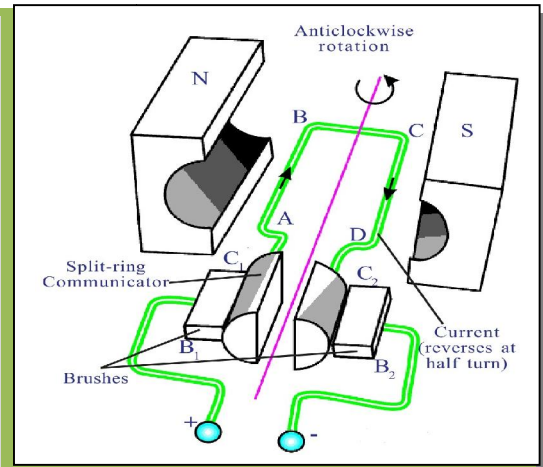


10th CLASS
ENGLISH MEDIUM
New Pattern



ACADEMIC STANDARD WISE
IMPORANT QUESTIONS



M.SRINIVASA RAO,SA(PS)
PH:9848143855
GUDIVADA

1.HEAT

½ Mark Questions

1. In an experiment regarding melting of ice, What happens to the temperature during the process?

Ans: Remains constant

2. Convert 20°C into Kelvin scale

Ans: 293K

3. Which phenomenon is involved in the formation of fog?

Ans: Condensation

4. During the winter season water droplets identified on the surface of leaves, grass, etc., What process is responsible for this ?

Ans: Condensation

5. Which one heat up fast, if the specific heat of earth is more than the specific heat of water in the sea?

Ans: Water in the sea

6. Raghava dropped ice cube in water. It float on water. Assume why the ice Cube float on water ?

Ans: The density of ice is less than of density of water

7. $-23^{\circ}\text{C} =$

A) 270K B) 250K C) 293K D) NONE

Ans: B

8. Which device you select to measure the specific heat of a solid in the laboratory?

Ans: Calorie meter

9. What is the value of latent heat of vaporization of water?

Ans: 540 cal/g

10. Which phenomenon is the reason behind the formation of dew on the surface of a cold soft drink bottle kept in open air?

Ans: Condensation

11. What happens to the energy of molecules of liquid during evaporation?

Ans: Decreases

12. Which of the following is true?

A) While condensation, the temperature of substance is increases

B) While freezing, the temperature of substance is increases

C) At boiling, the temperature of substance remains constant

D) All the above statements are true

Ans: A and C

13. If equal amount of spirit is kept in dish and cap. Which will evaporate faster?

Ans: Dish

14.

Substance	Copper	Ice	Water	Mercury	Sea water
Specific heat(cal/g- $^{\circ}\text{C}$)	0.09	0.5	1	0.033	0.95

Which substance can gain/loss heat energy quickly?

Ans: Mercury

15. If the temperature of a steel rod is 300K, then its temperature in $^{\circ}\text{C}$ is

Ans: 27°C

16. What is the value of latent heat of fusion of ice ?

Ans: 80 cal/g- $^{\circ}\text{C}$

17. Write the formula to find the specific heat of a substance

Ans: $s = \frac{Q}{m\Delta T}$

18. What is the effect of pressure on melting point of ice

Ans: If pressure is increases than melting point of ice is decreases

19. What is the S.I unit of specific heat?

Ans: J/kg-K

20. The heat energy supplied to a substance during melting is known as _____

Ans: Latent heat of fusion

21. What happens to absolute temperature of a body, when the average kinetic energy of the molecules of the body is doubled

Ans: Doubled

22. Write the relation between C.G.S unit of heat and S.I unit of heat

Ans: 1 cal = 4.186 J

23. If initial temperatures of the two samples of masses m_1 and m_2 be T_1 and T_2 , then what is the final temperature of the mixture (T) is

Ans: $T = \frac{m_1T_1 + m_2T_2}{m_1 + m_2}$

1 Mark Questions

1. Why does ice floats on water?

Ans: The density of ice is less than that of water

2. Take two bowls one with hot water and second with cold water. Gently sprinkle food colour on the surface of the water in both bowls and write down your observation?

Ans: We observed that the jiggling of the grains of food colour in hot water is more when compared to the jiggling in cold water (or) We observed that the grains in hot water move more rapidly than the grains in cold water.

3. State the principle of method of mixtures.

Ans: Net heat lost = Net heat gain

4. When two objects are said to be in thermal equilibrium?

Ans: When two objects of different temperatures are placed in thermal contact, heat energy will be transferred from the Hotter object to the colder object and both objects attain same degree of temperature

5. Distinguish between evaporation and condensation.

Ans:

Evaporation	Condensation
The phase change from liquid to gas at any temperature	The phase change from gas to liquid
Cooling process	Warming process

6. 1 g of ice at 0°C and 1 g of water at 40°C are mixed. What is resultant temperature ?

Ans: 0°C

(Explanation: 1g of ice at $0^{\circ}\text{C} \rightarrow$ 1g of water at 0°C (Q)=mL=1x80=80 cal

1g of water at $40^{\circ}\text{C} \rightarrow$ 1g of water at 0°C (Q)=ms Δ T=1x1x40=40cal

Heats are not equal, So some ice present in the mixer. Resultant temperature is 0°C)

7. Define Evaporation

Ans: The process of escaping of molecules from the surface of a liquid at any temperature is called "Evaporation"

8. Define Temperature

Ans: The degree of hotness or coldness of the object is known as temperature

9. What is Humidity? How does humidity forms in the atmosphere?

Ans: The amount of water vapour present in air is called humidity.

Humidity may come from evaporation of water from the surfaces of rivers, lakes, ponds and from the drying of wet clothes, sweat and so on.

10. Are the volumes of water and ice formed with same amount of water equal?

Ans: No, the volume of ice is greater than volume of water

11. Does the reverse process of evaporation take place? When and how does it take place?

Ans: Yes, Condensation

Heat is taken by the system and condensation takes place

12. What is latent heat of vaporization?

Ans: The heat energy required to change 1 gm of liquid to gas at constant temperature is called Latent heat of Vaporization

13. Pour a few drops of spirit on your palm. Why does your skin become colder?

Ans: Due to Evaporation. It is cooling process

14. Why does evaporation always produce cooling?

Ans: The temperature of a system falls during evaporation, So evaporation always produces cooling

15. Why does transfer of heat energy take place between objects (system) ?

Ans: To obtain thermal equilibrium

16. Define Latent heat of Fusion.

Ans: The heat energy required to convert 1 gm of solid completely into liquid at a constant temperature is called Latent heat of fusion

17. While drinking water, Ramesh spilled some water on the floor. After sometime, the water disappeared from the floor. What happened to the water?

Ans: Evaporation takes place

18. The specific heat of Lead, Mercury and water are different. Why it is (the specific heat) the different for different materials?

Ans: Specific heat of a substance depends on its nature.

2 Marks Questions

1.Explains why the temperature of hot water decreases when it is added to cold kerosene?

Ans: i)When two bodies of different temperatures are placed in thermal contact ,heat energy will be transferred from the hotter body to the colder body and both bodies attains same degree of temperature
ii) So heat transferred to hot water to kerosene. The temperature of hot water is decreases and temperature of kerosene is increases

2.Write any two differences between heat and temperature?

Ans:

Heat	Temperature
1.Heat is the energy that flows from a hotter body to a closer body	1.The degree of hotness or coldness of the object is known as temperature
2.It is denoted by 'Q'	2.It is denoted by 'T'
3.S.I unit is Joule	3. S.I unit is Kelvin
4. Vector quantity	4. Scalar Quantity

(Write any two differences)

3. How do you appreciate the role of water which is used in coolant in industries?

Ans: Water has high specific heat capacity. So Water is used as a coolant in industries. Water can absorb large amount of heat and machines temperatures are not raise.

4. If you are chilly outside the shower stall why do you feel warm after the bath if you stay in the bathroom?

Ans: i)The no.of water vapour molecules per unit volume in the bathroom is greater than the no.of vapour molecules per unit volume outside the bathroom
ii) When we try to dry ourselves with a towel, the vapour molecules surrounding us condense on our skin
iii)Condensation is a warming process,hence we feel warm

5.What is the final temperature of a mixture of a mixture of 50g of water at 20⁰C and 50g of water at 40⁰C?

Ans: . $m_1 = 50\text{g}$, $m_2 = 50\text{g}$, $T_1 = 20^{\circ}\text{C}$, $T_2 = 40^{\circ}\text{C}$.

$$T = \frac{m_1T_1 + m_2T_2}{m_1 + m_2} = \frac{50 \times 20 + 50 \times 40}{50 + 50} = \frac{1000 + 2000}{100} = \frac{3000}{100} = 30^{\circ}\text{C}$$

6.Temperature of two cities at different times are given as follows

Time/City	At 6 am	At 11.30 am	At 6 pm
A	-3 ⁰ C	300K	5 ⁰ C
B	271K	27 ⁰ C	270K

a) In which city the morning temperature at 6 am relatively high?

b) At what time to both cities are having the equal temperature?

Ans: a) city B

b) At 11.30am

7.Your friend is asked the differentiate between evaporation and boiling. What questions could you ask to make him to know the difference between evaporation and boiling?

Ans: . a) What is meant by evaporation?

b)What is meant by boiling?

c)At what temperature evaporation takes place?

d) At what temperature boiling takes place?

e)Which one is the Cooling process?

f)Which one is the Warming process?

g) In which process, energy of the system increases?

h) In which process, energy of the system decreases?

(Write any two relevant questions?)

8.Specific heat values of different substances are given under

Substance	Specific heat(J/kg-K)
Lead	130
Brass	380
Copper	399
Iron	483
Aluminium	882

Based on the table answer the questions

i) Same quantity of water is taken in two vessels made with Copper and Aluminium and same quantity of heat is supplied. In which water gain more heat?

ii) What is the CGS unit of specific heat?

- Ans:** i) Water in Copper vessel
ii) $\text{cal/g-}^{\circ}\text{C}$

9. How do you appreciate the specific heat capacity of water playing an important role in our daily life?

- Ans:** i) Oceans can absorb large amounts of heat at the equator without appreciable rise in temperature, maintaining a relatively constant temperature and stabilizing atmosphere temperature during winter and summer seasons.
ii) Water is used as coolant in automobile engines.

10. Explain why dogs pant during hot summer days using the concept of evaporation?

- Ans:** i) Dogs pant during hot summer days and get their body cooled. This cooling effect is due to evaporation.
ii) Evaporation is a surface phenomenon.
iii) Dogs don't have sweat glands. Their body is covered with hair. They have sweat glands only in the feet.
iv) So by panting the water on the tongue evaporates resulting in the cooling of the dogs body.

11. What happens to the water when wet cloths dry

- Ans:** Water from the wet clothes evaporates when wet clothes dry and mixes with air in the surroundings.

12. Why do we get dew on the surface of a cold soft drink bottle kept in open air

- Ans:** The temperature of surrounding air is higher than the temperature of the cold soft drink. Air contains water molecules in the form of vapour. When the molecules of water in air, during their motion, strike the surface of cold soft drink bottle which is cool, then the molecules of air lose their kinetic energy which leads to lower the temperature and they get converted into droplets.

13. Your friend is asked to differentiate between Dew and Fog. What questions could you ask to make him to know the differentiate between Dew and Fog?

- Ans:** a) What is Dew and What is Fog?
b) Which phenomenon is first occurred?
c) Thick mist is called as?

14. During winters, we will observe droplets of water in the cricket field, leaves and grass. How are these droplets formed?

- Ans:** During winter nights, the atmospheric temperature goes down. The air near them becomes saturated with vapour and condensation begins. The water droplets condensed on cricket field, leaves and grass.

4 Marks Questions

1. How much energy is released or absorbed when 10g of steam at 100°C turns to ice at 0°C ?

2. Explain the procedure of finding specific heat of solid experimentally (or) Explain the procedure of finding the specific heat of a solid experiment by principles of methods of mixture ?

3. Hari wants to find the specific heat of lead shots and Aluminium bolt in the laboratory.

- a) What are the materials required in his laboratory?
b) Which law/principle used in the experiment?
c) Mention the precautions taken in this experiment.
d) What do you observe in this experiment.

4. Write the factors that effect the process of evaporation? Explain with suitable examples. (or) Explain on which factors evaporation depends? (or) Suggest an experiment to prove that the rate of evaporation of a liquid depends on its surface area and vapour already present in surrounding air?

5. Explain the following terms a) Latent heat of vaporization b) Latent heat of fusion

6. X, Y and Z are three different substances having specific heat as 0.093, 0.033 and $0.21 \text{ cal/g-}^{\circ}\text{C}$ respectively.

Answer the following questions

- a) Convert specific heat of a substance Y into SI units
b) Calculate how much heat required when 200g of X heated from 30°C to 80°C
c) The substance Z is having more specific heat then other the substances, write the nature of the substances.

7. Draw a neat diagram of arrangement of apparatus to show the specific heat of different substances ?

8. Explain the terms (i) Evaporation (ii) Condensation

9. Calculate the required heat energy to change 12grams of ice at -10°C into water vapour at 100°C

10. Write the differences between evaporation and boiling

11. The rate of rise in temperature depends on the nature of the substance. Prove it with an activity

12. Suggest an experiment to prove that the rate of evaporation of a liquid depends on its surface area and vapour already present in surrounding medium.

3. Refraction of Light at Plane Surfaces

½ Mark Questions

1. Can a virtual image be photographed by a camera?

Ans: Yes

2. A light ray passes from denser medium to rarer medium. If the angle of incidence is equal to critical angle, then what is the angle of refraction?

Ans: 90°

3. What phenomena of light is responsible for disappearance of coin placed bottom of transparent glass filled with water?

Ans: Refraction

4. What phenomena of light takes place in optical fibres? (or) Name the phenomenon involved in the function of optical fibre (or) Optical Fibre Cable (OFC) are often used in tele-communications. What is the working principle behind OFC (or) What is the basic principle of endoscope?

Ans: Total internal reflection

5. A teacher asked questions to a student he/she said c/v a constant. Guess the question asked by the teacher?

Ans: What is the formula of Refractive index?

What is the constant?

(Write any relevant question)

6. What is value of angle of refraction at critical angle of incidence?

Ans: 90°

7. The correct order of the speed of light in the given substance?

a) Air <kerosene<benzene b)benzene<kerosene<air c)kerosene>air>benzene d)air>benzene>kerosene

Ans: b

8. ASSERTION : It is difficult to shoot a fish swimming in water .

REASON : Due to refraction fish in water change its original position.

A) A –TRUE,R-FALSE B) A –FALSE,R-TRUE C) A –FALSE,R-FALSE D) A –TRUE,R-TRUE

Ans: D

9. Which phenomenon is involved in twinkling of stars?

Ans: Multiple refraction

10. Choose the suitable answers of Section B with Section A

Section A

1. Formula for Snell's Law

2. At critical angle, the angle of refraction

Section B

P) $n_2/n_1 = \sin r / \sin i$

Q) $n_1/n_2 = \sin r / \sin i$

R) 90°

S) 60°

Ans: 1-Q, 2-R

11. Write Snell's law?

Ans: $n_1 \sin i = n_2 \sin r$ (or) $\sin i / \sin r = \text{constant}$

12. What do we call the phenomenon of the light occur when the angle of incidence is more than the critical angle C?

Ans: Total internal reflection

13. Mirage is an example of which phenomenon?

Ans: Total internal reflection

14. Choose the suitable answers of section-B with section-A

Section-A

1. Formula for refractive index

2. Possible values of refractive index

Section-B

P) V/C

Q) C/V

R) >1

S) <1

Ans: 1-Q, 2-R

15. When a light ray travel from denser to rarer medium along with the normal

a) It bends towards the normal b) It moves away from the normal c) It is an undeviated

Ans: c

16. What is the SI unit of refractive index?

A) m/s B) m/s^2 C) kg-m/s D) No unit

Ans: D

17. What process involved, when the image of the coin visible on the surface of the water in transaction vessel,

placing the coin at the bottom of the vessel

Ans: Refraction

18. You are given kerosene, ice and water. In which of these does the light travel faster?

Ans: Ice

19. Choose the suitable answer of section-B with section-A

Section-A	Section-B
i) Water	a) 2.42
ii) Diamond	b) 1.50
	c) 1.33

Ans: i-c, 2-a

20. The refractive index of glass respect to air is 2. Then the critical angle of glass air interface is

- A) 0° B) 45° C) 30° D) 60°

Ans: C

21. Saketh is doing an experiment with glass slab. He focused a laser light towards the glass slab at an angle 45° . What would be the angle of emergence?

Ans: 45° .

22. The most and least values pair of refractive index having substances among the following is

- A) Vacuum, Water B) Water, Vacuum C) Vacuum, Diamond D) Diamond, Vacuum

Ans: D

23. Write the value of the speed of light in vacuum

Ans: 3×10^8 m/s

24. Assertion(A): The speed of light in water is greater than that of benzene.

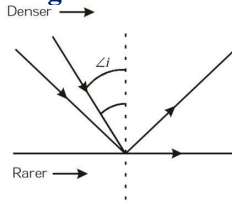
Reason(R): The speed of light in a medium is high when refractive index of the medium is low.

Which of the following is correct ?

- A) A and R are true and R supports A B) A and R are true but R does not support A
C) A is true but R is false D) A is false but R is true

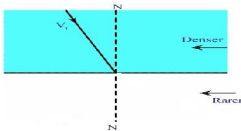
Ans: A

25. Which phenomenon do you observe from the figure?

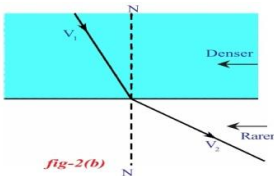


Ans: Total internal reflection

26. Complete the ray-diagram if a light ray passes from Denser to rarer medium



Ans:



1 Mark Questions

1. Why is it difficult to shoot a fish swimming in water ?

Ans: Due to refraction, the actual position of the fish is change. Fish and Observer are in two different mediums. The light ray travel from denser medium to rarer medium
(write any relevant answer)

2. Why do stars appear twinkling? (or) What is the reason for twinkling of stars

Ans: Stars appear twinkling due to multiple refractions of light through different atmospheric layers with different refractive indices.

3. Refractive index of a material is $3/2$. What is the speed of light in that material ? (or) The refractive index of glass is 1.5 then when is the speed of light in glass

Ans : Given $n=3/2$ $c=3 \times 10^8$ m/s
 $v = \frac{c}{n} = 3 \times 10^8 \times 2/3 = 2 \times 10^8$ m/s

4. What is the formula of refractive index of glass slab,if its vertical shift is known?

Ans : *Refractive index of glass slab* = $\frac{\text{Thickness of the slab}}{\text{thickness of slab} - \text{vertical shift}}$

5. Define Total Internal Reflection ?

Ans: When the angle of incidence is greater than critical angle, the light ray reflected into denser medium at interface. This phenomenon is called total internal reflection.

6. The refractive index of diamond is 2.42. What is the meaning of this statement?

Ans: The speed of light is low in diamond

7. On what factors does the refractive index of medium depend? (or) What are the factors that influence the refractive index

Ans: The speed of light is low in diamond

8. Which has a higher refractive index, glass or water? Why?

Ans: Glass. Speed of light is low in glass

9. Define refraction?

Ans: The process of changing speed at an interface when light travels from one medium to another is called refraction

10. A small empty borosil test tube is immersed in big borosil test tube having water. Gauss your answer when we see them from outerview?

Ans: Small empty borosil test tube appeared as shiny

11. In refraction of light, write the purpose of using the following apparatus.

Metal disk, protractor, straws, transparent vessel tube with water

Ans: The light ray travels from denser to rarer, it bends away from the normal and $r > i$

12. Define "Refractive index"

Ans: The ratio of speed of light in vacuum to the speed of light in that medium is defined as refractive index

13. What are the conditions required for total internal reflection

Ans: 1) Light must travel from denser medium to rarer medium

2) The angle of incidence in the denser medium must be greater than the critical angle for the two media

14. Why does ray of light bent when it travels from one medium to another

Ans: Changing speed of the light at an interface

15. Take a bright metal ball and make it black with soot in a candle flame, immerse it in water. How does it appears? Why?

Ans: Silver colour (shiny), because total internal reflection takes place

16. Refractive index of glass relative to water is 9/8. What is the refractive index of water relative to glass?

Ans: Given $n_{gw} = 9/8$

$$n_{wg} = 1/n_{gw} = \frac{1}{9/8} = \frac{8}{9}$$

16. Define Critical angle

Ans: The angle of incidence at which the light ray propagates from denser to rarer graze along interface is called critical angle

17. Refractive index of glass relative to water is 9/8. What is the refractive index of water relative to glass?

Ans: Given $n_{gw} = 9/8$

$$n_{wg} = 1/n_{gw} = 8/9$$

18. Among objects made of glass and diamond, which one shines more. Why?

Ans: Diamond shines more because of lower critical angle of 24.4°

2 Marks Questions

1. Write the laws of refraction?

Ans: 1) The incident ray, the refracted ray and the normal to interface of two transparent media at the point of incidence all lie in the same plane.

2) During refraction light follows Snell's law

$$n_1 \sin i = n_2 \sin r$$

2. Frame some questions to know about the formation of mirage.

Ans : 1) What is mirage?

2) Can you take a photo of a mirage?

3) Why should you see a mirage as a flowing water?

4) Which phenomenon is involved in formation of mirages?

5) What is condition to form mirage?

(Write any two relevant questions)

3. Prepare a report about various uses of optical fibres in our daily life.

Ans: a) Optical fibres are used in endoscopy

b) Optical fibres are used in transmit communication signals

4. What is the reason behind the shining of diamonds and how do you appreciate it ?

Ans: Total internal reflection is the main reason for brilliance of diamonds. The critical angle of a diamond is very low (24.4°). So if a light ray enters a diamond it is very likely to undergo total internal reflection which makes the diamond shine

5. Observe the table. Answer the following questions

Material medium	Water	Benzene	Turpentine oil	Kerosene
Refractive index	1.33	1.50	1.47	1.44

i. Which of the above material media, speed of light is less?

ii. Among water and kerosene, which is optically denser?

Ans: i) Benzene

ii) Kerosene

6. During a hot summer day your school student of lower class, observed that water has collected on road at a distant place, but when he get there he don't find any water. Then some doubts risen in his mind. Predict those doubts and frame two questions regarding this phenomenon.(or) Ravi observed water at a distance on the road in a summer mid day. He went there and found no water is there. He got many doubts in his mind. What would be those doubts?

Ans: i) Do you know the reason why it appears so?

ii) Which phenomenon is involved ?

iii) Why, we observed water on the road in summer days?

iv) Can you take a photo of this phenomenon?

(Write any two relevant questions)

7. Give any two daily life examples for refraction of light?

Ans: i) A coin placed in a glass of vessel filled with water appears to be raised

ii) A lemon kept in a glass of water appears to be bigger than size

iii) A pencil or stick appear to be bent when placed in a glass of water

iv) When a thick glass slab is placed over some printed letters, the letters appear raised when viewed through glass slab

(Write any two relevant examples)

8. Determine the refractive index of benzene if the critical angle of it is 42°

Ans: Given $C=42^\circ$

$$n = 1/\sin C = 1/\sin 42^\circ = 1/0.6691 = 1.49$$

9. Write the applications of total internal reflection

Ans: Brilliance of diamond, optical fibres, formation of mirages etc

10. When we sit at camp fire, objects beyond the fire are seen swaying. Give the reason for it.

Ans: i) This happens due to refraction of light when it passes through hot to cold air.

ii) So, we observe the objects behind the fire seen swaying.

11. Bhagavathi conduct an experiment of vertical shift of glass slab, her find the values of thickness and vertical shift of glass slab are 3cm and 1cm respectively. What is the refractive index of glass slab

Ans: Given thickness = 3 cm, vertical shift = 1 cm

$$\begin{aligned} \text{Refractive index of glass slab} &= \frac{\text{Thickness of the slab}}{\text{thickness of slab} - \text{vertical shift}} \\ &= \frac{3}{3-1} = \frac{3}{2} = 1.5 \end{aligned}$$

4 Marks Questions

1. Suggest an activity to prove that $\sin i/\sin r$ is constant (or) Write an experimental procedure to obtain the relation between angle of incidence and angle of reflection (or) How do you verify experimentally that $\sin i/\sin r$ is a constant? (or) To prove Snell's law in your lab, a) what are the material do you take? b) what table do you need to note the observations? c) what to prove? d) write the experimental procedure.

2. Explain the formation of Mirages?

- Write the procedure of an activity to find the refractive index of glass slab with vertical shift (or) Suggest an activity to find the refractive index of glass slab using vertical shift?
- Define total internal reflection? Explain with a suitable example (or) Explain the phenomenon of total internal reflection with one or two activities
- How do you prove experimentally that $\angle r > \angle i$ when light travel from denser medium to rarer medium (or) How do you verify experimentally that the angle of refraction is more than angle of incidence when light rays travel from denser to rarer medium

4. Refraction of Light at Curved Surfaces

½ Mark Questions

- What is lens formula and explain the terms in it ??

$$\text{Ans: } \frac{1}{f} = \frac{1}{v} - \frac{1}{u}$$

f = Focal length of the lens, u = Object distance v = Image distance

- A convex lens is made up of 5 different materials. How many of images does it form?

Ans: 5

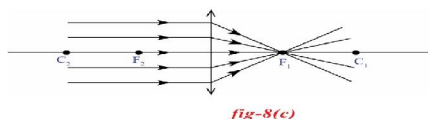
- Which lens always form virtual and diminished image?

Ans: Concave lens

- Which type of lens does the air bubble in water act as ?

Ans: Diverging lens

- In below figure, how do we call the converging point?



Ans: Focal point (or) Focus

- What are the materials required to find out relation among image distance, object distance and focal length of biconvex lens?

Ans: Convex lens, V-stand, light in candle, Screen etc.

- In an experiment of finding focal length of lens the observation are as shown in the table.

U (in cm)	40	30	20
V (in cm)	24	30	38

Which lens is used in this experiment?

Ans: Convex lens

- Which lens can form Real and Virtual image ?

Ans: Convex lens

- Draw the symbol of Convex lens?

Ans:

- In which situation, the value of focal length of a convex lens is equal to the value of image distance

Ans: Object at infinite distance

- What happens to the image distance when the object distance of biconvex lens is decreased?

Ans: Increased

- Name the lens given in the figure ?



Ans: Plano-Convex lens

- The Radius of curvature of plane surfaces _____

Ans: Infinity (or) $R = \infty$

- Where should we place an object before a convex lens to get real, inverted and diminished image?

Ans: Beyond C

- What happens to the focal length of the convex lens when it is kept in water?

Ans: Increases

- P: Light ray passing along the principal axis is un deviated.

Q: Light ray passing through the focus is un deviated.

A) P, Q both are correct B) P is correct, Q is incorrect

C)P in correct, Q is correct D)P,Q both are incorrect

Ans: B

17. Focal length of a convex lens is 25 cm. To get image of same size of an object, where should we kept the object before this convex lens on its principal axis?

Ans: 50 cm

18. Which of the following materials cannot be used to make lens?

A) Water B) Glass C) Plastic D) Clay

Ans: D

19. Find the focal length of plano convex lens, when its radius of curvature of the surface is R and n is the refractive index of the lens?

Ans: $f = \frac{R}{n-1}$

20. In which situation, the value of focal length of the lens is equal to the value of the image distance?

Ans: Object at infinite distance

21. Write lens maker's formula for plane surfaces

Ans: $f = \infty$

22. P: Light ray passing along the principal axis is undeviated

Q: Light ray passing through the focus is undeviated

A) P,Q both are correct B) P is correct, Q is incorrect C) P is incorrect, Q is correct D) P,Q both are incorrect

Ans: B

23. Which lens is called converging lens?

Ans: Convex lens

24. Real, inverted and magnified image is formed by convex lens. Find the place of the object on the principal axis?

Ans: Between C and F

25. What we call when a line joins the centre of curvature and the pole of a curved surfaces?

Ans: Principal axis

26. An object is placed at the focus of a concave lens. Where will its image be formed

Ans: Between Optic centre and focus

27. Where do we place an object in front of convex lens in order to get virtual, erect and magnified image ?

Ans: Between Optic centre and Focus

28. Assertion (A): A person standing on the land appears taller than his actual height to a fish inside a pond

Reason (R): Light bends away from the normal as it enters air from water

Which of the following is correct?

a) Both A and R are true and R is the correct explanation of A

b) Both A and R are true and R is not the correct explanation of A

c) A is true but R is false d) A is false but R is true

Ans: a

29. The lower half of a convex lens is blacked. What would be the nature of the image

Ans: Full image is formed, but low brightness

1 Mark Questions

1. Ammalu wants make a lens in the class room. Which formula she used to make a lens write it?

Ans: $\frac{1}{f} = (n - 1) \left[\frac{1}{R_1} - \frac{1}{R_2} \right]$

2. What is a lens ?

Ans: A lens is formed when a transparent material is bounded by two surfaces of which one or both surfaces are spherical

3. Mention the position and nature of image formed by a concave lens when object is kept on its principle axis at certain distance other than infinity ?

Ans: Virtual, Erected and diminished image

4. 'Radius of curvature of a lens is lies only on principal axis'. How can you support this statement?

Ans: I support this statement. To draw a ray diagrams easily, radius of curvature of a lens is lies only on principal axis.

5. Write the behavior of a light ray when it is passing through the optic centre of a convex lens

Ans: Undeviated

6. Suppose you are inside the water in a swimming pool near the edge. A friend is standing on the edge. Do you find your friend taller or shorter than his usual height? Why?

Ans: My friend appears to be taller. Because the light ray bend towards normal, when light ray travels from rarer medium to denser medium.

7. What is the distance between object and image, when object is kept in the front of convex lens at centre of curvature

Ans: 2R

8. Write the relation in between refractive indices of two media, object distance, image distance and radius of curvature?

Ans: $\frac{n_2}{v} - \frac{n_1}{u} = \frac{n_2 - n_1}{R}$

9. Can you find the minimum limiting object distance for obtaining a real image?

Ans: Yes, this minimum limiting object distance is called focal length

2 Marks Questions

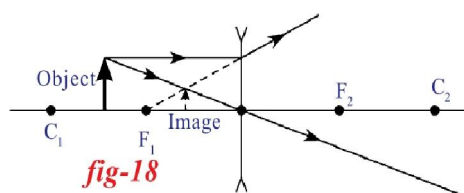
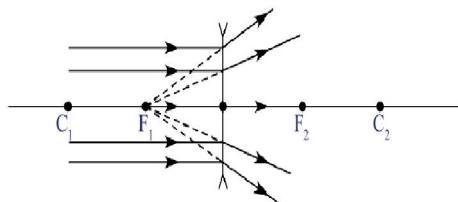
1. Harsha tells Siddhu that the double convex lens behaves like a convergent lens. But Siddhu knows that Harsha's assertion is wrong and corrected Harsha by asking some questions. What are the questions asked by Siddhu? (or) Akash said the Biconvex lens works as converging lens. But Sneha knows that Akash's assertion is wrong and corrected Akash by asking some questions. What would be the questions asked by Sneha?

- Ans:** a) In which situation, double convex lens behaves as divergent lens?
 b) What happens to the rays when the object kept in between optic centre and focal point?
 c) What type of images is formed by double convex lens?
 d) How does air bubbles in water behaves?

(Write any two relevant questions)

2. Draw a ray diagrams for Concave lens

Ans:



3. An object is placed at a distance of 60 cm from a convex lens of focal length 20cm. find the nature and position of the image. (or) The focal length of a converging lens is 20cm. An object is 60cm from the lens. Where will the image be formed and what kind of image is it?

Ans: Given $u=60\text{ cm}$ $f=20\text{ cm}$ $v=?$

$$\text{Lens formula of convex lens } \frac{1}{f} = \frac{1}{v} + \frac{1}{u}$$

$$\frac{1}{20} = \frac{1}{v} + \frac{1}{60} = \frac{3-1}{60} = \frac{2}{60} = \frac{1}{30}$$

$$v=30\text{ cm}$$

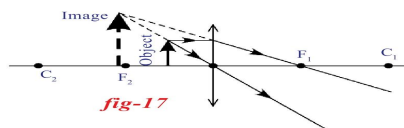
The object is placed beyond C, hence real, inverted and diminished image

4. Write the rules to draw ray diagrams for image formation by lenses.

- Ans:** i) Select a point on the object placed at a point on the principal axis. ii) Draw two rays that were chosen by you from rays mentioned. iii) Extend both rays to intersect at a point. This point gives position of the image. iv) Draw a normal from point of intersection to the principal axis. v) Length of this normal represents the size of the image.

5. The Information given from the above figure, answer the following questions.

- Write the nature of the image?
- What is the lens shown in the figure?



- Ans:** 1. Virtual, Erected and Enlarged (Magnified) image
 2. Convex lens

6. A man wants to get a picture of a zebra. He photographed a white donkey after fitting a glass, with black stripes on to the lens of his camera. What photo will get? Explain.

Ans: He will get a photograph of white donkey with low intensity. This is because the reflected light from the donkey enters the lens of the camera through the openings of the stripes and form the full image.

7. Fill the following box, by given information.

S.NO	Place of Object	Place of Image	Size of Image
1	At C		
2		Infinite distance	

Ans:

S.NO	Place of Object	Place of Image	Size of Image
1	At C	At C	Same
2	At F	Infinite distance	Enlarged

8. Find the refractive index of the glass which is symmetrical convergent lens if its focal length is equal to the radius of curvature of its surface?

Ans: Given $f=R$

$$\text{Focal length of symmetrical convergent lens } \frac{1}{f} = (n - 1) \frac{2}{R} = (n - 1) \frac{2}{f}$$

$$n-1=1/2$$

$$n=3/2=1.5$$

9. Your friend is not able to distinguish between concave and convex lenses. Ask two suitable questions to understand the differences between the lenses?

Ans: a) Which lens behaves as converging lens?
 b) Which lens behaves as diverging lens?
 c) What type of images is formed by convex lens?
 d) What type of images is formed by concave lens?
 (Write any two relevant questions)

10. A double convex lens has two surfaces of equal radii 'R' and refractive index $n=1.5$ Find the focal length

Ans: Given $n=1.5$

$$\text{Focal length of symmetrical convergent lens } \frac{1}{f} = (n - 1) \frac{2}{R}$$

$$\frac{1}{f} = (1.5 - 1) \frac{2}{R} = \frac{1}{2} \times \frac{2}{R} = \frac{1}{R}$$

$$f=R$$

11. Write lens maker's formula and explain the terms in it.

$$\text{Ans: } \frac{1}{f} = (n - 1) \left[\frac{1}{R_1} - \frac{1}{R_2} \right]$$

f = Focal length of the lens n = Refractive index of the lens R_1, R_2 = Radii of curvatures of two surfaces of the lens

4 Marks Questions

- i) Draw a ray diagram to form a real, inverted and magnified image by convex lens ii) Draw a ray diagram to form a virtual, magnified image by convex lens. (or) Draw the ray diagrams which show the formation of image with the following characteristics by a convex lens.
 A) Real, inverted and magnified image. B) Erect, virtual and magnified image.
- State any four differences between convex and concave lens.
- You have a lens, suggest an experiment to find out the focal length of the lens.
- Draw the ray diagrams for the following situations. Explain the position and characteristics of image.
 (i) When the object is at $2F_2$. (ii) When the object is between F_2 and 'O'
- Sridhar has a Bi convex lens. Suggest him an experiment to find out the focal length of the lens by U-V method?
- Draw the information of an image by image using the convex lens? Write nature of the image?
 a) Object is placed at infinity. b) Object is placed between F and C.
- How do you verify experimentally that the focal length of a convex lens is increased when it is kept in water?
- Find the radii of curvature of a convexo-concave convergent lens made of glass with refractive index $n=1.5$ having focal length of 24cm. One of the radii of curvature is double than other

5. Human Eye and Colourful World

½ Mark Questions

1. What materials are required in an experiment to produce a rainbow in our classroom?

Ans: Metal tray, White light, Water, Mirror and Screen

2. Which of the following properties does not change during refraction?

A) wave length (b) frequency (c) speed (d) none

Ans: b

3. Which lens is concave?

Lens	Focal length (cm)
A	+20
B	-15

Ans: B

4. What do you observe when white light is passed through the prism?

Ans: The splitting of white light into 7 colours(VIBGYOR)

5. Name the part of the eye that has real, inverted image of the object formed on it.(or) Identify the part of human eye where image of an object is formed.

Ans: Retina

6. Assertion(A): Blue colour of sky appears due to scattering of light

Reason(B): Blue colour has shortest wavelength among all colours of white light.

Which is correct A or B

Ans: A

7. Give the values of maximum and minimum focal length of eye lens ? (or) What are the limits to change the focal length of eye lens?

Ans: 2.5 cm and 2.27 cm

8. Predict the reason behind the formation of a Rainbow ?

Ans: Dispersion

9. Doctors use biconvex lens to treat which eye defect? (or) A person is advised to wear spectacles with convex lens.

What type of defect of vision is he suffering from?

Ans: Hypermetropia

10. Which lens is used to correct the eye defect presbyopia ? (or) How do you correct the defect Presbyopia ?

Ans: Bi-focal lens

11. What is the name of the Indian Scientist explained about scattering of light ?

Ans: Sir C.V.Raman

12. Which part of eye helps to change the focal length of eye lens?

Ans: Ciliary muscles

13. If focal length of lens is 50cm, then find the power of the lens?

Ans: $P = \frac{100}{f} = \frac{100}{50} = 2 D$

14. Write the lens used to correct "myopia"?

Ans: Bi-concave lens

15. What is the image distance in the normal human eye?

Ans: 2.5 cm

16. A: The splitting of white light into different colours is called Dispersion

R: Dispersion mainly depends upon the size of the particles

A) Both A, R are correct, R is correct explanation. B) Both A, R are correct, R is not correct explanation.

C) A is correct, R is incorrect.

D) A is incorrect, R is correct.

Ans: C

17. Vagdevi(V): The energy of red colour is lower wave length or higher frequency

Likhitha(L): The energy of red colour is higher wave length or lower frequency

A) Both V and L are correct

B) Both V and L are wrong

C) V is correct, L is wrong

D) V is wrong, L is incorrect

Ans: C

18. Match the following

Section-A

1. Myopia

2. Hypermetropia

3. Presbyopia

Section-B

a) Convex lens

b) Vision defect with age

c) Concave lens

Ans: 1-c, 2-a, 3-b

19. What is the value of least distance of distinct vision for healthy human being?

Ans: 25 cm

20. What is distance between eye lens to retina?

Ans: 2.5 cm

21. What is the value of angle of vision for healthy human being?

Ans: 60°

22. Arrange the colours in rainbow order

i) Orange ii) Blue iii) Violet iv) Red v) Green

Ans: iii), ii), v), i) and iv)

23. Write SI unit of power of lens

Ans: Dioptre

24. Which type of images forms by eye lens?

Ans: Real and inverted image

25. Arrange the correct order in the process of formation of rainbow

Refraction, Refraction, Dispersion, Reflection

Ans: Refraction, Dispersion, Reflection, Refraction

1 Mark Questions

1. The Doctor Advised to used 2D lens to correct eye defect. What is its focal length?

Ans: Given P= 2D

$$\text{Focal length of the lens } f = \frac{1}{P} = \frac{1}{2} = 0.5 \text{ m or } 50 \text{ cm}$$

2. A biconvex lens of focal length 50cm is recommended to correct the vision defect of a man. Find the power of the lens?

Ans: Given f=50 cm

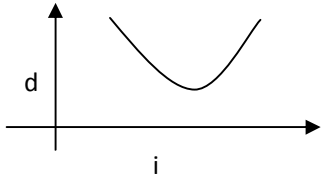
$$\text{Power of lens(} P) = \frac{100}{f} = \frac{100}{50} = 2 \text{ D}$$

3. What is the role of rods and cones in the human eye?

Ans: Cones-Identify the colour, Rods- Identify the intensity of light

4. Draw a rough graph between angle of incidence and angle of deviation of a prism.

Ans:



5. Define Dispersion of light?

Ans: The splitting of white light unto different colours(VIBGYOR) is called Dispersion

6. Define Scattering of light?

Ans: The process of re-emission of absorbed light in all directions with different intensities by atoms or molecules is called scattering of light

7. Write one difference between Myopia and Hypermetropia ?

Ans:

Myopia	Hypermetropia
1. Some people cannot see objects at long distances but can see nearby objects clearly. This type of eye defect is called 'Myopia'	1. Some people cannot see objects at near distances but can see long objects clearly. This type of eye defect is called 'Hypermetropia'
2. It is called near sightedness	2. It is called far sightedness
3. Focal length is less than 2.5 cm	3. Focal length is greater than 2.27 cm
4. $f = -D$	4. $f = 25d/d - 25$
5. Far point exist this eye defect	5. Near point exist this eye defect
6. By using concave lens ,corrected this eye defect	6. By using convex lens, corrected this

(Write any one relevant difference)

8. The sky appear dark instead of blue to an astronaut. Give reason.

Ans: The sunlight will not be scattered in the absence of atmosphere. So the sky appear dark instead of blue to an astronaut

9. What is the role of rods and cones in human eye?

Ans: Cones-Identify the colour, Rods- Identify the intensity of light

10. How could the white light of the sun gives us various colours of the rainbow?

Ans: White light is a mixing of all visible colours. Formation of rainbow are due to dispersion of the sunlight by million of tiny water droplets. Dispersion takes place in water droplets and gives various colours

11. Define accommodation of lens

Ans: The ability of eye lens to change its focal length is called “accommodation of lens” (or) The process of adjusting focal length is called “accommodation of lens”

12. Mention the role of pupil in human eye

Ans: Any light falling on pupil goes into the eye and there is almost no chance of light comes back to the outside.

13. On which factor does the colour of the scattering white light depend?

Ans: Wave length

14. A person is suffering from myopia, his far distance is 5 m. what is the focal length of his eye lens

Ans: Far distance = 5 m

$$\text{Focal length } f = -D = -5 \text{ m}$$

15. Define Power of lens?

Ans: The reciprocal of focal length is called Power of lens

2 Marks Questions

1. Suggest an experiment to produce a rainbow in our classroom ?

Ans: i) Take a metal tray and fill it with water ii) Place a mirror in water such that it makes an angle to the water surface iii) Now focus white light on the mirror through the water iv) Keep a white card board sheet above the water surface v) Now we can observe the white light undergoing dispersion and forming rainbow

2. Explain briefly the reason for the blue of the sky?

Ans: i) The scattering of light is responsible for the blue colour of the sky ii) Our atmosphere contains different types of molecules and atoms iii) The reason for blue sky is due to the molecules N_2 and O_2 , which are presented more in the atmosphere iv) The sizes of these molecules are comparable to the wavelength of blue colour. v) So, the sky appears blue in colour

3. Imagine what happens when Ciliary muscles do not perform contraction and expansion?

Ans: i) If Ciliary muscles do not perform contraction and expansions, focal length of eye lens do not change .
ii) Human eye can see the object at a specific distance only , eye cannot see the object either to near or to farer distance.
iii) Eye defects are formed

4. “A doctor advised to Ravi to use -2D lens for his effect”. Based on this Information answer the questions given below.

a) Identify the eye defect of Ravi b) Find the focal length of lens. (OR)

A boy who is suffering from eye defect has been given a prescription as -2D. Based on the information given, answer the following questions

a) Identify the eye defect he is suffering b) Write the nature and focal length of the lens

Ans: a) Myopia

$$b) f = \frac{100}{P} = \frac{100}{-2} = -50 \text{ cm} \quad (\text{Bi-concave lens})$$

5. Which precautions will you take during the experiment to find refractive index of a prism?

Ans: i) Pins should be fixed perfectly vertical ii) Properly place the prism in its position (triangle) again

6. How do you appreciate the role of molecules in the atmosphere for the blue colour of the sky?

Ans: i) The sky appear blue due to atmospheric refraction and scattering of light through molecules ii) The reason for blue sky is due to the molecules N_2 and O_2 , which are presented more in the atmosphere iii) The sizes of these molecules are comparable to the wavelength of blue colour. iv) Those molecules act as scattering centres for scattering of blue light v) We should appreciate the molecules which are scattering centres

7. What happens when the pupil is not working in the eye?

Ans: Amount of light entering our eye will not be controlled and it leads to damage of eye. Some neurologic conditions are occur

8.

Focal length (f) in cm	100	50	25
Power of the lens(P) in diopter	1	2	4

From the above table, answer the following questions.

(i) What is the relation between ‘P’ and ‘f’?

(ii) If $f = 200 \text{ cm}$, what is the power of the lens (P)?

Ans: i) Power of lens is the reciprocal of focal length of lens (or) $P = 1/f$ (f in metre)

$$ii) P = \frac{100}{f} = \frac{100}{200} = \frac{1}{2} = 0.5D$$

9. What happens if dispersion and scattering of light do not occur?

Ans: If dispersion do not occurs, white light does not get split into seven colours and Rainbow does not forms. If scattering don not occurs, Sun always appears white and there will be no colours for objects.

10. Read the following information.

Use a lens of -2D for Kishore.

By above statement what information you can give? And how do you correct the eye defect?

Ans: Eye defect of Kishore is Myopia. He can see nearby objects clearly but cannot see objects at long distance.
By using Bi-concave lens

11. When Raju, a ten years old boy, saw rainbow and so many doubts are raised in his mind. Guess those doubts and ask some questions.

Ans: a) How many colours in the rainbow?
b) What colours are there in rainbow?
c) What is actual shape of rainbow?
d) Which phenomenon is involved in formation of rainbow?
(Write any two relevant questions)

12. Geehta can read a book but she doesn't able to read the letters on blackboard clearly.

a) Name the eye defect from which Geetha is suffering?
b) What kind of lens does she has to use to correct her defect?

Ans: a) Myopia
b) Biconcave lens

13. How do you appreciate the role of lenses in medical field?

Ans: i) Bi-concave lens is used to treat Myopia
ii) Bi-convex lens is used to treat Hypermetropia
iii) Bi-focal lens is used to treat Presbyopia

14. Ramu can see the name boards of Buses clearly from long distance. But he cannot read newspaper clearly.

i) What type of eye defects does Ramu have?
ii) What kind of lens does Ramu use to correct his eye defect?

Ans: i) Hypermetropia
ii) Bi-convex lens

15. When Mohan viewed white light through a transparent scale, he observed some colours. Predict and write the phenomenon involved in his observation

Ans: Dispersion of light phenomenon is involved

16. Why sun does not appears red during noon hours?

Ans: At noon hours, due to rise in the temperature water vapour enters into atmosphere which leads to abundant presence of water molecules in the atmosphere. These water molecules scatter the colours of other frequencies (other than blue). All such colours of other frequencies reach your eye and the sky appears white.

17. Write the applications of lenses in day to day life?

Ans: i) Lenses are used in telescopes and microscopes
ii) Lenses are used in binoculars, cinema projectors and cameras
iii) Lenses are used in correction of eye defects
(Write any two applications)

18. Bi-focal lenses are advisable for a person suffers from both myopia and hypermetropia. Justify?

Ans: To correct both myopia and hypermetropia, we need bi-focal lenses which are formed using both concave and convex lenses. Its upper portion consists of the concave lens and lower portion consists of the convex lens.

19. Why does the sun appear reddish early in the morning(or) Why Sun appear red during sunrise and sunset?

Ans: In morning and evening times, during sunrise and sunset, except red light all colours scatter more and vanish before they reach you. Since scattering of red light is very small, it reaches you. As a result sun appears red in colour during sunrise and sunset

20. Abhi asked to differentiate between far point and near point. What questions could you ask to make him to know the differences between far point and near point

Ans: i) In any type of eye defect, the far point is formed?
ii) In any type of eye defect, the near point is formed?
iii) Whether the far point is in the near sightedness or the long sightedness?
iv) Whether the far point is in the near sightedness or the long sightedness?
(Write any two relevant questions)

21. Write the formula of Refractive index of the prism. Explain terms in it?

Ans: Refractive index of the prism, $n = \frac{\sin\left(\frac{A+D}{2}\right)}{\sin\frac{A}{2}}$

n= Refractive index of the prism, A= Angle of prism, D= Angle of minimum deviation

4 Marks Questions

1. Explain the function of the following parts of eye?
i) Retina ii) Ciliary muscles iii) Pupil iv) Eye lens
2. Write the experimentation process for finding refractive index of Prism ? (OR)
Sai wants to find the Refractive index of a prism in the laboratory?
i) What are the materials required? ii) Draw the table which was used in the laboratory?
iii) What is the observation in the experiment? iv) Write the formula used to find the Refraction Index of a prism.
3. Explain the correction of the eye defect Hypermetropia ?
4. What is Hyper metropia ? Draw neat diagrams to show the defect and its correction ? (OR)
What is Myopia? How do you correct the eye defect myopia?
5. After a rain shower Raju observed the rainbow in the sky. He wants to conduct an experiment to produce rainbow in the class room. Explain about the experiment to Raju? (or) Suggest an experiment to produce a rainbow in our classroom?
6. Explain the formation of Rainbow?
7. Seetha can see the nearer objects clearly but not able to see the distant objects clearly. It is observed that far point of her vision is at 2 meters.
i) What is her eye defect ? (ii) What is the reason for her eye defect?
(iii) Which lens do you suggest to correct her eye defect? (iv) What is its focal length?
(OR)
Ramana cannot see the objects clearly after 2m. Then answer the following.
a) What is his eye defect? b) Which lens do you suggest to correct his eye defect?
c) What is the focal length of that lens? d) Find the power of lens?
8. A last bench student Jayanth cannot see letter on black board clearly. Which defect he has? Draw diagram showing this defect and its correction.
9. A student is unable to read the book near to him. What type of eye defect is this? Draw a ray diagram to illustrate this defect. Draw a ray diagram to show how this defect may be corrected using a lens

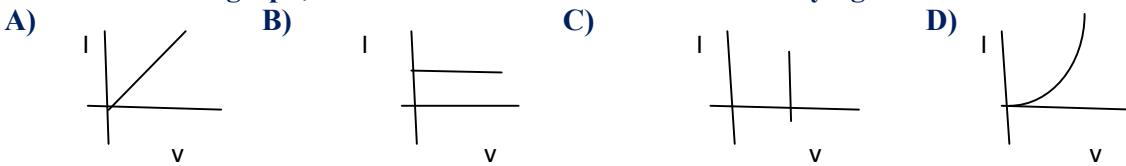
9. Electric Current

½ Mark Questions

1. Statement P: Conductors like metals contain a large number of free electrons.
Statement Q: In Conductors positive ions are fixed in their locations.
a) P and Q are true b) P true and Q false c) P and Q are false d) P false and Q true
Ans: a
2. Which parameter, we cannot measure when ammeter is not working in an electric circuit ?
Ans: Electric current(I)
3. From the ohm's law experiment, what is the relation between potential difference and the current passing through a conducting wire between two points.
Ans: Potential difference is directly proportional to current (OR) $V \propto I$
4. What is the unit of electric power consumption ?
Ans: Kilo Watt Hour (KWH)
5. Which apparatus is used to change the electric current flowing through the circuit in the experiment used to prove Ohm's law?
Ans: Rheostat
6. What type of electric connections observed in the household electrical appliances?
Ans: Parallel connection
7. What is the Unit for Conductivity ?
Ans: $(\Omega\text{-m})^{-1}$ (OR) $(\text{ohm-meter})^{-1}$
8. What happens when a bulb failed in series connection ?
A) All bulbs will not glow B) Remaining bulbs will glow C) A and B D) Neither A nor B.
Ans: A
9. Joule/ Coulomb is same as
(a) 1-watt (b) 1-volt (c) 1-amp (d) 1-ohm
Ans: b
10. Match the following
(X) 1 Ohm (P) 1 Colounb / 1 sec
(Y) 1 Ampere (Q) 1 Watt / 1 sec
(R) 1 Volt / 1 Ampere
(A) X-Q, Y-P, (B) X-R, Y-P (C) X-Q, Y-R (D) X-R, Y-Q

Ans: B

11. A uniform wire of resistance 10Ω is cut into five equal parts. These parts are now connected in series. Find the equivalent resistance of the wire
Ans: 10Ω
12. Express 1 KWH in Joules?
Ans: $1\text{KWH} = 3.6 \times 10^6 \text{J}$
13. If three batteries of potential differences are 1.5V, 2V and 3V connected in series combination in circuit, then what is the total potential difference in the circuit?
Ans: 6.5V
14. X: Resistance of a conductor depends on its length
 Y: Resistance of a conductor depends on the nature of the conductor
 Judge the above statements
Ans: Both X and Y are correct
15. What is the relation between resistivity (ρ), resistance (R), Length of the conductor (l) and area of cross section (A) of the conductor
Ans: $R = \rho \frac{l}{A}$
16. Write the S.I unit of Electric power?
Ans: watt
17. A battery of 6V is applied across a resistance of 15Ω . Find the current flowing through the circuit
Ans: 0.4 A
18. What is the resultant resistance of series combination of 12Ω , 16Ω .
Ans: 28Ω
19. For an electric iron of 1KW rating at 220V fuse of how much capacity is to be used
Ans: 4.54 A
20. Name the instrument used to measure both electric current and potential difference
Ans: Multi meter
21. What is the resistance of an electric arc lamp if the lamp was 20A when connected to a 200V line
Ans: 10Ω
22. Pick the correct graph, When an LED is connected while verifying ohm's law



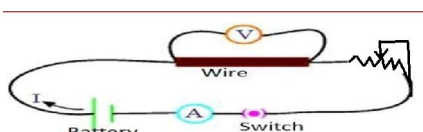
Ans: D

23. What is the S.I unit of Resistivity
Ans: $\Omega\text{-m}$ (OR) ohm-meter

1 Mark Questions

1. Give examples for Ohmic conductors and non Ohmic conductors.
Ans: Ohmic conductors - Metals
 Non Ohmic conductors – LED, Semi conductors, Gaseous conductors
2. Define Resistivity of a conductor ?
Ans: The resistance per unit length of a unit cross section of the material is called resistivity.
3. What is the resultant resistance when resistances of 2Ω , 4Ω , and 6Ω are connected in series.
Ans: $R_1 = 2\Omega$ $R_2 = 4\Omega$ $R_3 = 6\Omega$
 Resultant resistance in series $R = R_1 + R_2 + R_3 = 2 + 4 + 6 = 12\Omega$
4. Draw a neat labeled diagram for the circuit used in Ohm's Law experiment?

Ans:



5. Define emf?

Ans: Work done by the chemical force to move unit positive charge from negative terminal to

positive terminal of the battery.

6. On what factors does the resistivity depend?

Ans: Nature of the material and Temperature

7. State the Kirchhoff's junction law

Ans: At any junction point in a circuit where the current can divide, the sum of the currents into the junction must equal the sum of the currents leaving the junction. (OR) The algebraic sum of the currents at any junction of a circuit is zero.

8. Why should we connect electric appliances in parallel in a household circuit?

Ans: In parallel connection, if any electric appliance is switched off, other appliances are working

9. State Ohm's law

Ans: The potential difference between the ends of conductor is directly proportional to the electric current passing through it at a constant temperature.

10. How is power related to current and voltage?

Ans: Power is the product of current and voltage (or) $P = VI$

11. What is lattice?

Ans: The arrangement of the positive ions is called lattice

12. What happens to the resistance of a conductor, if we increase its length?

Ans: Resistance of a conductor also increases

13. When do you say that two or more resistors are connected in parallel?

Ans: The equivalent resistance of combination is less than the resistance of each of the resistors.

14. Define electric power? Write S.I units?

Ans: Electric power is the product of potential difference and the current. SI unit is watt(W)

15. Define conductivity?

Ans: The reciprocal of resistivity is called conductivity.

16. Give one application of Ohm's law in daily life

Ans: Electric device like electric bulb, iron box and regulators are some applications of Ohm's law

17. What is the reason for using Tungsten as a filament in electric bulb?

Ans: The filament of an electric bulb is usually made of Tungsten, because of its higher resistivity values and melting point 3422°C

2 Marks Questions

1. How can you appreciate the role of a small fuse in house wiring circuit in preventing damage to various electrical appliances connected in the circuit? (or) Why do we use fuses in household circuits?

- Ans:**
- A fuse wire is a thin wire made up of a high resistance material and has a low melting point.
 - The fuse wire should be connected in series with an electrical device.
 - So, the entire current from mains must pass through the fuse.
 - When the current in the fuse overloaded, the wire gets heated and melted.
 - Then the circuit becomes open and prevents the flow of current.
 - Hence, all the electrical appliances are saved from damage that could be caused by overload.
 - So, I appreciate the role of small fuse in the house wiring circuit in preventing damage to various electrical appliances.

2. What will happen of heating element in electrical stoves is made of low resistivity material such as silver?

Ans: If heating element is made of low resistivity such as silver, it produces less heat energy and take more time for cooking. Hence, Consumption of more electrical energy.

3. What is the resistance under normal working conditions of a 240 V electric lamp rated at 80 watt ?

Ans: Given $V=240\text{V}$, $P=80\text{W}$, $R=?$

$$R = V^2/P = \frac{240 \times 240}{80} = 720\Omega$$

4. Find the current passing through the circuit when 22 Volts battery and 10 Ohms resistant are connected ?

Ans: $V=22\text{V}$, $R=10\Omega$, $I=?$

$$\text{From Ohm's law } I = \frac{V}{R} = \frac{22}{10} = 2.2\text{ A}$$

5. In a circuit, 60V battery, Three resistances $R_1=10$, $R_2=20$ and $R_3=X$, are connected in series. If 1 ampere current flows in current, find the resistance in R_3 by using Kirchhoff's loop law

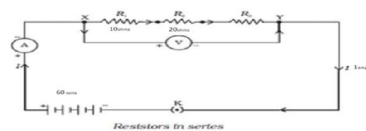
Ans: $V=60\text{V}$ $I=1\text{A}$, $R_1=10\Omega$, $R_2=20\Omega$, $R_3=?$

Applying Kirchhoff's loop law

$$60 - 10 \times 1 - 20 \times 1 - R_3 \times 1 = 0$$

$$60 - 10 - 20 - R_3 = 0$$

$$30 - R_3 = 0$$



$$R_3 = 30 \Omega$$

6. In a house electrical appliances are using as follows:

Electrical appliance	Number of appliances used	wattage	Usage in hours per 1 day
Bulb	2	40W	5 hours
Fan	1	80W	10 hours
T V	1	60W	5 hours

Find the electrical energy used in 30 days ?

$$\text{Ans: Number of units(Bulb)} = \frac{\text{No.of Item} \times \text{wattage} \times \text{usage hours} \times 30}{1000} = \frac{2 \times 40 \times 5 \times 30}{1000} = 12 \text{ KWH}$$

$$\text{Number of units(Fan)} = \frac{\text{No.of Item} \times \text{wattage} \times \text{usage hours} \times 30}{1000} = \frac{1 \times 80 \times 10 \times 30}{1000} = 24 \text{ KWH}$$

$$\text{Number of units(T V)} = \frac{\text{No.of Item} \times \text{wattage} \times \text{usage hours} \times 30}{1000} = \frac{1 \times 60 \times 5 \times 30}{1000} = 9 \text{ KWH}$$

$$\text{Total number of units} = 12 + 24 + 9 = 45 \text{ KWH}$$

7. Two bulbs have ratings 100W, 220V and 60W, 220V. Which one has the greater resistance?

$$\text{Ans: } \begin{array}{l} \text{1}^{\text{st}} \text{ bulb} \\ \text{P}_1 = 100\text{W} \\ \text{V}_1 = 220\text{V} \end{array}$$

$$\begin{array}{l} \text{2}^{\text{nd}} \text{ bulb} \\ \text{P}_2 = 60\text{W} \\ \text{V}_2 = 220\text{V} \end{array}$$

$$\text{Resistance of 1}^{\text{st}} \text{ bulb (R}_1\text{)} = \frac{V^2}{P_1} = \frac{220 \times 220}{100} = 484 \Omega$$

$$\text{Resistance of 2}^{\text{nd}} \text{ bulb (R}_2\text{)} = \frac{V^2}{P_2} = \frac{220 \times 220}{60} = 806.6 \Omega$$

So, 2nd bulb has the greater resistance

8. What are the limitations of Ohm's law?

- Ans: i) Ohm's law is valid for metal conductors
 ii) Ohm's law is not applicable to gaseous conductors.
 iii) Ohm's law also not applicable to semiconductors

9. A house has 3 tube lights of 20 watts each. On the average, all the tube lights are kept on for five hours. Find the energy consumed in 30 days.

$$\text{Ans: Number of units} = \frac{\text{No.of Item} \times \text{wattage} \times \text{usage hours} \times 30}{1000} = \frac{3 \times 20 \times 5 \times 30}{1000} = 9 \text{ KWH (or) 9Units}$$

10. Write the differences between potential difference and emf

Ans:

Potential difference	emf
1. Work done by the electric force to move unit positive charge from one point to another point is called potential difference	1. Work done by the chemical force to move unit positive charge from negative terminal to positive terminal of the battery
2. Its symbol is 'V'	2. Its symbol is 'ε'
3. S.I unit is volt(V)	3. S.I unit is volt(V)
4. $V = W/q$	4. $\epsilon = W/q$
5. This can be measured by using voltmeter	5. This can be measured by using voltmeter

(Write any two differences)

11. How can you appreciate the use of multi meter?

- Ans: i) A multi meter is an electronic measuring instrument that combines several measurement functions in one unit.
 ii) It can measure current, voltage and resistance for AC and DC
 iii) So, I appreciate the use of multi meter

12. Define "Potential difference" (or) Voltage and name the instrument to measure the potential difference in a electric circuit?

Ans: Work done by the electric force to move unit positive charge from one point to another point is called potential Difference. A voltmeter is used to measure potential difference

13. Define electric current? Write its units?

Ans: The amount of charge crossing any cross section of the conductor in one second. SI unit is ampere(A)

14. What do you mean by electric shock? Explain how it takes place

Ans: Electric shock is a combined effect of potential difference, electric current and resistance of the human body. When current flows through human body, resistance of a body gradually changes. As long as current flow continues inside the body, resistance too decreases. This is called "electric shock"

15. Explain overloading of household circuits

Ans: 1. Generally we observe the values noted on the digital meters fixed at homes as follows

Potential difference: 240V Current: 5-20A

- This means the line wires that are entering the meter have a potential difference of 240V.
- The minimum and maximum limit of current that can be drawn from the mains is 5-20A.
- Thus, the maximum current that we can draw from the mains is 20A.
- When the current drawn from the mains is more than 20A. Overheating occurs and may cause a fire. This is called over loading

16. Distinguish between ohmic and non ohmic conductors

Ans:

Ohmic Conductor	Non-Ohmic Conductor
1.The conductors which obey Ohm's law are called Ohmic conductors	1.The conductors which does not obey Ohm's law are Non- Ohmic conductors
2.Shape of V-I graph is Straight line	2.Shape of V-I graph is Curved
3.Ex: Metals	3.Ex: Semiconductors, LED

17. A wire of length 1m and radius 0.1 mm has a resistance of 100Ω, find the resistivity of the material

Ans: Given $l=1\text{m}=1000\text{mm}$, $r=0.1\text{ mm}$, $R=100\Omega$

$$A = \pi r^2 = \frac{22}{7} \times (0.1)^2 = 3.14 \times 0.01 \text{ mm}^2 = 0.0314 \text{ mm}^2$$

$$\rho = \frac{RA}{l} = \frac{100 \times 0.0314}{1000} = 0.00314 \Omega - \text{mm}$$

18. Resistivity of various materials are given under. Study and answer the questions

Material	Silver	Copper	Tungsten	Nichrome	Silicon
P at 20°C	1.59×10^{-8}	1.68×10^{-8}	5.60×10^{-8}	1.10×10^{-6}	6.40×10^2

a) Write the S.I unit of Specific resistance

b) Nichrome is used as heating elements. Why?

Ans: a) $\Omega\text{-m}$

b) Nichrome is alloy, it have large values of resistivity than metals.

19. Are the head lights of a car connected in series or parallel? Why?

Ans: Parallel. When they are connected in parallel, same voltage will be maintained in the two lights. If one of the head light damage/not working/fail, the other head light keeps working.

20. Why doesn't a bird get a shock when it stands on a high voltage wire?

Ans: When the bird stands on a high voltage wire, there is no potential difference between the legs of the bird because It stands on a single wire. So no current passes through the bird. Hence, it doesn't feel any electric shock.

4 Marks Questions

- What are the materials do you collect to prove that the resistance of a conductor is inversely proportional to its area of cross section. Explain the experimental Procedure?
- Explain Kirchhoff's laws with example?
- Deduce the expression for the equivalent resistance of three resistors connected in series ?
- “Potential difference in a conductor is directly proportional to the current passed through it “Prove it with an activity ? (OR) Describe an experiment which proves that V/I is not constant for Non-Ohmic conductors? (OR) State ohm's law suggest an experiment to verify it and explain the procedure (or) How do you experimentally the ratio V/I is a constant for a given conductor
- Suggest an activity to show that the equivalent resistance of parallel combination is less than the resistance of each resistor?
- How to prove that resistance of a conductor is proportional to the length of the conductor for constant cross section area and temperature

10. Electromagnetism

½ Mark Questions

- The direction of current flowing in a coil is shown in figure. What type of magnetic pole is formed at the face of the coil?

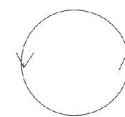
Ans: N- Pole

- What is the shape of magnetic field produced by long straight current carrying wire?

Ans: Circular shape

- Write the mathematical expression of Faraday's law ?

Ans: $\varepsilon = \frac{\Delta \phi}{\Delta t}$



4. Name one source of direct current.

Ans: Battery, DC Generator,

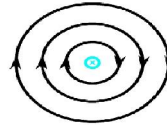
5. Write the S.I unit of magnetic flux ?

Ans: weber

6. Name the device that reverse the direction of current in the coil of an electric motor ?

Ans: Commutator

7. See the figure, magnetic lines are shown. In what direction does the current through wire flow?



Ans: Into page

8. What should be connected commutator to convert AC generator into DC generator?

Ans: Two half slip rings

9. What is the device which converts electrical energy into mechanical energy?

Ans: Electric motor

10. Which of the following converts mechanical energy into electrical energy ?

- a) Electric motor b) Battery c) Generator d) Switch

Ans: c

11. A: A magnetic field exists in the region surrounding a bar magnet.

R: A magnetic field is characterized by strength and direction.

A) Both A, R are correct, R is correct explanation. B) Both A, R are correct, R is not correct explanation.

C) A is correct, R is incorrect.

D) A is incorrect, R is correct.

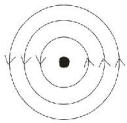
Ans: A

12. Predict the direction of magnetic field lines inside the solenoid?

Ans: From S-pole to N-pole

13. Draw the direction of magnetic lines of force, assuming that current is flowing out of the page?

Ans:



14. In an Oersted experiment which field is responsible for the deflection of compass needle?

Ans: Magnetic field

15. A current carrying wire of length L is placed perpendicular to a uniform magnetic field B. If the current passing through the wire is I then what is the force acting on the wire?

Ans: $F = ILB$

16. A: Magnetic needle in compass deflects when it kept near current carrying wire.

R: Current carrying wire produces magnetic field.

A) Both A and R are correct, R is not correct explanation of A

B) Both A and R are correct, R is correct explanation of A

C) A is correct, R is not correct

D) A is not correct, R is correct

Ans: B

17. What will happens if we pass DC supply in the levitation experiment?

Ans: The metal ring lifts up and falls immediately but does not levitate.

18. In the formula $F = qvB \sin\theta$, What B says in the formula

Ans: Magnetic flux density

19. Write the nature of Generator

Ans: Mechanical energy converts into electrical energy

20. Magnetic field lines leave the _____ pole of a bar magnet and enter at its _____ pole

Ans: N-pole, S-pole

21. What is the unit of magnetic flux density

Ans: weber/meter² (or) Tesla

22. Faraday's law of induction is the consequence of _____

Ans: Law of Conservation of energy

23. Match the following

- A) \emptyset () P) ILB

- B) F () Q) BA
R) B/v

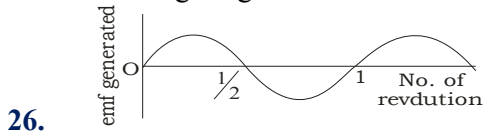
Ans: A-Q, B-P

24. Name the law behind the making of generator

Ans: Faraday's law of electromagnetic induction

25. State the rule which explains the direction of induced emf in a coil?

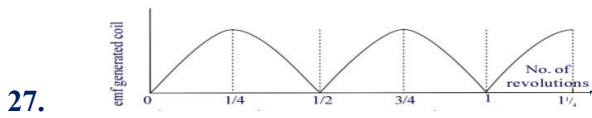
Ans: Fleming's right hand rule



The given figure represents _____

- A) Electric motor B) AC Generator C) DC Generator D) All of these

Ans: B



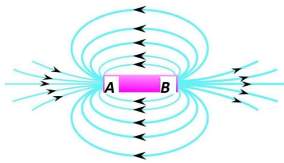
The give figure represents _____

- A) Electric motor B) AC Generator C) DC Generator D) All of these

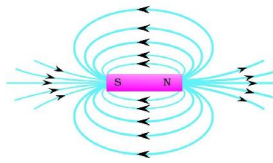
Ans: C

1 Mark Questions

1. Mark the magnetic poles in the given figure by draw again.



Ans:



2. What are the materials required to conduct an Oersted experiment?

Ans: Magnetic compass, Bar magnet, Thermocol sheet, Battery, Key, Wooden sticks.

3. Why does the picture appear distorted when a bar magnet is brought close to the screen of a television?

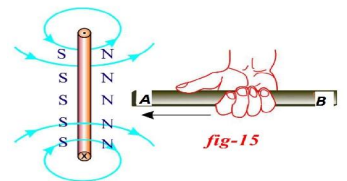
Ans: T.V has a picture tube which produces a motion of electrons on the screen. These electrons are affected by magnetic field of bar magnet. Magnetic field exerts a force on the moving electrons. So, picture distorted

4. For Which purpose Lenz's law is used?

Ans: Lenz's law is used to find the direction of induced EMF in a circuit

5. What are the magnetic poles those are indicated by A&B in the given figure?

Ans: A- N pole
B- S pole

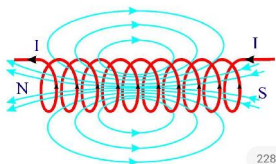


6. State the Lenz's Law?

Ans: The induced current will appear in such a direction that it opposes the changes in the flux in the coil

7. Draw magnetic lines of force around a solenoid?

Ans:



8. What is meant by a solenoid?

Ans: Solenoid is a long wire wound in a close packed helix

9. What is right hand thumb rule?

Ans: When you curl your right hand fingers in the direction of current, thumb gives the direction of magnetic field

10. List out the apparatus required to prove magnetic field exerts force on current carrying conductor

Ans: Horseshoe magnet, Conducting wire, Battery, Switch, Wooden plank, Two wood sticks

11. Define magnetic flux density or magnetic field induction

Ans: The magnetic flux passing through unit area taken perpendicular to the field is known as magnetic field induction
(or) The ratio of magnetic flux passing through a plane perpendicular to the field and the area of the plane is called the magnetic flux density

12. Define Magnetic flux.

Ans: Number of lines passing through the plane of area perpendicular to the field is called magnetic flux.

2 Marks Questions

1. A student got confused between AC generator and DC generator. He asked some questions to his teacher to clarify the doubt. What would be those questions?

Ans: i) What is the rule that the AC generator works?
ii) What is the rule that the DC generator works?
iii) Are the direction of current changes in AC generator?
iv) Are the direction of current changes in DC generator?

2. According to this rule if thumb fore finger and middle finger are stretched mutually perpendicularly to each other then, fore- finger gives the direction of magnetic field, and middle finger gives direction of current in conductor then thumb points in the direction of force acting on the conductor. Using the information answer the following questions.

a) Which hand rule it tells? B) Name the device which is used in the rule?

Ans: a) Fleming 's left hand rule b) Electric motor.

3. Seetha said to you that magnetic lines are open and they start at North pole to the end of South pole. What questions do you ask Seetha to correct her by saying field lines are closed? (or) Akshitha said to you that the magnetic field lines are open and they starts at north pole of bar magnet and end at south pole. What questions do you ask Akshitha to correct her saying "Field lines are closed"

Ans: i) What is the direction of field lines inside the bar magnet?
ii) What is the direction of field lines outside the bar magnet?
iii) Are these field lines are closed or open?
iv) What is the nature of field line?

4. Write any two applications of Faraday's Law of Induction in daily life ?

Ans: a) Use of ATM cards b) Induction stove c) Tape recorder d) Metal detectors in Security checking

5. Are the magnetic lines closed? Explain

Ans: Yes, magnetic lines are always closed loops and any two field lines never intersect each other. Inside the magnet the direction of magnetic lines of force is from South pole to North pole. Outside the magnet the direction of magnetic lines of force is from North pole to South pole. Thus, the magnetic lines of force are closed loops.

6. What are magnetic field lines? List any two characteristics of field lines

Ans: An imaginary lines are present in magnetic field is known as magnetic field lines.

Characteristics:- i) Magnetic field lines are curved lines ii) Magnetic field lines do not intersect each other
iii) Magnetic field lines forms closed loops. iv) Magnetic field lines always starts from N-pole and end on S-pole

7. The value of magnetic field induction which is uniform is 2T. What is the flux passing through the surface of area 1.5 m² perpendicular to field

Ans: Given $B = 2T$, $A = 1.5 \text{ m}^2$, $\Phi = ?$
Magnetic flux (Φ) = $BA = 2 \times 1.5 = 3$ weber

8. List any two differences between AC and DC

Ans: Two slip rings are used in AC generator
Two half slip rings are used in DC generator
In AC, Every half rotation, the direction of current changes
In DC, Every half rotation, the direction of current no changes

4 Marks Questions

1. Explain the working of electric motor with a neat diagram.

2. How can you verify that has a current carrying wire produces a magnetic field with the help of an Experiment?

- (or) How do you verify the magnetic field form in a straight wire carrying current are concentric ?
3. State the Faraday's Law of electromagnetic induction and explain it with an activity ?
 4. Explain the working of AC generator with a neat diagram
 5. Explain Oersted experiment with the help of activity?
 6. Draw a neat diagram to show that electric energy is converted into mechanical energy? And labeled it? (or)
Which device is used to convert electrical energy into mechanical energy? Draw a neat diagram and label the parts of this device (or) Draw a neat diagram of electric motor. Name the parts.
 7. Draw a neat diagram to show that mechanical energy is converted into electrical energy? and labeled it? (or)
Draw a neat diagram of an AC generator (or) Draw a neat diagram of DC generator
 8. How do you verify experimentally that the current carrying conductor experiences a force when it is kept in magnetic field

M.SRINIVASA RAO, SA(PS) AFC SCHOOL(AGKMHS) GUDIVADA PH: 9848143855
Visirt: srini science mind