PHYSICS AND PRINCIPLES OF
INSTRUMENTATION

Q.P. Code : 725004

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

I.   Essays :   (2 × 15 = 30)

1.   (a)   What are basic and derived units? Explain.
                                                    (5)

     (b)   Explain different types of thermometers.   (5)

     (c)   Explain the function of electron microscope.
                                                    (5)

2.   (a)   Explain spherical aberration.   (5)

     (b)   Explain the function of simple microscope. (5)

     (c)   Explain the function of refrigerator.   (5)

II.	Write short notes on :	(10 × 5 = 50)

1.	Specific gravity.

2.	Diffusion.

3.	Kinetic theory of gases.

4.	Compound microscope.

5.	Chromatic aberration.

6.	Transformer.

7.	Incubator.

8.	pH meter.

9.	Rectifier.

10.	Different types of balance.

III.	Short answer questions :	(10 × 2 = 20)

1.	What are the constituent colours of white light?

2.	Mention the type of 'lenses'.

3.	What is the main difference between simple and compound microscope?

4.	What is the difference between AC and DC?

5.	Mention two advantages of earthing.

6.	What are the two uses of stabilizer?

7.	Two functions of rectifier.

8.	What is the difference between rough balance and electrical balance?

9.	Mention any two care of the chemical balance.

10.	Write two uses of autoclave.

_____

[KV 874]   **Sub. Code: 5004**

B.Sc. (Medical Laboratory Technology) DEGREE EXAMINATION

FIRST YEAR
Paper IV – PHYSICS AND PRINCIPLES OF INSTRUMENTATION
Q.P. Code : 725004

Time : Three hours   Maximum : 100 marks

Answer All questions.

I. Essays :   (2X15=30)
   1. a) Explain the kinetic theory of gases.   (5)
       b) Explain the function of a transformer and a rectifier.   (5)
       c) Explain the function of compound microscope.   (5)

   2. a) Explain the focal length of a lens and its magnification. (5)
       b) Explain the function of an incubator.   (5)
       c) Explain photo electric emission.   (5)

II. Write Short Notes on :   (10X5=50)
   1. Basic and derived units.
   2. Osmosis.
   3. Thermometers.
   4. Electron microscope.
   5. Spherical aberration.
   6. Amplifier.
   7. Refrigerator.
   8. Stethoscope.
   9. Distillation apparatus.
   10. Optical filters.

III. Short Answer Questions: (10X2=20)
   1. Define 'Volume'.
   2. Give the unit for viscosity.
   3. Define osmosis.
   4. State 'Charle's law'.
   5. Define 'wave length'.
   6. What is 'phase contrast'?
   7. Mention two applications of polarization.
   8. Why fuses are necessary in electricity?
   9. What is a stabilizer?
   10. Mention any two care of the electrical balance.

*****

B.Sc. (MEDICAL LABORATORY TECHNOLOGY) DEGREE EXAMINATION

FIRST YEAR

PAPER IV – PHYSICS AND PRINCIPLES OF INSTRUMENTATION

Q.P. Code: 725004

Time : Three Hours   **Maximum : 100 marks**

Answer ALL questions

I. Essays: **(2 x 15 = 30)**

1. State the laws of photo electric emission. Also explain the functioning of a sphectrophotometer and its uses.

2. Briefly explain the working of a chemical balance with a neat diagram. State the requirements of a good balance.

II. Write Short notes on: **(10 x 5 = 50)**

1. Cromatic aberration.
2. Simple microscope.
3. Electrical balance.
4. Oscillators.
5. Water bath.
6. Auto clave.
7. pH meter.
8. Centrifuge.
9. Rectifier.
10. Filters.

III. Short Answers on: **(10 x 2 = 20)**

1. Define viscosity.
2. Magnification.
3. Distillation.
4. Polarizing microscope.
5. Incubator.
6. Define speed.
7. Define aberration.
8. Transformer.
9. Melting point apparatus.
10. Einstein's photo electric equation.

****

B.Sc. (MEDICAL LABORATORY TECHNOLOGY) DEGREE EXAMINATION

FIRST YEAR

PAPER IV – PHYSICS AND PRINCIPLES OF INSTRUMENTATION

Q.P. Code: 725004

Time : Three Hours   **Maximum : 100 marks**

Answer ALL questions

I. Elaborate on: **(3 x 10 = 30)**

1. Explain in details about personnel monitoring device TLD and film badge and briefly mention about the three principle of radiation protection.

2. Describe the principle of fluorescent microscope and explain in details about each parts of the fluorescent microscope.

3. Write in detail about different types of transformer and its application in medical instruments.

II. Write notes on: **(8 x 5 = 40)**

1. Write briefly about rectifier and oscillator

2. Differentiate between transverse and longitudinal waves.

3. What is ionizing radiation and give three examples.

4. What are the properties of electromagnetic radiation?

5. Give a brief an account of semiconductor and oscillators.

6. Define the period of vibration, wave length, amplitude and frequency

7. Explain the phenomenon of total internal reflection with neat diagram

8. What has the highest heat capacity? Where do we apply the fact in our daily life?

III. Short Answers on: **(10 x 3 = 30)**

1. Define critical angle.

2. Auto transformer.

3. Current and Voltage.

4. What is the relationship between calorie and Joules?

5. What is the velocity of light and sound in air?

6. Thermocouples.

7. Define mass and volume.

8. What is ultrasound?

9. Types of charged particles with example.

10. GM counter.

****

B.Sc. (MEDICAL LABORATORY TECHNOLOGY) DEGREE EXAMINATION
FIRST YEAR
PAPER IV – PHYSICS AND PRINCIPLES OF INSTRUMENTATION

Q.P. Code: 725004

Time : Three Hours   **Maximum : 100 marks**

Answer ALL questions

I. Elaborate on: **(3 x 10 = 30)**

  1. Electron Microscope.

  2. Refrigerators.

  3. Production and Properties of Ultrasound and its application in Medicine.

II. Write notes on: **(8 x 5 = 40)**

  1. Determination of mass of an object using Physical Balance.

  2. Thermocouple.

  3. Spectrometer.

  4. Aberrations of lenses.

  5. Friction.

  6. Semi-Conductors.

  7. Full Wave Rectifier.

  8. Artificial Radioactivity.

III. Short Answers on: **(10 x 3 = 30)**

  1. Osmosis.

  2. Viscosity.

  3. Clinical Thermometer.

  4. Stabilizer.

  5. Capacitors.

  6. Ionizing Radiation.

  7. Total Internal Reflection.

  8. Compound Microscope.

  9. Personnel Monitoring Device - Film Badge.

10. Stochastic Effects.

****

B.Sc. MEDICAL LABORATORY TECHNOLOGY
FIRST YEAR
PAPER IV – PHYSICS & PRINCIPLE OF INSTRUMENTATION
Q.P. Code : 725004

Time : Three hours   **Maximum : 100 marks**
     (180 Mins)   Answer ALL questions in the same order.

I. Elaborate on:

	Pages (Max.)	Time (Max.)	Marks (Max.)
1. Explain the principle of calorimetry and techniques used in medical laboratory.	7	20	10
2. Describe the construction and working of physical balance and its application in laboratory.	7	20	10
3. Describe about radiation personnel monitoring devices used in hospital.	7	20	10

II. Write notes on:

1. Electromagnetic spectrum.	4	10	5
2. Distinguish between boiling and evaporation.	4	10	5
3. State Snell's law.	4	10	5
4. Rectifier.	4	10	5
5. Spectrometer.	4	10	5
6. Briefly write about artificial radioactivity.	4	10	5
7. Principle of radiation protection.	4	10	5
8. Incubator.	4	10	5

III. Short Answers on:

1. Define turn ratio.	2	4	3
2. Temperature.	2	4	3
3. Define power and energy.	2	4	3
4. What is the relationship between wave length and frequency.	2	4	3
5. Liquid scintillation counter.	2	4	3
6. Focal length and magnification.	2	4	3
7. Specific heat capacity.	2	4	3
8. Define Half-life.	2	4	3
9. Thermostat.	2	4	3
10. Charged particle radiation.	2	4	3

****

B.Sc. MEDICAL LABORATORY TECHNOLOGY
FIRST YEAR
PAPER IV – PHYSICS & PRINCIPLE OF INSTRUMENTATION
Q.P. Code : 725004

Time : Three hours   **Maximum : 100 marks**

Answer ALL questions.

I. Elaborate on: **(3x10=30)**

1. Explain the principle of PH meter and applications in clinical field.
2. Explain radio isotopes and its applications an medical field.
3. Describe construction of an electron microscope

II.Write Notes on: **(8x5=40)**

1. Temperature and its measurements
2. Electro magnetic spectrum
3. Personal monitoring devices
4. Dark field microscope
5. Construction and a working principle of centrifuge
6. Difference between reflection and refraction
7. Parts of a distillation apparatus
8. Magnification power

III.Short Answers on: **(10X3=30)**

1. Thermostat
2. Semi conductors
3. Incubator
4. Heat
5. Centripetal Force
6. Microscope
7. Isotopes
8. Transformers
9. Water bath
10. Velocity

****

B.Sc. MEDICAL LABORATORY TECHNOLOGY
FIRST YEAR
PAPER IV – PHYSICS AND PRINCIPLES OF INSTRUMENTATION

Q.P. Code : 725004

Time : Three hours   **Maximum : 100 marks**

Answer ALL questions.

I. Elaborate on: **(3x10 = 30)**

1. Write in detail about centrifuge, types and its application in Medicine
2. Give an elaborate note on Spectrophotometer
3. Write detail about GM Counter

II .Write Notes on: **(8x5 = 40)**

1. P^H Meter and its parts
2. Difference between Centrifugal force and Centripetal force
3. State Beer-Lambert's Law
4. Types of Microscopes
5. Incubator and its parts
6. Application of Ultra sound in medical field
7. Laws of Radio Activity
8. Differences of AC and DC Current in detail

III. Short Answers on: **(10x3 = 30)**

1. Specific gravity
2. Define Thermodynamics
3. Water bath care and usage
4. Ohm's Law
5. Frequency
6. Electrolysis
7. Un Interrupted Power Supply
8. Parts of distillation apparatus
9. Radio Activity and its types
10. Half-life period

***

B.Sc. MEDICAL LABORATORY TECHNOLOGY
FIRST YEAR
PAPER IV – PHYSICS AND PRINCIPLES OF INSTRUMENTATION

Q.P. Code : 725004

Time : Three hours   **Maximum : 100 marks**

Answer ALL questions.

I. Elaborate on: **(3x10 = 30)**

1. Briefly explain the working of a chemical balance with a neat diagram. State the requirements of a good balance.
2. Principle and production of ultrasound and its application in clinical field.
3. What is the basic principle of transformer? Explain the two types of transformers and sources of power loss.

II .Write Notes on: **(8x5 = 40)**

1. Types of centripetal Force
2. Law of thermodynamic
3. Explain the aberration types with diagrams
4. Explain the working of simple microscope
5. Explain photoelectric emission
6. Principle and working of GM Counter
7. How isotopes are produced? Uses in medical field
8. Explain the working and uses of film badge

III. Short Answers on: **(10x3 = 30)**

1. Principle of Centrifuge uses in clinical field
2. Types of Thermometer
3. Types of refrigerators
4. Explain Total internal reflection
5. Application of Laser in medicine
6. Define Power
7. State Ohm's law
8. What are UPS and its uses in clinical field?
9. What are rectifier and its uses?
10. Principle of radiation protection

***

B.Sc. MEDICAL LABORATORY TECHNOLOGY
FIRST YEAR
PAPER IV – PHYSICS AND PRINCIPLES OF INSTRUMENTATION

Q.P. Code : 725004

Time : Three hours   **Maximum : 100 marks**

Answer ALL questions.

I. Elaborate on: **(3 x 10 = 30)**

1. Explain Refrigation Techniques and give its types and uses of it in Laboratories.
2. Explain the pH meter and its uses in medical field.
3. Explain artificial radioactivity and give its applications.

II. Write Notes on: **(8 x 5 = 40)**

1. Chemical Balances.
2. Kinetic theory of gases.
3. Spherical and Chromatic aberrations.
4. Explain types of LASERs.
5. Full wave Bridge rectifier.
6. Electrolysis.
7. Photoelectic emissions.
8. Elecromagnetic raditations.

III. Short Answers on: **(10 x 3 = 30)**

1. Define Diffusion
2. Define Specific Gravity
3. Difference between heat and temperature.
4. Write about the thermal capacity
5. What is dispersion?
6. What is Magnification Power?
7. Define Velocity.
8. What is ohms law?
9. What is called Turns ratio?
10. Decay Constant.

*****

B.Sc. MEDICAL LABORATORY TECHNOLOGY
FIRST YEAR
PAPER IV – PHYSICS AND PRINCIPLES OF INSTRUMENTATION

Q.P. Code : 725004

Time : Three Hours   **Maximum : 100 Marks**

Answer ALL questions.

I. Elaborate on: **(3 x 10 = 30)**

1. Mention the types of microscopes and explain about Simple microscope in detail.
2. Explain the distillation apparatus and label its parts with a neat diagram.
3. Explain balances and give its applications.

II. Write Notes on: **(8 x 5 = 40)**

1. Water Bath.
2. Filters.
3. UPS.
4. Explain white light spectra.
5. Properties of sound.
6. Laws of radioactivity.
7. Difference between AC and DC current.
8. Scintillation counter.

III. Short Answers on: **(10 x 3 = 30)**

1. Define mass and volume.
2. Define viscosity.
3. Cooling by evaporation.
4. Write about Snells law of refraction.
5. What is frequency?
6. What is current and voltage?
7. Define electromagnetic spectrum.
8. Einstein's photoelectric emission.
9. Basic principle of radiation protection.
10. Electomagnetic spectrum.

*****

B.Sc. MEDICAL LABORATORY TECHNOLOGY
FIRST YEAR
PAPER IV – PHYSICS AND PRINCIPLES OF INSTRUMENTATION

Q.P. Code : 725004

Time : Three Hours   **Maximum : 100 Marks**

Answer ALL questions.

I. Elaborate on: **(3 x 10 = 30)**

1. Explain the working of a chemical balance with a neat diagram.
2. Explain the principle of calorimetry and techniques used in laboratory.
3. Write in detail about different types of transformers and its applications in medical instruments.

II. Write Notes on: **(8 x 5 = 40)**

1. Difference between Centrifugal force and Centripetal force.
2. Incubator.
3. Spherical aberrations.
4. Full wave rectifier.
5. Isotopes used in medicine.
6. Electromagnetic spectrum.
7. Auto clave.
8. Thermostat.

III. Short Answers on: **(10 x 3 = 30)**

1. Define distillation.
2. What is ultrasound?
3. Difference between current and voltage.
4. What is thermal capacity?
5. Focal length.
6. Why fuse is necessary in electricity?
7. What is natural radioactivity?
8. What is velocity of sound in air?
9. Define viscosity.
10. What is electrolysis?

*****

B.Sc. MEDICAL LABORATORY TECHNOLOGY
FIRST YEAR
PAPER IV – PHYSICS AND PRINCIPLES OF INSTRUMENTATION

Q.P. Code : 725004

Time : Three Hours   **Maximum : 100 Marks**

Answer ALL questions.

I. Elaborate on: **(3 x 10 = 30)**

1. Explain the principle of pH meter and application in clinical field.
2. Explain the construction and working of electron microscope.
3. Explain the construction and working of physical balance and applications in laboratory.

II. Write Notes on: **(8 x 5 = 40)**

1. Refrigerators.
2. Autoclave.
3. Chromatic aberrations.
4. Transformer.
5. Isotopes used in medicine.
6. Properties of electromagnetic radiation.
7. Clinical thermometer.
8. Personnel monitoring device-TLD.

III. Short Answers on: **(10 x 3 = 30)**

1. Define Viscosity.
2. Explain centrifuge principle.
3. State Ohms law.
4. What is specific heat capacity?
5. Explain wavelength and frequency.
6. Why fuse is necessary in electricity?
7. What is artificial radioactivity?
8. What is velocity of light in air?
9. Define osmosis.
10. What is ionizing radiation? Give examples.

*****

B.Sc. MEDICAL LABORATORY TECHNOLOGY
FIRST YEAR
PAPER IV – PHYSICS AND PRINCIPLES OF INSTRUMENTATION

Q.P. Code : 725004

Time : Three Hours   **Maximum : 100 Marks**

Answer ALL questions.

I. Elaborate on: **(3 x 10 = 30)**

1. Explain in detail about the construction and working of Electron Microscope.
2. What are radio isotopes and list out the isotopes used in medical field and mention its therapeutic importance.
3. Draw a neat sketch of a refrigerator and explain in detail about its working.

II. Write Notes on: **(8 x 5 = 40)**

1. Draw the neat diagram of physical balance and write a note on its sensitivity.
2. Write short notes on centripetal and centrifugal forces with examples.
3. What is a thermostat? And explain its principle.
4. Write short notes on spherical and chromatic aberrations.
5. What is the basic principle of a spectrometer? Explain its role in the optics field.
6. Draw a neat sketch of a simple microscope and explain its working.
7. Write short notes on electrolytes which are used in the medical field.
8. Obtain an expression for the radioactive decay constant.

III. Short Answers on: **(10 x 3 = 30)**

1. Define mass and volume and write the units.
2. What is Ph meter and write its use?
3. State the I law of thermodynamics.
4. Define heat and write its unit.
5. What is an incubator?
6. What is ultrasound?
7. Define wavelength and frequency.
8. What is distillation?
9. State Ohm's law.
10. What is radioactivity?

*****

B.Sc. MEDICAL LABORATORY TECHNOLOGY
FIRST YEAR
PAPER IV – PHYSICS & PRINCIPLES OF INSTRUMENTATION

Q.P. Code: 725004

Time: Three Hours   **Maximum: 100 Marks**

Answer all questions

I. Elaborate on: **(3 x 10 = 30)**

1. What are the types of balance? Write a note about its use in laboratory and care of the balance.
2. Properties and problems of ultrasound and its application in medical field.
3. Describe about radiation personnel monitoring devices used in hospital.

II. Write notes on: **(8 x 5 = 40)**

1. Auto clave.
2. Rectifier.
3. Write about centrifugal and centripetal force.
4. Viscosity.
5. Lasers.
6. Artificial radioactivity.
7. Electro magnetic radiations.
8. Filters.

III. Short answers on: **(10 x 3 = 30)**

1. Magnification.
2. Polarizing microscope.
3. Aberrations.
4. Charle's Law.
5. How to take care of the Electrical balance?
6. What are the types of lenses?
7. What are the difference between simple and compound microscope?
8. Diodes.
9. Amplifier.
10. Kinetic theory of gases.

****

B.Sc. MEDICAL LABORATORY TECHNOLOGY

FIRST YEAR

PAPER IV – PHYSICS & PRINCIPLES OF INSTRUMENTATION

Q.P. Code: 725004

Time: Three Hours   **Maximum: 100 Marks**

Answer all questions

I. Elaborate on: **(3 x 10 = 30)**

1. What are the types of microscope and elaborate note on compound microscope?
2. Write a note on spectrophotometer with its applications in the laboratory.
3. Explain the principle and its applications of pH meter.

II. Write notes on: **(8 x 5 = 40)**

1. Differentiate between Transverse and Longitudinal waves.
2. Give a brief of semiconductor and oscillators.
3. Incubator.
4. Thermocouple.
5. Aberration of lenses.
6. Write a note about AC & DC current.
7. UPS.
8. Gamma Chambers.

III. Short answers on: **(10 x 3 = 30)**

1. Ionizing radiation.
2. Isotopes used in medicine.
3. OHM's Law.
4. Fuse.
5. Electrolysis.
6. Stabilizer.
7. Thermometer.
8. Define critical angle.
9. Define Mass and Volume.
10. Types of charged particle with example.

****

B.Sc. MEDICAL LABORATORY TECHNOLOGY
FIRST YEAR
PAPER IV – PHYSICS & PRINCIPLES OF INSTRUMENTATION

Q.P. Code: 725004

Time: Three Hours   **Maximum: 100 Marks**
Answer all questions

I. Elaborate on: **(3 x 10 = 30)**

1. What are the types of refrigerators and its application in medical field?
2. Write in detail about the principle of calorimetry and techniques used in medical laboratory.
3. What are the types of transformer and its application in medical instruments?

II. Write notes on: **(8 x 5 = 40)**

1. Septic gravity and its uses.
2. Photo electric emission.
3. Distilation apparatus.
4. Hot air oven.
5. Types and its uses of centrifuges.
6. Calorimeter.
7. Application Laws of Thermodynamics.
8. Thermostat.

III. Short answers on: **(10 x 3 = 30)**

1. Osmotic pressure.
2. Phase contrast microscope.
3. Advantages of earthing and fuses in electrical connections.
4. Define Reflection, Refraction and Critical angle.
5. Define Velocity and Frequency.
6. Calorific values of food.
7. Define Diffusion and Osmosis.
8. Define Mass and Volume.
9. OHM's Law.
10. Fuse.

****

B.Sc. MEDICAL LABORATORY TECHNOLOGY
FIRST YEAR
PAPER IV – PHYSICS & PRINCIPLES OF INSTRUMENTATION

Q.P. Code: 725004

Time: Three Hours   **Maximum: 100 Marks**

Answer all questions

I. Elaborate on: **(3 x 10 = 30)**

1. Describe the principle of fluorescent microscope and explain in details about each part of the fluorescent microscope.
2. Give an Elaborate note on spectrophotometer.
3. Describe about radiation personnel monitoring devices used in hospital.

II. Write notes on: **(8 x 5 = 40)**

1. Water Bath.
2. Refrigerator.
3. Osmosis.
4. Rectifier.
5. Filter.
6. What is ionizing radiation and give three examples?
7. Kinetic theory of gases.
8. Centrifuge.

III. Short answers on: **(10 x 3 = 30)**

1. Define – Wave length.
2. What is Stabillizer?
3. Charle's law.
4. Define mass and volume.
5. GM counter.
6. Define – Current, Voltage.
7. pH meter.
8. What is Ultrasound?
9. Specific gravity.
10. Thermometer.

****

B.Sc. MEDICAL LABORATORY TECHNOLOGY
FIRST YEAR
PAPER IV – PHYSICS & PRINCIPLES OF INSTRUMENTATION

Q.P. Code: 725004

Time: Three Hours   **Maximum: 100 Marks**

Answer all questions

I. Elaborate on: **(3 x 10 = 30)**

1. Explain the principle and its applications of pH meter.
2. Write in detail about different types of transformer and its application in medical instrument.
3. Mention the types of microscope and explain about simple microscope in detail.

II. Write notes on: **(8 x 5 = 40)**

1. Differentiate between AC and DC current.
2. Autoclave.
3. Thermostat.
4. How isotopes are produced? Uses in medical field.
5. UPS.
6. Full wave rectifier.
7. Difference between centrifugal force and centripetal force.
8. State Beer – Lambert's law.

III. Short answers on: **(10 x 3 = 30)**

1. Osmosis.
2. Incubator.
3. Velocity.
4. Ohm's law.
5. Half-life period.
6. Semi conductors.
7. What is electrolysis?
8. Focal length.
9. What is velocity of sound in air?
10. Diodes.

****

B.Sc. MEDICAL LABORATORY TECHNOLOGY
FIRST YEAR
PAPER IV – PHYSICS & PRINCIPLES OF INSTRUMENTATION

Q.P. Code: 725004

Time: Three Hours **Maximum: 100 Marks**

Answer all questions

I. Elaborate on: (3 x 10 = 30)

1. Briefly explain the working of a chemical balance with a neat diagram and state the requirement of a good balance.
2. Describe construction of an electron microscope.
3. Principle and production of ultrasound and its application in clinical field.

II. Write notes on: (8 x 5 = 40)

1. Explain photoelectric emission.
2. Principle and working of GM counter.
3. Incubator and its part.
4. Temperature and its measurement.
5. Difference between reflection and refraction.
6. Parts of a distillation apparatus.
7. Full wave rectifier.
8. Uses of Filters.

III. Short answers on: (10 x 3 = 30)

1. Magnification.
2. Define speed.
3. Charle's law.
4. What is stabilizer?
5. Refrigerator.
6. Advantages of earthing and fuses in electrical connections.
7. What is Heat?
8. Frequency.
9. Semi conductors.
10. Charged particle radiation.

****

B.Sc. MEDICAL LABORATORY TECHNOLOGY
FIRST YEAR
PAPER IV – PHYSICS & PRINCIPLES OF INSTRUMENTATION

Q.P. Code: 725004

Time: Three Hours   **Maximum: 100 Marks**
Answer all questions

I. Elaborate on: **(3 x 10 = 30)**

1. Describe in detail, the construction and working of centrifuge. What are the applications of centrifuge in medical laboratory?
2. Describe in detail, the principle of caloriemetry and techniques used in medical laboratory.
3. What are radio isotopes and what are the uses of radioisotopes in medicine?

II. Write notes on: **(8 x 5 = 40)**

1. pH meter.
2. Construction and working of transformer.
3. Fluorescent microscope.
4. Photoelectric emission.
5. Electromagnetic spectrum.
6. TLD badge.
7. Specific gravity and its applications.
8. Production of ultrasound.

III. Short answers on: **(10 x 3 = 30)**

1. Define mass and volume.
2. Thermometer types.
3. Magnification.
4. Define critical angle.
5. Current and voltage.
6. Types of transformers.
7. Scintillation counter.
8. Focal length.
9. What is the velocity of sound in air and soft tissue?
10. Gamma chamber.

****

[AHS 0321]   **MARCH 2021**   **Sub. Code: 5004**
(AUGUST 2020 EXAM SESSION)
B.Sc. MEDICAL LABORATORY TECHNOLOGY
FIRST YEAR (From 2010-2011 onwards)
PAPER IV – PHYSICS AND PRINCIPLES OF INSTRUMENTATION
Q.P. Code : 725004

Time: Three hours   **Answer ALL Questions**   **Maximum: 100 Marks**

I. Elaborate on: **(3 x 10 = 30)**

1. Describe in detail, the construction and working of centrifuge. What are the applications of centrifuge in medical laboratory.
2. Describe in detail, the construction and working of electron microscope. What are the advantages compared to other microscopes.
3. Describe about radiation personnel monitoring devices used in hospitals.

II. Write notes on: **(8 x 5 = 40)**

1. Specific gravity and its applications.
2. Kinetic Theory of gases.
3. Laser types and applications.
4. Production of ultrasound.
5. Construction and working of transformer.
6. Radioactivity.
7. Rectifier.
8. Incubator.

III. Short answers on: **(10 x 3 = 30)**

1. Osmosis.
2. Thermostat.
3. Total internal Reflection.
4. What is ultrasound?
5. Fuse.
6. What is wavelength?
7. What is UPS?
8. Application of Ultrasound in medicine.
9. Half life.
10. Electromagnetic spectrum.

****

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0422]   **APRIL 2022**   **Sub. Code:5004**
(FEBRUARY 2021 & AUGUST 2021 EXAM SESSIONS)
B.Sc., MEDICAL LABORATORY TECHNOLOGY
FIRST YEAR (From 2010-2011 onwards)
PAPER IV – PHYSICS & PRINCIPLES OF INSTRUMENTATION
Q.P. Code: 725004

Time: Three Hours   **Maximum : 100 Marks**

Answer All questions

I.   **Elaborate on :**   **(3X10=30)**

1. Elaborate on the parts of a Microscope. Mention the various types of Microscope. Distinguish between Optical microscope and Electron microscope, with their advantages and disadvantages.
2. What are Radio- isotopes? Elaborate on the isotopes used in medicine. What are the basic principles of radiation protection?
3. Elaborate on the principle and uses of Thermostat and Thermocouple in a laboratory. Add a note on Thermal capacity and Specific heat capacity.

II.   **Write Notes on :**   **(8X5=40)**

1. Units and Measurements.
2. Spherical and Chromatic aberration.
3. Principle of Autoclave & its uses.
4. Advantages of Earthing & fuses in electric connection.
5. Parts and Uses of uninterrupted power supply equipment.
6. Principle of Diodes & its uses.
7. Role of thermometer in a laboratory.
8. Importance of Food with Calorific values.

III.   **Short Answers on :**   **(10X3=30)**

1. Specific gravity.
2. Photoelectric emission.
3. Ohm's Law.
4. Half- life period.
5. Centrifugal force and Centripetal force.
6. Uses of Transformers and Stabilizers.
7. Diffusion Laws.
8. Define Heat. Mention its unit.
9. Uses of Filters.
10. Define Evaporation.

*****

[AHS 1122]   **NOVEMBER 2022**   Sub. Code: 5004

B.Sc. MEDICAL LABORATORY TECHNOLOGY
FIRST YEAR (Regulation 2010-2011)
PAPER IV – PHYSICS & PRINCIPLES OF INSTRUMENTATION
Q.P. Code: 725004

Time: Three Hours   **Maximum : 100 Marks**
Answer All questions

I.   Elaborate on :   (3X10=30)

1. Define Mass and Specific Gravity. Elaborate on the Properties of Matter.

2. Elaborate with a diagram, the principle and working of an Electron Microscope. Write about the advantages and disadvantages of an Electron Microscope.

3. What is Spectrophotometer? Elaborate on its parts, maintenance and applications of spectrophotometer in a medical laboratory.

II. Write Notes on :   (8X5=40)

1. Water bath.
2. Chemical Balance.
3. Voltage Stabiliser.
4. Laws of diffusion and its applications.
5. Personal Monitoring Device.
6. Application of Electrolytes in Medicine.
7. Lasers and its Applications in Medicine.
8. Role of pH meter in a lab.

III. Short Answers on :   (10X3=30)
1. What is Dispersion?
2. Types of Refrigerators.
3. Focal length and Magnification.
4. Define Osmosis.
5. Turns of ratio.
6. Law of Thermodynamics.
7. Name three isotopes and its uses.
8. Decay constant.
9. Gamma radiation.
10. Define Frequency and Wavelength.

******

[AHS 1123]   **NOVEMBER 2023**   **Sub. Code: 5004**

B.Sc. MEDICAL LABORATORY TECHNOLOGY
FIRST YEAR (Regulations 2010-2011 & 2018-2019 onwards)
PAPER IV – PHYSICS & PRINCIPLES OF INSTRUMENTATION
Q. P. Code: 725004

Time: Three hours   **Maximum : 100 Marks**

Answer ALL Questions

I. Elaborate on: (3 x 10 = 30)

1. Discuss briefly about distillation apparatus with neat sketch.
2. Write an elaborate note on Electron Microscope.
3. Explain the principle and working of Refrigerator with neat diagram.

II. Write notes on: (8 x 5 = 40)

1. Centripetal and centrifugal forces.
2. Chemical balance with a neat sketch.
3. Thermometry and its types.
4. Spherical and Chromatic aberrations.
5. Fluorescent microscope.
6. Types of Transformers.
7. Radioactive decay series.
8. Electrolytes and their application in Medicine.

III. Short answers on: (10 x 3 = 30)

1. Define Viscosity.
2. What is Radioactivity and give its unit?
3. What is Specific Gravity?
4. What are the applications of Law of Thermodynamics?
5. What are physical properties of Ultrasound?
6. What is diffusion?
7. State Ohm's Law.
8. What are Diodes?
9. What is Rectification?
10. What is Magnification power?

****