

**EXPT NO. 1: REISTANCE PER UNIT LENGTH OF WIRE**

1. **What is a resistance?**

**Ans:** It is the opposition offered by a conductor for the flow of current in it.

2. **What are the factors on which resistance of a conductor depends?**

**Ans:** It depends on resistivity ( $\rho$ ), length (L) and area of cross-section (A) of the conducting wire.

3. **State Ohm's law.**

**Ans:** at constant temperature and other physical conditions are same, electric current (I) in a conductor is directly proportional to the potential difference (V) across its ends.

4. **What is the function of rheostat in the experiment?**

**Ans:** to vary current in a circuit.

5. **What is the SI unit of resistance?**

**Ans:** ohm ( $\Omega$ )

6. **What is meant by one ohm resistance?**

**Ans:** resistance of a conductor is said to be one ohm if a potential difference of one volt across its ends produces a current of one ampere in it.

7. **What is the function of resistance in a circuit?**

**Ans:** To control current in the circuit.

8. **How does current vary with resistance?**

**Ans:** at constant potential difference, current is inversely proportional to resistance.

9. **Why an ammeter is not connected in parallel?**

**Ans:** If an ammeter is connected in parallel, the effective resistance of the circuit decreases. A large current flows in the circuit which may damage the ammeter.

10. **Why a voltmeter is not connected in series?**

**Ans:** If a voltmeter is connected in series, the effective resistance of the circuit increases and hence current in the circuit decreases.

**EXPT NO. 2: RESISTIVITY OF THE MATERIAL OF A WIRE**

1. **What is specific resistance (resistivity)?**

**Ans:** It is the resistance offered by a conductor of unit length and unit area of cross-section at constant temperature.

2. **Why manganine or constantan or nichrome wire is used in a rheostart?**

**Ans:** It is because, they have high resistivity ( $\rho$ ) and low temperature co-efficient of resistance ( $\alpha$ ).

3. **How does resistivity of wire depend on length and area of cross-section of its wire?**

**Ans:** Resistivity ( $\rho$ ) of a conductor does not depend on length and area of cross-section of its wire.

4. **What is resistance of a wire?**

**Ans:** It is the opposition offered by the wire for the flow of current in it.

5. **What is conductivity?**

**Ans:** It is the reciprocal of resistivity ( $\sigma = 1/\rho$ )

6. **What is the SI unit of resistivity?**

**Ans:** SI unit of resistivity is ohm-metre ( $\Omega\text{m}$ )

7. **What is the SI unit of conductivity?**

**Ans:** SI unit of conductivity is mho per metre ( $\Omega^{-1}\text{m}^{-1}$ )

8. **What are the factors on which resistivity of a conductor depend?**

**Ans:** Resistivity depends on nature of the conductor and temperature.

9. **How does resistivity of a wire depends on its temperature?**

## VIVA-VOCE FOR II PUC PRACTICAL EXAMINATION IN PHYSICS

**Ans:** Resistivity is directly proportional to temperature ( $\rho \propto t$ ) or it increases with increase in temperature.

**10. What is a cell?**

**Ans:** It is a device used to maintain current in a circuit.

**11. What is meant by emf of a cell?**

**Ans:** It is the work done by the cell to drive a unit positive charge once round a closed circuit.

**12. What is Laclanche cell?**

**Ans:** It is a primary cell (cannot be recharged) and contains carbon rod as +ve electrode and zinc rod as -ve electrode with ammonium chloride ( $\text{NH}_4\text{Cl}$ ) as electrolyte.  $E=1.5 \text{ V}$ .

**13. What is Daniel cell?**

**Ans:** It is a primary cell (cannot be recharged) and has copper container containing  $\text{CuSO}_4$  solution as +ve electrode and zinc rod in dilute  $\text{H}_2\text{SO}_4$  as -ve electrode with copper sulphate ( $\text{CuSO}_4$ ) as electrolyte.  $E=1.08 \text{ V}$

**14. What is potential difference?**

**Ans:** It is the product of resistance and current ( $V = IR$ )

**15. What is potential gradient?**

**Ans:** It is the rate of change of potential with distance.

### EXPT NO. 3: FIGURE OF MERIT OF GALVANOMETER

**1. What is galvanometer?**

**Ans:** It is a device used to detect current and its direction in circuit.

**2. What is the figure of merit of galvanometer?**

**Ans:** It is the current required to produce a deflection of one division in galvanometer. ( $K=I/\theta$ )

**3. What is half deflection method?**

**Ans:** It is a method employed in the experiment to determine galvanometer resistance ( $G$ ) in the circuit.

**4. What is emf of a cell?**

**Ans:** It is the work done by the cell to drive a unit positive charge once round a closed circuit.

**5. What is the principle of working of galvanometer?**

**Ans:** It works on the principle of mechanical effect of electric current.

**6. What is a standard resistance box?**

**Ans:** It is used to offer known value of resistance in a circuit.

**7. Why a galvanometer has resistance?**

**Ans:** It is due to the opposition offered by its coil.

**8. What is the unit of figure of merit of galvanometer?**

**Ans:** ampere per division ( $\text{A div}^{-1}$ ).

**9. What are the uses of figure of merit of galvanometer?**

**Ans:** It helps to calculate the resistance required to convert galvanometer into ammeter or voltmeter.

### EXPT NO. 4: AMMETER (GALVANOMETER INTO AMMETER)

**1. What is an ammeter?**

**Ans:** It is a device used to measure current in a circuit.

**2. Why is an ammeter is used in series in a circuit?**

**Ans:** The whole current is to be measured is passed through it.

**3. How an ammeter is constructed?**

**Ans:** An ammeter is constructed by connecting a low resistance in parallel with a galvanometer.

**4. What is a shunt?**

**Ans:** It is a low resistance connected in parallel with a galvanometer to convert it in to an ammeter.

**5. What is an ideal ammeter?**

**Ans:** It is an ammeter having zero resistance.

**6. Why an ammeter is always connected in series with the circuit?**

**Ans:** It is because the whole current in the circuit should pass through ammeter.

**7. How does the range of an ammeter depend on its shunt resistance?**

**Ans:** The range of an ammeter is inversely proportional to its shunt resistance ( $I \propto 1/S$ ).

**8. What is the difference between a galvanometer and an ammeter?**

**Ans:** A galvanometer has moderate resistance and an ammeter has low resistance.

**9. Can you convert ammeter to voltmeter and vice versa?**

**Ans.** Converting an ammeter to a voltmeter involves increasing the resistance of the ammeter. This is done by adding a high resistance in series with the ammeter.

**10. Define current sensitivity.**

**Ans.** The deflection induced in the coil of the galvanometer per unit passage of electric current through it is known as current sensitivity.

**11. Why a shunt resistance is connected in parallel to galvanometer?**

**Ans.** When it is connected in parallel to the galvanometer it keeps the resistance low, which can be used to measure the current strength in the circuit.

**12. Define current sensitivity?**

**Ans:** The deflection per unit current.

#### **EXPT NO. 5: VOLTMETER (GALVANOMETER INTO VOLTMETER)**

**1. What is voltmeter?**

**Ans:** It is a device used to measure potential difference across a component of a circuit.

**2. How do you convert galvanometer to voltmeter ?**

**Ans:** It is constructed by connecting a high resistance in series with galvanometer.

**3. What is resistance of an ideal voltmeter?**

**Ans:** It is a voltmeter having infinite resistance.

**4. Why a voltmeter is always connected across two points in a circuit?**

**Ans:** It is because it has to measure potential difference between two points in a circuit.

**5. How does the range of a voltmeter depend on its resistance?**

**Ans:** The range of a voltmeter is directly proportional to its resistance.

**6. Why voltmeter is always connected in parallel in any circuit?**

**Ans:** A Voltmeter has very high resistance to ensure that its connection do not alter flow of current in the circuit. Now if it is connected in series then no current will be there in the circuit due to its high resistance. Hence it is connected in parallel to the load across which potential difference is to be measured.

**7. What is a moving coil galvanometer?**

**Ans:** It is an instrument which is used to measure electric currents.

**8. Why galvanometer cannot be used to measure the current?**

**Ans:** it is a very sensitive instrument as it shows full scale deflection even for a very small current.

**9. Define voltage sensitivity?**

**Ans:** The deflection per unit voltage.

#### **EXPT NO. 6: FREQUENCY OF AC**

**1. What is meant by frequency of AC?**

**Ans:** it is the number of cycles completed by the AC in one second.

**2. Which type of waves is produced in the sonometer wire?**

**Ans:** Transverse stationary waves are produced in the sonometer wire.

**3. Which parameter changes when the distance between the knife edges is varied?**

**Ans:** The natural frequency of the sonometer wire changes.

**4. When will the sonometer wire resonate?**

**Ans:** When the frequency of AC mains is equal to the natural frequency of the vibration of the wire.

**5. How does the resonating length of the wire vary with the tension in the string?**

**Ans:** Resonating length increases with the tension in the sonometer wire (string).

**6. What is the value of frequency of DC?**

**Ans:** The frequency of DC is zero.

**7. What is a sonometer?**

**Answer:** A sonometer is a device to showcase the relationship between the frequency of the sound produced by the string when it is plucked and the length, tension, and mass per unit length of the string.

**8. What is Alternating Current (AC)?**

**Answer:** Alternating Current is a current that changes its magnitude and polarity at regular intervals of time.

**9. What is a Direct Current (DC)?**

**Answer:** Direct current is the unidirectional flow of an electric charge.

**Example:** The mobile battery gives DC.

**10. List two uses of a sonometer.**

**Answer:** Sonometer is used to find the frequency of the tuning fork. It is also used to find the tension in the string.

**11. Can the frequency of the alternating current be found using the sonometer?**

**Answer:** Yes, the alternating current frequency can be found using the sonometer.

**12. What is the unit of frequency of an alternating current?**

**Answer:** The unit of frequency of the alternating current is hertz (Hz).

**13. Define an electromagnet.**

**Answer:** A magnet that can be magnetized through electric current is known as an electromagnet.

**14. Define a tuning fork.**

**Answer:** A tuning fork is a U-shaped metallic bar where the middle of the bent portion is attached to the heavy steps.

**15. How is a direct current different from an alternating current?**

**Answer:** Alternating current changes its magnitude and direction, while the direct current has the same magnitude and direction throughout.

### EXPT NO. 7: FOCAL LENGTH OF A CONCAVE MIRROR

**1. What is a concave mirror?**

**Ans:** A spherical mirror whose reflecting surface is towards the centre of the sphere of which the mirror is a part is called **concave mirror**.

**2. Define focal length of a concave mirror.**

**Ans:** It is the distance between the pole and the principle focus of a concave mirror.

**3. What is the relation between the focal length of a mirror and its radius of curvature?**

**Ans:** The focal length of a mirror is equal to half of its radius of curvature i.e.,  $f = \frac{R}{2}$ .

**4. What is the nature of the image formed by a concave mirror when an object is kept between F and 2F?**

**Ans:** The image formed by a concave mirror is real and inverted.

**5. When does a concave mirror produce a virtual image?**

**Ans:** When the object is placed between the pole (P) and principle focus(F) of the mirror.

**6. Concave mirror is used as shaving mirror, Why?**

**Ans:** When face lies between principle focus and pole of concave mirror, an erected enlarged face is formed.

**7. Define the terms pole, centre of curvature of a mirror, radius of curvature, principal axis, aperture of mirror.**

**Ans: Pole:** The spherical mirror's centre.

**centre of curvature of a mirror:** it is the centre of the sphere of which the mirror forms a part.

**radius of Curvature:** This is the radius of the hollow glass sphere in which a mirror is contained.

**Principal axis:** This is the straight line that runs from the spherical mirror's pole to the centre of curvature.

**Aperture:** The part of a mirror where light is reflected.

**8. Define mirror.**

**Ans:** It is an object that reflects an image.

**9. Define concave mirror.**

**Ans:** A concave mirror is a curved mirror where the reflecting surface is on the inner side of the curved shape.

**10. Define object distance and image distance.**

**Object distance:** It is the distance between the object placed and the incidence point.

**Image distance:** It is the distance to the center line of the lens of an image.

**Focal length:** It is the one-half of mirror radius of curvature.

**11. Define real image and virtual image.**

**Ans:** A real image is formed by the actual intersection of light rays whereas a virtual image is formed by the imaginary intersection of light rays. A real image can be formed in a screen but a virtual image can be only seen in the mirror.

**12. What is the nature of image formed by concave mirror?**

Concave mirrors form both real and virtual images. When the concave mirror is placed very close to the object, a virtual and magnified image is obtained, and if we increase the distance between the object and the mirror, the size of the image reduces and real images are formed.

**EXPT NO. 8: FOCAL LENGTH OF A CONVEX LENS**

**1. What is a convex lens?**

**Ans:** A lens which is thick in the middle and thin at the edges is called a convex lens.

**2. Define focal length of a convex lens.**

**Ans:** It is the distance between the optic centre of a convex lens and its principle focus.

**3. Can a convex lens be used as a magnifier?**

**Ans:** Yes, when an object is placed between the pole and the principle focus (i.e.,  $U < f$ ), the image is virtual, erect and enlarged, hence it can be used as a magnifier.

**4. Define principle focus of a convex lens.**

**Ans:** it is a principle focus of a convex lens at which all the rays converges after refraction.

**5. Why the object must be placed between f and 2f of a convex lense?**

**Ans:** To have a real, enlarged and inverted image.

**6. Which convex lens has more focal length, thick lens or thin lens?**

**Ans:** A thin convex lens

**7. Give the difference between mirror and lens?**

**Ans:** Lens is transparent and it produces the Images by refraction. Mirror is the glass surface and the back side of the Mirror is a silvery backing which helps to form an Image due to reflection.

**8. On what factors does the focal length of lens depends?**

**Ans:** Focal length depends on the radius of curvature, the refractive index of lens material, and the medium's refractive index in which the lens is placed.

**9. What type of image is formed by convex lens?**

**Ans:** A convex lens forms a virtual image of an object kept between the focus (F1) and the optical centre of the lens. Hence, it can form both real and virtual images based on the object's position. A virtual, erect and magnified image can be formed only by a convex lens.

**10. What type of lens is used in magnifying glass?**

**Ans:** convex lens

**11. What is power of a lens?**

**Ans:** The reciprocal of its focal length.

**12. Why convex lens is used in telescope or microscope, why not concave?**

**Ans:** Convex lens is used in refracting telescope. The convex lens focuses the light that is coming from the object which is at a large distance. And different convex lenses magnify the image so a large image is produced.

**13. What is the difference between lens and prism?**

**Ans:** The prism causes dispersion of the light rays which means it divides the white light into seven basic colours of VIBGYOR spectrum range. The lens (both diverging and converging) causes refraction of the light rays which falls upon one surface of the lens.

**14. What is magnification?**

**Ans:** Magnification of the lens is basically the ratio of the linear size of the image to the linear size of the object.  $m = (\text{linear size of the image}/\text{linear size of the object})$

**15. What is a convex lens?**

**Ans:** A lens that is curved outwards is known as a convex lens. Convex lenses are also known as converging lenses. The thickness at the centre of a convex lens is more than its edge. A convex lens has the capability to converge a parallel beam of light into a point.

**16. What is a concave lens?**

**Ans:** The type of lens with at least one side curved inwards is known as a concave lens. A Biconcave lens is a concave lens with both sides curved inward. Concave lenses are also known as diverging lenses because they spread out or diverge the rays of light that are refracted through it.

**17. Define the power of a lens?**

**Ans:** The measure of the ability of a lens to converge or diverge the incident beam of light is known as the power of a lens. It is given by the reciprocal of focal length.

**18. Define refraction.**

**Ans:** Refraction is basically the bending of light when it passes from one medium to another. Several devices, like microscopes, corrective lenses, magnifying lenses etc., use this property of refraction. In this property, the polarisation of electrons takes place when the light is transmitted through a medium, which in turn decreases the speed of light; therefore, the direction of light changes.

**19. What is total internal reflection?**

**Ans:** When the light rays travel from a more optically denser medium to a less optically denser medium, the phenomenon that happens is known as total internal reflection.

### EXPT NO. 9: ANGLE OF MINIMUM DEVIATION

**1. What is a prism?**

**Ans:** it is an optical medium bounded by at least two non-parallel surfaces.

(OR)

A prism is a transparent optical device with polished, flat surfaces that refract light. At least one of its surfaces must be angled. A similar optical device with two parallel sides is not a prism.

Define angle of the prism.

**Ans:** The angle between the two refracting surfaces of a prism is called angle of the prism.

**2. Define angle of minimum deviation.**

**Ans:** The least value of deviation for a ray passing through a prism is called angle of minimum deviation.

**3. When does minimum deviation occur?**

**Ans:** When the angle of incidence is equal to the angle of emergence.

**4. What does the graph of angle of incidence (i) angle of deviation (d) indicates?**

**Ans:** The d-i graph indicates that there is one value of angle of incidence for which the angle of deviation is minimum.

**5. Is the angle of minimum deviation same for all the colours of light?**

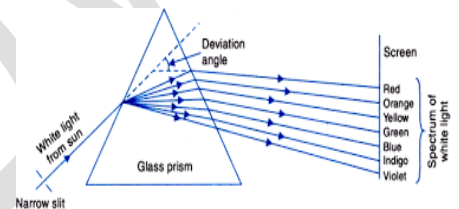
**Ans:** No, it is different for different colours.

**6. What is dispersion of light?**

**Ans:** The process of splitting of white light into seven colours is called dispersion of light.

**7. What is the cause for dispersion of light?**

**Ans:** When white light passes through a glass prism, its constituent colours (red, orange, yellow, green, blue, indigo, violet) travel with different speeds in the prism because refractive index is color dependent. This causes the dispersion of light.



**8. Name the consequences of dispersion.**

**Ans:** The most commonly seen consequence of dispersion in optics is the separation of white light into a color spectrum by a prism. From Snell's law it can be seen that the angle of refraction of light in a prism depends on the refractive index of the prism material.

**9. Name the most deviated color in the spectrum of light.**

**Ans:** Violet

**10. Does the angle of minimum deviation depend upon the color of light?**

**Ans:** Yes, it depends on colour of the light used.

**11. What are the materials required for this experiment?**

**Ans:** The materials required for this experiment are a drawing board, a white sheet of paper, a prism, drawing pins, a pencil, a half-metre scale, office pins, a protractor, and graph paper.

**12. What is the theory behind this experiment?**

**Ans:** Refraction happens when a light ray moves through two adjacent mediums with different refractive indices or densities. These results in the deviation of the emergent light ray compared to the incident light ray.

**13. How many edges are there in a prism?**

**Ans:** There are nine edges in a prism.

**14. What is meant by the angle of deviation?**

**Ans:** The angle of deviation is the angle at which a light ray turns away from the original way while moving through a prism.

**15. What are the factors that control the angle of deviation?**

**Ans:** It depends on,

The angle of incidence

The material of the prism.

The refracting angle (prism).

The wavelength of the light used (colour).

**16. What is meant by the dispersion of light?**

**Ans:** The process of splitting pure white light into its seven constituent colours is known as the dispersion of light.

**17. What is the conclusion of the graph of 'i' and 'D'?**

**Ans:** The deviation is minimum only at one special value of incidence angle.

**18. Why are there dual values of incidence angle for one particular value of deviation angle?**

**Ans:** In the case where an emergent light ray is reversed, then the angle  $i$  changes to  $e$  and the angle  $e$  changes to  $i$ . The reversed light ray will possess the exact deviation as before.

**19. Does a ray of white light produce a spectrum on travelling through a hollow prism?**

**Ans:** No, dispersion does not happen in the air. For the generation of the ideal spectrum, light needs a perfect prism.

**20. Which colour deviates the least?**

**Ans:** Red colour deviates the least.

**21. Which colour deviates the most?**

**Ans:** Violet colour deviates the most.

**22. Which colour possesses the highest refractive index?**

**Ans:** Violet colour has the highest refractive index.

**23. Which colour has the lowest refractive index?**

**Ans:** Red colour possesses the lowest refractive index.

**24. What is the dispersive power of a prism?**

**Ans:** A prism's dispersive power is the ratio of the angular dispersion for the given two colours to the average deviation generated by the prism.

**25. What is the factor that controls dispersive power?**

**Ans:** Dispersive power depends on the refractive index of the prism's material.

**EXPT NO. 10: Refractive index of glass**

**1. Define absolute refractive index.**

**Ans:** it is defined as the ratio of velocity of light in vacuum to that in a given medium.

**2. What is meant by least count of travelling microscope?**

**Ans:** The least measurement that can be done in travelling microscope is called its least count.

**3. What is normal shift?**

**Ans:** it is the difference between actual depth and apparent depth.

**4. What is the cause of normal shift?**

**Ans:** It is due to refraction of light.

**5. Is refractive index of glass slab depends on its thickness?**

**Ans:** The refractive index of a glass slab does not depend on its thickness.

**6. What do you mean by refraction of light?**

**Ans:** Refraction of light is the change in the direction of light as it passes from one medium to another.

**7. Which of the following does not change during refraction of light? Wave length, frequency.**

**Ans:** Frequency of light does not change on refraction, When a ray of light passes from one medium to another, its direction (or path) changes because of change in speed of light from one medium to another.

**8. Define Snell's law.**



**Ans:** Snell's law is defined as “The ratio of the sine of the angle of incidence to the sine of the angle of refraction is a constant, for the light of a given colour and for the given pair of media”.

**9. Define refractive index of material.**

**Ans:** The ratio of the velocity of a light ray in an empty space to the velocity of light in a substance,  $n = c/v$ .

**10. What is the difference between ordinary microscope and travelling microscope?**

**Ans:** Just like the configuration of a normal microscope, a traveling microscope has an objective and an eyepiece. But the whole body tube in this type of microscope is mounted on a vernier scale which is capable of measuring very tiny distances and is extremely accurate.

### EXPT NO. 11: REFRACTIVE INDEX OF LIQUID

**1. Define refractive index of a medium.**

**Ans:** The ratio of the velocity of light in vacuum to the velocity of light in a medium is called refractive index of the medium

**2. Name the liquid lens formed between plane mirror and glass convex lens.**

**Ans:** Liquid plano-concave lens.

**3. What is the value of radius of curvature of the bottom surface of the liquid lens.**

**Ans:** Radius of curvature is infinity.

**4. Which optical medium has least refractive index, water or glass?**

**Ans:** water

**5. Is the refractive index of water depends on the focal length of convex lens?**

**Ans:** No, it is independent of focal length of convex lens

**6. Name the types of lenses of the combination in this experiment.**

**Ans:** convex lens and plano concave lens.

**7. What is convex lens?**

**Ans:** A lens which converge parallel beam of light passing through it is called converging lens or convex lens.

**8. What is refraction?**

**Ans:** The change in direction of a ray of light when it travels from one medium to another is called refraction.

**9. State Snell's law.**

**Ans:** The ratio of the sine of the angle of incidence to the sine of angle of refraction is a constant for a given pair of media and for a given colour of light.

**10. What is radius of curvature?**

**Ans:** The radius of the sphere of which the mirror or lens is a part is called radius of curvature.

**11. Which property of light ray does not change in refraction?**

**Ans:** Frequency of light ray remains the same during refraction.

**12. What happens when the light ray travels from a rarer medium to a denser medium?**

**Answer:** When the light ray travels from a rarer medium to a denser medium, it bends at the interface of the two mediums and again travels in a straight line.

**13. What is refraction?**

**Answer:** Refraction of light is a phenomenon where the light ray travelling from a lighter medium to a denser medium bends at the interface of two mediums.

**14. What is the formula for finding the refractive index with respect to the medium and air?**

**Answer:** The formula is:  $n = \frac{\text{real thickness of the slab}}{\text{apparent thickness of the slab}}$

**15. State true or false: The refractive index is dimensionless.**

**Answer:** True. The refractive index is a dimensionless quantity.

16. **What is the speed of light in a vacuum?**

**Answer:** The speed of light in a vacuum is  $3 \times 10^8$  m/s.

17. **Which is the phenomenon that is responsible for the sunrise and sunset?**

**Answer:** Atmospheric refraction is the phenomenon that causes the sunrise and sunset.

18. **Define absolute refractive index.**

**Answer:** The ratio of the velocity of the light in the air to its velocity in a medium gives the absolute refractive index of the medium.

19. **What is a convex lens?**

**Answer:** A convex lens is thicker at the centre and thinner at the edges. This lens has the ability to converge a straight beam of light.

20. **What is the refractive index of the air?**

**Answer:** The refractive index of the air is 1.0003.

21. **What is the refractive index of glass?**

**Answer:** The refractive index of glass is 1.52.

22. **Does the refractive index vary with wavelength?**

**Answer:** Yes. The refractive index varies with wavelength.

23. **What is the formula to find the refractive index of medium 2 with respect to 1?**

**Answer:**  $n_1^2 = \frac{\text{Speed of light in medium 1}}{\text{Speed of light in medium 2}}$

24. **What is a prism? Speed of light in medium 2**

**Answer:** A prism is a transparent material surrounded by three rectangular surfaces forming a triangle.

25. **Why is the speed of light in water faster than the speed of light through glass?**

**Answer:** The speed of light in water is faster than the speed of light through glass because the refractive index of water is lesser than that of glass.

26. **What is the angle of the prism?**

**Answer:** Refracting angle of the prism or the angle of the prism is defined as the angle formed between the two refracting surfaces of the prism.

27. **What is the formula for finding the absolute refractive index of the medium?**

**Answer:** The absolute refractive index of the medium is given by the formula:  $n = \frac{c}{v}$

28. **Give the Snell's law formula.**

**Answer:** Snell's law is given by the formula:  $\frac{\sin i}{\sin r} = \text{constant} = \mu$

29. **What is the unit of the refractive index?**

**Answer:** The refractive index does not have a unit. It is dimensionless.

30. **What is optics?**

**Answer:** Optics is the branch of physics that deals with the behaviour and properties of light along with its interactions with matter.

### EXPT NO. 12: SEMICONDUCTOR DIODE

1. **What is a semiconductor diode?**

**Ans:** Semiconductor diode is a two terminal one junction device.

2. **How do you forward bias the junction diode?**

**Ans:** Junction diode is forward biased by connecting  $p$  region to positive and  $n$  region to negative terminal of the battery.

3. **What do you mean by junction potential difference in a  $pn$ -diode?**

**Ans:** It is the potential difference across the junction of the semiconductor diode when it is unbiased.

4. **What is Knee voltage?**

**Ans:** It is the voltage at which the current raises sharply in forward biased condition.

5. **How do you reverse bias the junction diode?**

**Ans:** Junction diode is reverse biased by connecting  $n$  region to positive and  $p$  region to negative terminal of the battery.

**6. What is break down voltage?**

**Ans:** It is the very high voltage at which the current raises sharply in reverse biased condition.

**7. Give three main precautions that should be taken while doing this experiment.**

**Ans:** The connections must be clean, right, and neat. A key must be used while the circuit is active. After the breakdown, voltage (forward bias) must not be provided.

**8. What are the three types of materials based on electrical conductivity?**

**Ans:** Conductors, insulators, and semiconductors are the three types of materials based on electrical conductivity.

**9. What is electrical conductivity?**

**Ans:** Electrical conductivity is a measure of how smoothly a body allows current to move through it.

**10. What is the relationship between resistivity and electrical conductivity?**

**Ans:** The electrical conductivity of the material is reciprocal to resistivity.

**11. What is a hole in the context of a semiconductor?**

**Ans:** A hole is a place in the crystal lattice of a material which is vacated by an electron. It is considered a positive charge.

**12. What is an intrinsic semiconductor?**

**Ans:** An intrinsic semiconductor is a pure semiconductor that does not possess any significant dopant species. It is also called an i-type semiconductor or undoped semiconductor.

**13. What is an extrinsic semiconductor?**

**Ans:** An extrinsic semiconductor is an impure semiconductor that possesses significant dopant species.

**14. What is an n-type semiconductor?**

**Ans:** An n-type semiconductor is a type of intrinsic semiconductor doped using arsenic (As), antimony (Sb) or phosphorus (P) as an impurity.

**15. What is meant by doping?**

**Ans:** Doping is the process of deliberately adding appropriate impurities to pure semiconductors.

**16. What is meant by a junction?**

**Ans:** A junction is a common surface of p-type and n-type semiconductors.

**17. What is meant by a junction potential barrier?**

**Ans:** A junction potential barrier is a potential difference between junction terminals of semiconductors.

**18. What are the two types of biasing?**

**Ans:** Forward biasing and reverse biasing are the two types of biasing.