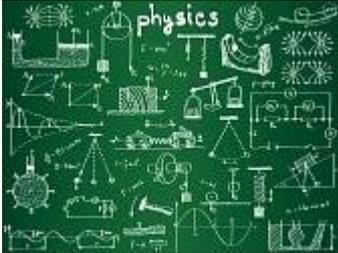


ACADEMIC SESSION 2016-17

CLASS VIII



“The important thing is to not stop questioning. Curiosity has its own reason for existence. One cannot help but be in awe when he contemplates the mysteries of eternity, of life, of the marvellous structure of reality. It is enough if one tries merely to comprehend a little of this mystery each day.

**-Albert Einstein**

An experiment is a question which science poses to Nature, and a measurement is the recording of Nature’s answer.

**- Max Planck**

## KEY FEATURES

This edition is enriched with activities that will be demonstrated/done by the students in class and will provide exposure to a variety of questions that include multiple choice questions, application based questions, very short answer type questions, short answer type questions, figure based questions, etc. to check the child's grasp of the concept.

- The H.O.T.S. (High Order Thinking Skills) questions will help in developing child's logical and analytical thinking and will greatly enhance the development of independent thinking skills.
- The assignments will enable the child to express the taught concepts clearly in the desired format.
- The Recapitulation assignments and Question banks will enable students to be better prepared to appear for the examinations by giving them an idea about the format of the paper and to optimise their speed of writing.
- The FACTOPAEDIA contains amazing scientific facts. This will help in creating awareness among the students about the world of science.
- The sample questions for competitive examinations have been added which would give practice and inspiration to children to appear for competitive examinations.
- Last but not the least – This Smart Skills has been prepared to help the children develop a scientific aptitude by-
  - ✓ Reinforcing concepts
  - ✓ Inspiring them to learn by doing.
  - ✓ Strengthening expression in the desired scientific language.
  - ✓ Developing independent thinking.
  - ✓ Understanding the reasoning of day to day phenomena.

# **INDEX**

## **SYLLABUS**

**Chapter 11- Force and Pressure**

**Chapter 12- Friction**

**Chapter 13- Sound**

**Chapter 14- Chemical effects of Current**

**Chapter 15- Some Natural Phenomena**

**Chapter 16- Light**

**Chapter 11- Stars and the Solar System**

**Question bank**

**Factopaedia in Physics**

**Sample Questions for Competitive exams**

## **SYLLABUS PLAN FOR THE YEAR 2016- 17**

### **TERM I**

#### **APRIL – SEPTEMBER**

##### **TOPIC: FORCE AND PRESSURE**

Scientific meaning and definition of Force, effects of force, Types of Forces in detail, Definition of Pressure, Formula and units of pressure , Numericals based on Pressure, Pressure exerted by liquids and gases, Atmospheric Pressure and its effects.

##### **TOPIC: SOME NATURAL PHENOMENA**

**Lightning, Thunderstorm, Earthquakes.**

##### **TOPIC: FRICTION**

Scientific meaning and Definition of friction, Cause of friction, Factors affecting Friction, Friction a necessary evil- its advantages and disadvantages, Ways of increasing and reducing friction, Fluid friction.

##### **TOPIC: STARS AND THE SOLAR SYSTEM**

Celestial objects- Stars, Planets, Meteors, meteorites, comets, asteroids.

Moon- Description of its surface, Phases of the moon

A few constellations and their shapes.

Planets of the Solar system and a brief information about them.

Artificial satellites- their applications.

### **TERM II**

#### **OCTOBER – MARCH**

##### **TOPIC: LIGHT**

What makes things visible, Reflection of light from a plane mirror, Ray diagrams to show regular and diffused reflection, Ray diagram to show the formation of an image by a Plane mirror, Characteristics of the image formed by a plane mirror, Multiple images formation with plane mirrors ,Laws of light reflection, Structure of the Human eye and the function of its parts, Persistence of vision, Eye care. Braille system for the visually challenged.

##### **TOPIC: SOUND**

Production of Sound, Different categories of Musical instruments and their vibrating parts, Sound needs a medium for Propagation, Characteristics of Sound wave, characteristics of Sound, Numericals related to calculation of Time period, Frequency, Audible and inaudible Sounds, Preliminary idea about the Human ear- Parts and functions, Differences between Noise and Music, Sources and effects of Noise pollution.

##### **TOPIC: CHEMICAL EFFECTS OF CURRENT**

Testing and identification of electrolytes and nonelectrolytes by using different devices , The different chemical effects of current, Electroplating- its advantages and applications.

## CHAPTER 11

### FORCE AND PRESSURE

Define the following-

**Force** is a physical quantity that changes- the state of rest or uniform motion , shape or size of an, speed and direction of an object.

Contact forces-----

-----

Muscular Force

-----

Frictional force

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Noncontact forces-----

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Gravitational force -----

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Electro static force -----

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Magnetic force -----

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Balanced forces-----

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Unbalanced forces-----

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When two or more forces act along the same direction, the net force is calculated by-----

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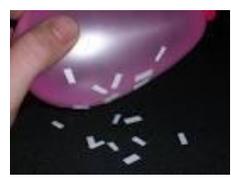
When two or more forces act along the opposite direction, the net force is calculated by-----

-----

**Name the forces exerted, as seen in the given pictures. Also state whether they are contact or noncontact forces?**

Magnetic force

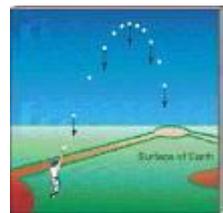
Noncontact Force



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Fill in the blank spaces after observing the given pictures.

Agent exerting the force    Object on which it acts    effect of the force



Palm and fingers

dough

Force changes the shape



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**FORCE AND PRESSURE**  
**CHAPTER 11**

**ACTIVITY 1**

**Aim** – To study the effect of force on a given surface and hence find the relationship between force, pressure and area.

**Materials Required** – A deep tray, refined flour, glass rod, 4-5 glass slabs

**Theory -**

**Diagram –**

**Procedure –**

1. Fill the tray with refined flour and stir it with a glass rod to spread out and loosen the flour.
2. Place a rectangular slab with its three different faces on the flour one by one, and record your observation.
3. Now keep the slab with its maximum dimension in contact with the flour.
4. Arrange the rest of the slabs one on top of the other on the first slab and record your observation.

**Observation –**

1. When the slab is kept with its maximum dimension in contact ,on the flour, \_\_\_\_\_  
\_\_\_\_\_.
2. When the slab is kept with its minimum dimension on the flour, \_\_\_\_\_  
\_\_\_\_\_.
3. When the slab is kept with its maximum dimension on the flour and rest of the  
slabs are kept on it, \_\_\_\_\_.

**Conclusion –**

1. When the area of contact between the slab and flour is more, the pressure-----
2. When this area of contact decreases, the pressure-----
3. The force acting on the flour due to the slabs together is -----
4. Pressure is defined as -----

## ACTIVITY 2

**Aim:** To prove that 'air exerts pressure'

**Materials Required :** Glass, water, cardboard

**Theory:**

**Diagram:**

**Procedure:**

1. Take a glass and fill it with water upto the brim
2. Press the cardboard on the filled glass.
3. Turn the glass upside down.

**Observation:**

---

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---

**Conclusion:**

## CHAPTER 11

### FORCE AND PRESSURE

#### ACTIVITY 2

**Aim:** To show that liquids exert equal pressure in all directions at the same level.

**Materials Required:** Mineral water bottle, water, compass/needle

**Theory:**

**Diagram:**

**Procedure:**

1. Take a bottle and pierce 3-4 holes at the same horizontal level.
2. Paste a cello tape over the holes.
3. Fill it up with water
4. Now peel off the cellotape.
5. Observe what happens.

**Observation:**

---

---

---

**Conclusion:**

---

## Chapter – 11

### FORCE AND PRESSURE

#### Assignment 11.1

**Multiple choice questions:- Tick the appropriate choice.**

- The pull or push acting on a body is called
  - force
  - pressure
  - thrust
  - friction
- Pressure that balances blood and fluid pressure in our body is
  - water pressure
  - atmospheric pressure
  - blood pressure
  - Both (b) and (c)
- Pressure exerted by water in a bucket increases with
  - increase in the diameter of bucket
  - decrease in diameter of bucket
  - volume of the bucket
  - depth of water in bucket
- Force applied per unit area of a surface is called
  - force of friction
  - force of muscles
  - pressure
  - thrust
- A force applied on a rolling ball on the ground can cause
  - an increase in the speed of the ball
  - a decrease in the speed of the ball
  - change in direction of the ball
  - all of these
- Which of the following will exert more pressure if pushed with same force?
  - geometry box
  - sharpener
  - end of a new pencil
  - pointed end of nail
- Which of the following is not an example of contact force?
  - ball rolling on ground
  - horse pulling a cart
  - ball falling on earth
  - man pushing a load
- The SI unit of force is
  - dyne
  - newton
  - gram
  - kilogram

9. Which of the following forces is only attractive?

- (a) electrostatic
- (b) magnetic
- (c) gravitational
- (d) all of these

10. Gravitational force acts

- (a) only between sun and the planets
- (b) only between sun and earth
- (c) only between earth and moon
- (d) between all objects in this universe

**Give one word for the following:-**

- a. A force acting on a body from a distance -
- b. Force acting per unit area of a surface -
- c. A push or pull acting on a body -
- d. A force of attraction acting on all bodies because of every other body

**Pick the correct choice from col B and write them in the centre, matching them with col A.**

Column A		Column B
a. A man blowing a balloon		i. Force can make a stationary object move.
b. A woman pushing a table		ii. Force can stop a moving object.
c. A cricketer catching a ball		iii. Force can change the shape of the object
d. A girl pulling the leash of a running dog		iv. Force can change the direction of a moving object.
e. A driver turning the steering wheel of a car		v. Force can make an object move slower.

## FORCE AND PRESSURE

### Assignment 11.2

1. Fill in the blanks:-

- a. The SI unit of force is \_\_\_\_\_ while that of pressure is -----
- b. \_\_\_\_\_ is force per unit area.
- c. \_\_\_\_\_ and \_\_\_\_\_ are together called fluids.
- d. Liquids exert \_\_\_\_\_ in all directions.
- e. Static electric charges exert \_\_\_\_\_ force whereas magnets exert \_\_\_\_\_ force.
- f. An object slows down when force is applied in the \_\_\_\_\_ direction of its motion.

2. Fill up the columns **B** and **C** with appropriate answers:-

S. No.	Column A (Situation)	Column B (Contact/Non-Contact)	Column C (Type of Force)
1.	Bat hitting a ball		
2.	Between earth and moon		
3.	Man rowing a boat		
4.	Water in river flowing downward		
5.	Between a magnet and a nail		
6.	Between comb(rubbed with hair) and bits of paper		
7.	Between tyres of moving vehicle and the road		

## Chapter – 11

### FORCE AND PRESSURE

#### Assignment 11.3

1. Identify the type of force acting in each of the following cases:-

- a. Water in rivers flow downwards.
- b. A coin slips and falls from your hand.
- c. A straw rubbed with paper attracts another straw.
- d. Magnetic compass deflects when kept under the wire of a simple circuit.
- e. A magnet attracts an iron nail.
- f. A ball rolling on ground comes to rest.
- g. The boat stops as one stops rowing.
- h. A scooter comes to rest as its engine is switched off.
- i. Animals carry out their physical activities.

2. Complete the following paragraph to find out how a vacuum cleaner works:-

A vacuum cleaner works by removing some of the air inside its collecting bag. This reduces the \_\_\_\_\_ inside the bag. So the air pressure outside is \_\_\_\_\_ than the air pressure inside it. The increased air pressure \_\_\_\_\_ the vacuum cleaner pushes air into it, taking dust and bits of dirt along with it.

3. The properties of a liquid in an open vessel are :-

- a. Pressure of the liquid \_\_\_\_\_ with increase in its density.
- b. The liquid exerts pressure on the \_\_\_\_\_ as well as \_\_\_\_\_ of the container.
- c. The pressure of the liquid \_\_\_\_\_ is same in all directions.
- d. The pressure of the liquid \_\_\_\_\_ with an \_\_\_\_\_ in its depth.

**Chapter – 11**

**FORCE AND PRESSURE**

**Recapitulation Assignment**

1. When does force come into play?  
-----  
-----  
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2. In a game of tug of war, the two teams pull equally hard. So, the rope does not move in either direction. Predict the kind of forces acting on the rope?  
  
-----
  
3. Define the two contact forces with one example of each.  
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4. Define the three non-contact forces with one example of each.  
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5. Define pressure and write the mathematical expression for it.  
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-----
  
6. What is the relation between Pascal and  $N/m^2$  ?  
-----
  
7. Where is the liquid pressure greater – 10m below the surface of sea or 20m below?  
-----  
-----
  
8. Why is the force of friction called the contact force?  
-----  
-----
  
9. Why can you not lift a bucket of water without holding it?

**Chapter – 11**

**FORCE AND PRESSURE**

**Assignment 11.5**

1. In a tug of war, two teams A and B exert forces of 65N, 23N, 85 N and 45N, 16N, 78N respectively. What is the net force acting on the rope?

-----  
-----  
-----

2. Two friends Tom and Sam are applying Newton forces of 22 , 33.5 ,22.5 and 14 on a box in the same direction. What will be the net force applied by them?

-----  
-----

3. In a tug of war, side A and B applies net forces of 15 N and 88 N respectively. Which side will the rope move? What is the name given to these forces?

-----  
-----

4. Two objects of masses M and 5M are lying on an equal area. Determine the ratio of pressure exerted by them on the ground.

-----  
-----  
-----

5. How would pressure change if -

a. Area is doubled keeping force constant.-----

b. Force is doubled keeping area constant.-----

6. Calculate the pressure exerted by a force of 400 N on an area of 20 m<sup>2</sup>.

-----  
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-----

7. Calculate the area on which a force of 2000 N exerts a pressure of 25 Pa.

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8. Calculate the pressure exerted on an area 3.5m<sup>2</sup> by a force of 25 N.

-----  
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## Chapter – 11

### FORCE AND PRESSURE

#### Assignment 11.6

Give reasons for the following:-

1. Astronauts have to wear special pressurized suits.



3. Deep sea divers have to wear specially designed suits.
4. A balloon bursts if too much of air is blown into it.
5. War tanks move on caterpillar tracks which cover wheels.
6. One end of the drawing pin is wide while the other end is sharp.

## Chapter – 11

### FORCE AND PRESSURE

#### Assignment 11.7

**[LET US DO]**

Find out 12 words from the grid given on 'Force and Pressure'

[Note: You can go straight, back, up, down or diagonally]

R	A	L	U	C	S	U	M	Q	W	T	Y	U	I
A	A	S	D	I	F	G	H	J	K	L	P	O	O
E	L	E	C	T	R	O	S	T	A	T	I	C	E
B	H	I	R	E	T	U	O	M	P	G	K	L	J
T	G	F	F	N	F	S	A	Z	X	R	C	V	B
H	E	O	U	G	E	N	S	D	F	A	G	H	N
R	H	E	T	A	O	U	E	I	H	V	A	D	S
U	L	N	M	M	F	R	I	C	T	I	O	N	R
S	B	O	E	H	U	P	M	S	D	T	X	C	E
T	U	T	G	S	J	O	B	N	Z	A	J	B	T
K	E	W	S	F	K	L	V	C	X	T	U	Y	E
R	B	E	S	D	F	A	R	T	Y	I	R	T	M
W	R	N	P	A	O	Q	R	F	U	O	E	F	O
P	Q	U	I	O	R	A	T	N	I	N	D	O	R
W	E	R	T	Y	C	D	S	U	O	H	J	K	A
B	L	A	I	S	E	P	A	S	C	A	L	I	B

## Chapter – 15

### SOME NATURAL PHENOMENA

Read the lesson and answer the following questions-

1. Lightning is caused by the accumulation of \_\_\_\_\_ in the clouds.
2. The process of transferring of charge from a charged object to the earth is called \_\_\_\_\_.
3. It is not safe to be in contact with telephone cords, electrical wires and metal pipes during lightning. Why?
4. \_\_\_\_\_ is a device used to protect building from the effect of lightning.
5. An \_\_\_\_\_ is a sudden shaking or trembling of the earth which lasts for a very short time.
6. Earthquakes can cause floods, \_\_\_\_\_ and \_\_\_\_\_.
7. The tremors are caused by the disturbance deep down inside the uppermost layer of the earth called \_\_\_\_\_.
8. The power of an earthquake is expressed in terms of a magnitude on a scale called the \_\_\_\_\_.
9. The seismic waves are recorded by an instrument called the \_\_\_\_\_.
10. \_\_\_\_\_ charges repel and \_\_\_\_\_ charges attract each other.
11. An \_\_\_\_\_ is a device to detect whether a body is charged or not.
12. The boundaries of earth's plates where earthquake tends to occur are called \_\_\_\_\_ zones.

**SOME NATURAL PHENOMENA [LET US DO]**

**Search for 10 natural disasters [You can go up, down, sideways, backwards, diagonally]**

A	V	O	L	C	A	N	O	B	S	D	F	G	H	J	K	L	P	O	I
F	U	Y	T	R	E	W	Q	A	Z	X	C	V	B	N	H	M	N	B	V
L	Q	W	E	R	T	Y	U	I	C	L	O	U	D	B	U	R	S	T	O
O	M	N	V	B	C	X	X	S	Y	D	F	G	H	J	R	K	L	I	L
O	C	L	O	U	D	B	U	R	C	S	T	A	Z	E	R	Q	W	S	C
D	A	D	G	J	K	L	O	P	L	Q	W	E	R	T	I	Y	H	B	A
M	N	B	V	M	O	O	N	A	O	P	E	G	G	O	C	A	S	S	N
E	A	R	T	H	Q	U	A	K	N	B	R	I	D	G	A	I	J	N	L
E	K	A	U	Q	H	T	R	A	E	E	R	T	Y	U	N	H	J	K	A
Z	X	C	V	B	N	M	S	P	O	O	N	F	E	D	E	L	I	O	N
J	A	D	O	O	U	M	B	R	E	L	L	A	S	R	S	O	U	P	D
A	M	S	T	E	R	D	R	A	M	G	O	D	I	N	K	I	T	E	S
L	U	C	K	Y	M	S	E	O	A	S	D	F	F	G	H	J	K	K	L
A	B	C	D	Y	U	O	I	R	T	E	T	S	D	F	G	H	J	J	I
B	S	D	F	G	H	J	K	L	M	S	Q	W	E	E	R	T	Y	M	D
C	A	T	U	I	P	U	L	T	E	Q	W	E	C	V	B	N	A	J	E
D	A	E	I	O	U	A	E	R	I	O	U	A	B	C	R	N	O	O	A
T	Y	P	H	O	O	N	O	O	R	J	A	H	A	N	U	K	A	S	Z
E	S	T	O	P	O	F	V	E	R	S	I	D	A	S	T	B	I	N	Y
F	G	H	I	J	K	L	M	N	O	P	Q	R	T	S	T	U	V	W	X

## Chapter – 12

### FRICTION

Friction is defined as a contact force that opposes the -----

-----

-Friction depends on -----

-----

-----

--Friction arises because of -----

-----

-----

-----

--

#### **There are different types of friction-**

Static friction- is defined as -----

-----

-----

Sliding friction is defined as -----

-----

-----

-----

-

Rolling friction is defined as -----

-----  
-----

Fluid friction or drag-----

-----  
-----

Friction can be increased in the following ways in different situations-

Gymnasts rub mud on their palms to increase friction and have a better grip.

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-----  
-----  
-----  
-----

Friction can be decreased by-

Sprinkling boric powder on carom board.

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-----  
-----  
-----  
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-----

**“Friction is considered to be a necessary evil”-----**

**Friction is necessary for the following reasons-**

**Friction is an evil since ---**

It generates heat leading to energy wastage and minimisation of efficiency in machines.

-----  
-----  
-----

Sliding friction is smaller than static friction because-----

-----  
-----  
-----  
-----

**Streamlining** is a change in the shape of an object moving through a -----

to enable it to move easily with ----- friction.

Birds and fishes have evolved to have special shapes since-----

-----  
-----  
-----

### **BALL BEARINGS**

Ball bearings contain a set of balls between two metallic rings where the -----ring rotates easily while the -----ring is static. It can be used to support a rotating shaft that is fixed to the inner ring of a ball bearing.

**Draw a neat diagram to show a ball bearing.**

### FUN ACTIVITY

1. Make a straight track on ground for a battery operated toy car. Coat the track one by one with different materials like sand, paper, cardboard, stones, mud, etc. and move the car from one end of the track to another. In each case, measure the distance travelled by the toy car and the time taken to cover that distance.

Observation table

<u>Track material</u>	<u>Distance travelled</u>	<u>Time taken</u>	<u>Distance travelled/ time</u>
-----------------------	---------------------------	-------------------	---------------------------------

Sand

Paper

Cardboard

Stones/ mud

Conclusion :

### ACTIVITY 1

Aim – To determine the factors affecting friction.

Materials required – a block of wood with a hook, a spring balance, a sheet of glass/

cellophane sheet, a large sheet of coarse sandpaper, weights, two round pencils, and a large table.

Theory –

.....

.....

.....

---

**Method**

- 1. Pull the block of wood gently across the tabletop with the spring balance.**
- 2. Note down the reading on the spring balance. This tells you the force needed to pull the block.**
- 3. Place the sheet of glass or cellophane on the table and pull the block of wood over it. Note down the reading.**
- 4. Now place the sandpaper on the table, with the rough side up and pull the wooden block over it. Note down the reading on the spring balance.**
- 5. Finally, place the wooden block over the two round pencils and pull it with the spring balance. Again note the reading.**
- 6. Repeat the whole activity, with some weights over the wooden block on each type of surface. And note down the readings.**

**Observation table**

<b>Type of surface</b>	<b>Force in Newtons , required to just move the wooden block.</b>
<b>Tabletop</b>	
<b>Glass/ cellophane sheet</b>	
<b>Sandpaper</b>	
<b>Pencil as rollers</b>	

**Conclusion - (i) Friction depends on:**

**a.**

\_\_\_\_\_

**b.**-----

Name the forms of friction exerted, as seen in the given figures.



Sliding friction





## Chapter – 12

### FRICTION

#### ASSIGNMENT 12.1

1. Which of the following is not used to reduce friction?
  - (a) ball bearing
  - (b) lubricant
  - (c) air cushion
  - (d) saw dust
  
2. The cause of friction between two surfaces in contact is
  - (a) size of the object
  - (b) area of the surface of object
  - (c) roughness of surfaces in contact
  - (d) shape of the object
  
3. When two surfaces are rubbed against each other,
  - (a) heat is produced
  - (b) wear and tear takes place
  - (c) surfaces become smooth
  - (d) nothing happens
  
4. On decreasing the weight of an object, friction
  - (a) decreases
  - (b) increases
  - (c) remains unaltered
  - (d) vanishes
  
5. Streamlining reduces
  - (a) static friction
  - (b) sliding friction
  - (c) rolling friction
  - (d) fluid friction
  
6. Which of the following is not true about friction?
  - (a) It wears down an eraser
  - (b) It helps us to walk
  - (c) It helps a ship to sail through water
  - (d) It heats up our palms when rubbed.
  
7. The hinges of a creaking door are oiled to
  - (a) to keep them clean

- (b) to keep them rust free
- (c) to maintain their shine
- (d) to reduce noise and wear and tear

8. The easiest way to shift a heavy carton from one place to another is

- (a) tie it with rope and pull
- (b) ask more labourers to push it
- (c) Put it on trolley
- (d) Split it up into parts

9. A car skids on a wet road because

- (a) water increases the friction between road and tyres
- (b) water decreases the friction between road and tyres
- (c) it is not possible to apply brakes on wet road
- (d) brakes are ineffective on wet road

10. It is not possible to open a bottle's lid with oily hands because due to friction

- (a) surface becomes sticky
- (b) surface becomes rough
- (c) surface becomes smooth and slippery
- (d) none of these.

Circle the odd one out and justify scientifically:-

1. oil, grease, sand, graphite, powder
2. sole of shoe, tyre of car, surface of road, oily hands
3. ball bearing, trolley, bags with rollers, wooden box, toy car

Answer the following questions:-

1. What is meant by fluid friction. How is it minimized?

-----  
-----  
-----  
-----

2. State two factors on which force of friction depends?

-----  
-----

3. Why is static friction maximum?

4. State whether presence of friction is helpful or troublesome, as seen in the following pictures. Justify your answers.



## Chapter – 12

### FRICTION

#### ASSIGNMENT 12.2

1. Name the two surfaces between which friction plays the role in the following cases:-
  - a. A boy slips on stepping on a banana peel.

- b. A student writes, using a chalk, on a board
  - c. A man turns the lid to open a bottle.
  - d. The screw remains gripped to the wall.
2. Fill in the blanks with an appropriate lubricant used in each of the following cases :-
- a. Asha removes her bangles easily by applying \_\_\_\_\_ on her hands.
  - b. Rashi puts some \_\_\_\_\_ on the carom board.
  - c. Piyush applied \_\_\_\_\_ on the chains of his bicycle to prevent wear and tear.
  - d. \_\_\_\_\_ in our mouth helps us to swallow food.
3. Wear and tear due to friction depends on two factors. What are they?
4. Imagining that friction is non-existent, write down or draw two or three situations that will make our life difficult?

**Chapter – 12**

**FRICTION**

**Assignment 12.3**

**Give reasons for the following :-**

- a. Aircrafts and ships have pointed fronts.

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- b. The shafts of rotating machines are mounted on ball bearings.

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- c. A piece of chalk gets smaller on repeated use.

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- d. It is easier to stir a glass of water as compared to a glass of honey.

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- e. It is difficult to put a loaded cart in motion than to maintain its motion.

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- f. A large sized brake on a bicycle is as effective as a small brake provided material of brakes remain same.

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- g. The handles of a motorcycle are covered with a rubber sheet with spikes.

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## Chapter – 12

### FRICTION

#### Assignment 12.4

1. In which direction is frictional force applied with respect to the motion of an object?
2. Which is easier – to move a box from rest or to move it when it is already in motion? Justify your answer.
3. What are the effects of friction?
4. Mention two ways each of (a) increasing friction (b) decreasing friction.
5. Fill in the blanks with words 'increase' or 'decrease':-
  - a. The treaded tyres of trucks \_\_\_\_\_ the friction between the tyres and the ground.
  - b. Gymnasts apply a coarse substance in the hands to \_\_\_\_\_ the friction for better grip.
  - c. Kabaddi players rub their hands with soil to \_\_\_\_\_ friction for better grip.
  - d. Fine powder is sprinkled on carom board to \_\_\_\_\_ the friction.
  - e. A motor mechanic uses grease between moving parts of machines to \_\_\_\_\_ the friction.
  - f. The use of lubricants \_\_\_\_\_ friction.
6. What are the factors on which fluid friction depend?
7. Mention three situations where friction is undesirable.
8. On what principle do ball bearings work?

#### H.O.T.S

**Maglev trains move without touching the ground and hence face no friction due to the ground. What does Maglev stand for? Name the form of friction experienced by them?**



**Chapter – 17**

**STARS AND THE SOLAR SYSTEM**

**Assignment 17.1**

1. Rewrite the following statements correctly:-

a. Halley’s comet is seen after every 76 centuries.

b. Helium gas constitutes most of the sun and other stars.

c. The unburnt part of meteor, which reaches the earth, is called meteoroid.

d. Asteroids are present between orbits of Saturn and Jupiter.

e. Earth is the fourth planet from the Sun.

2. Match the following:- Pick up the correctly matched word from column B and write them in the second column.

<b>Column A</b>		<b>Column B</b>
Stars		Hunter
Constellation		Long tail
Orion		Spins sideways
Comets		Pole star
Uranus		Galaxy
Milky way		Jupiter
Polaris		Ursa major

Giant planet		Twinkle
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3. Answer in one word:-
- a. Name the comet which is expected to be seen in 2062 from earth.
  - b. Name the nearest planet from the sun
  - c. Name the star which does not appear to move from earth.
  - d. Name the constellation which resembles a distorted W or M.
  - e. Name the planet having the special feature- the great red spot.
  - f. Which planet is also called the red planet?
  - g. Name the planet with only one moon.
  - h. Name the two planets that rotate from east to west.
  - i. Name the planet that is hidden most of the time in the glare of the sun.
  - j. Name the constellation that helps in locating the brightest star, Sirius.
  - k. Name the heavenly body which revolves around a planet.
  - l. What are meteors commonly known as?
  - m. Can we hear on the moon? Justify your answer?
4. What are the characteristic features of inner planets?
5. What are the characteristic features of outer planets?
6. How will you identify a comet in the night sky?
7. Name one constellation each seen in summers and winters.
8. Draw neat figures using a pencil, to show the following constellations-

Great Bear

Orion

Cassiopeia

## Chapter – 17

### STARS AND THE SOLAR SYSTEM

#### Assignment 17.2

1. What are celestial bodies? Name any three celestial bodies.
2. Name a star which appears stationary from the earth.
3. Why is Venus the brightest planet?
4. Distinguish between star and shooting star.
5. Why do comets have a long bright tail?
6. Why does the sun appear to move from east to west?
7. How can we locate pole star in the night sky?
8. Circle the odd one out and justify your answer:-
  - a. Ursa Major, Cassiopeia, Pole star, Orion, Scorpio
  - b. Stars, moon, planets, comets, clouds
9. Name the planets which can be seen with naked eye.
10. Draw the constellation 'Orion' and write a short note on it.
11. 'The brightest star Sirius is 8.7 light years from the earth'. What does this statement mean?
12. What are the characteristic features of earth which makes life possible on earth?
13. What are the practical applications of artificial satellites?
14. Name some satellites which have been launched by India.
15. Which is the latest satellite launched by India?

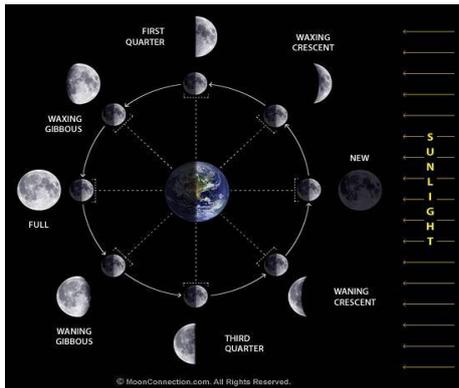
## CHAPTER 17

### STARS AND SOLAR SYSTEM

#### Assignment 17.5

Draw the phases of moon as shown below, on the right hand side of the fig and fill in the blanks with appropriate words:-

Diagram of the Phases of the moon



The various shapes of the bright part of the moon as seen during a month is called the \_\_\_\_\_ of moon. The time period between one full moon and the next full moon is slightly longer than 29 days. The moon is not self luminous. It is visible to us since it \_\_\_\_\_ the light of the sun. Only that part of the moon from which sunlight is reflected towards us is visible to us.

Since the moon revolves around the \_\_\_\_\_ and the earth revolves around the \_\_\_\_\_ the relative positions of the sun, moon and earth keep changing. The moon completes one \_\_\_\_\_ around the earth (29.5 days).

As the moon revolves around the earth, we are able to see only the part of the moon which is \_\_\_\_\_ by the sun and is towards us.

When the rays of the sun fall directly on the moon and the moon is seen as a full disc of light, it is called \_\_\_\_\_.

As the moon revolves around the earth, the illuminated part of the moon that faces the earth keep reducing gradually from \_\_\_\_\_ to half moon to \_\_\_\_\_ moon until the part of the moon facing the earth becomes completely dark and is called \_\_\_\_\_. This phase where there is a gradual \_\_\_\_\_ in size of the visible part of the moon is called the \_\_\_\_\_ phase or Krishna Paksha.

Once again, after new moon, the size of the illuminated part of the moon visible from the earth increases from \_\_\_\_\_ to Half Moon to \_\_\_\_\_ moon and finally the Full Moon. This

phase where there is a gradual \_\_\_\_\_ in the size of the visible part of the moon as seen from the earth is called the \_\_\_\_\_ Phase or Shukla Paksha.

### Question Bank for Recapitulation

1. Name the forces exerted, as seen in the given pictures. Also state whether they are contact or noncontact forces?



2. Observe the pictures and answer in columns -Agent exerting the force, Object on which it acts, effect of the force.



3. Write in activity format, an activity to show that Pressure in a liquid increases with depth?

**Aim:** To show that pressure exerted by liquids increases with depth.

**Materials Required:** Mineral water bottle, compass/needle, water

**Theory:**

**Diagram:**

**Procedure:**

1. Take a bottle and pierce 3 holes at different heights along the same vertical line.
2. Paste a cello tape over the holes.
3. Fill it up with water
4. Now peel off the cellotape.
5. Observe what happens.
6. Observe the distance between the bottle and the different points on which, the stream of water falls.

**Observation:**

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**Conclusion:**

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4. List down three possible effects of force exerted on an object?

5. Calculate the force by a pile of books that exert a pressure of 225 Pa on a surface of area 25sqm?

6. Explain giving scientific reasons.- ( Write down these answers and practise.)

- a. We are not crushed under the weight of the air above us.
- b. A balloon bursts as it goes high in the air.
- c. Shoulder bags are provided with wide straps.
- d. The pillars of bridges and flyovers have a broad base.
- e. A fruit can be cut into thin slices using a sharp knife.
- f. Porters place a round piece of cloth on their heads.
- g. The foundation of a high rise building is wide.
- h. Tools meant for cutting and piercing have sharp edges.
- i. People living in plains suffer from nose bleeding as they go to high altitudes.
- j. It is easy to convenient to pull luggage fitted with rollers.
- k. Ball bearings are used between hubs and axles of ceiling fans.
- l. The shape of an aeroplane resembles that of a bird.
- m. It is difficult to tie a knot in a silk thread.
- n. The moving parts of machines are oiled from time to time.
- o. Wheels of automobiles are made circular.
- p. Grooves are made in the tyres of vehicles.

Fill up the blanks after rewriting the sentences.

- a. Three forces that can act from a distance are \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.
- b. Force per unit area is called \_\_\_\_\_.
- c. If the same force is made to act on a larger area, the pressure \_\_\_\_\_.
- d. Pressure in a liquid \_\_\_\_\_ as the depth increases.
- e. How can the brightest star, Sirius be located in the night sky?

- f. Give three differences between planets and stars.
- g. Why does Uranus appear to roll on its sides?
- h. Mention three applications of artificial satellites?

**Answer very briefly-**

1. Name the brightest object in the night sky.
2. Give one word for the celestial object revolving around the sun,
3. In which direction does the earth rotate?
4. What is the total number of planets in the solar system?
5. Which is the nearest star from us?
6. What is the main source of heat and light for all planets? What happens to the period of revolution of the planets as the distance of the planet increases from the sun?
7. Name the only natural satellite of the earth.
8. Name the planet nearest to the sun.
9. Which planet appears yellowish in colour?
10. Which is the planet whose density is less than that of water?
11. Which planets are also called outer planets?
12. Name the four planets which are called inner planets.
13. Which planet appears to roll on its sides.
14. Name the only planet where life is known to exist.
15. What is the common feature between Uranus and Venus?
16. Name the planet which can be seen only with large telescopes?
17. Which planet is often called the morning or evening star?
18. Which planet is also called the Red Planet?
19. Which is the brightest planet in the night sky?
20. Which is the smallest planet of the solar system?
21. Which is the largest planet of the solar system?
22. Which planet can float on water?

23. Which planet has two moons?
24. Which planet is mostly hidden in the glare of the sun?
25. Which planet shows phases just like that of moon?
26. Which planet is often seen near the horizon just before sunrise or after sunset?
28. Name and draw neat labelled figures to show two constellations?
29. Determine the resultant force acting on an object if the pushing force is 28.5N and the pulling force is 22.2 N?
30. Define-  
Muscular force, 1 Pascal, Static friction, Constellation, Drag.

**TERM – 2**  
**CHAPTER 16**

**LIGHT**

**ACTIVITY 1- LAB ACTIVITY**

**Aim:** To verify the laws of reflection.

**Materials Required:** Plane mirror, wooden board, sheet of white paper, laser torch, pencil, protractor

**Theory:** The two laws of reflection are:-

1. The angle of incidence is always equal to the angle of reflection
2. The incident ray, the normal at the point of incidence and the reflected ray, all lie in the same plane.

**Diagram:**

**Procedure (Write in steps, after observing the demonstration)**

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**-Observation Table:**

S No	Angle of incidence	Angle of reflection

**Conclusion:**

1. -----

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2. The incident ray, the normal and the reflected ray meet at \_\_\_\_\_

## Chapter 16

### LIGHT

#### ACTIVITY 2

**Aim:** To show dispersion of light

**Materials Required:** Prism, white light/ sunlight, screen

**Theory:** The phenomenon of splitting of white light into its constituent colours is known as dispersion.

**Diagram:**

**Procedure:**

1. One of the non-parallel face of the prism is focused towards sunlight at an angle and is held at the position.
2. Observe the screen placed on the opposite side.

**Observation:**

**Conclusion:** Sunlight splits into \_\_\_\_\_.

Name a natural optical phenomena that is seen due to dispersion of light-----

Define Spectrum-----  
-----  
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## CHAPTER 16

### LIGHT

#### ACTIVITY 3.

**Aim :** To view multiple images

**Materials Required:** 2 plane mirrors, 1 pencil or sketch pen, a white sheet of paper, wooden board

**Theory:**

**Procedure:**

1. Place the paper on the wooden board.
2. Draw a horizontal line on it and mark its centre as O
3. From O, draw a perpendicular to the horizontal line.
4. Place a pencil on the vertical line.
5. Place 2 plane mirrors on both sides of the pencil with the edges of mirrors touching O at different angles.
6. Each time the mirrors are placed at an angle, count the number of images formed.
7. Repeat this for 3-4 times.
8. Now place the mirrors parallel to each other and count the number of images formed.

**Diagram .**      **Read the steps in the Procedure and draw the figure.**

**Observation:**

S No	Angle between the mirrors.	Number of images
1		
2		
3		
4		

**Conclusion:**

## Chapter – 16

### LIGHT Assignment 16.1

1. Fill in the blanks :-
  - a. The \_\_\_\_\_ nerve carries the impression on the retina to the brain.
  - b. The image formed by a plane mirror is \_\_\_\_\_ inverted.
  - c. Cataract is the condition that affects the \_\_\_\_\_ of the eye.
  - d. We get \_\_\_\_\_ images with two plane mirrors placed parallel to each other.
  - e. The normal makes an angle of \_\_\_\_\_ with the surface of the plane mirror.
  - f. The light sensitive cells on the retina are called \_\_\_\_\_.
  - g. The colour of the eye is due to \_\_\_\_\_.
  - h. The impression of an image persists for \_\_\_\_\_ of a second.
  - i. Cataract effects the \_\_\_\_\_ of human eye.
  
2. Give one word for the following:-
  - a. A kind of reflection in which reflected rays travel parallel to one another.
  - b. A reflection taking place from the walls of a room.
  - c. Phenomenon of splitting of white light by a plane mirror immersed in water at an angle of  $45^\circ$ .
  - d. A special script designed for reading for visually challenged people.
  - e. This part of eye acts as window to the world.
  - f. Light sensitive screen at the back of eye where image is formed.
  - g. Its function is to carry optical messages to the brain.
  - h. Its function is to alter the focal length of the crystalline lens.
  - i. It determines the colour of the eye.

**Chapter – 16**

**LIGHT**

**Assignment 16.2**

1. What is cataract? How is it treated?

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2. Mention 3 important measures to ensure proper eye care.

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3. Why is the blind spot so called?

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4. If a ray strikes at an angle of 44 degrees with a reflecting surface, what will be the angle of reflection. Draw a figure to show the same.

5. If the angle between the incident and reflected ray is 85 degrees, determine the angle of reflection. Draw a figure to show the same.

Complete the following table-

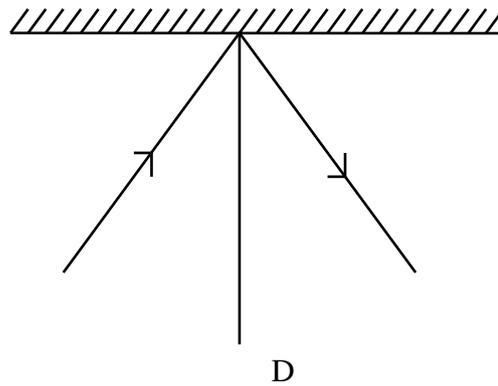
<b>Part of the human eye.</b>	<b>Description and Functions</b>
Cornea	It is the front transparent membrane of the eye. It permits light into the eye and causes maximum refraction of the light rays.
Iris	
Pupil	
Eye lens	
Ciliary muscles	
Retina	
Optic nerves	
Blind spot	

**CHAPTER 16**

**LIGHT**

**Assignment 16.3**

1. A ray of light AB strikes a plane mirror MM' at B and is reflected along BC as given in the figure. Complete the following sentences:-

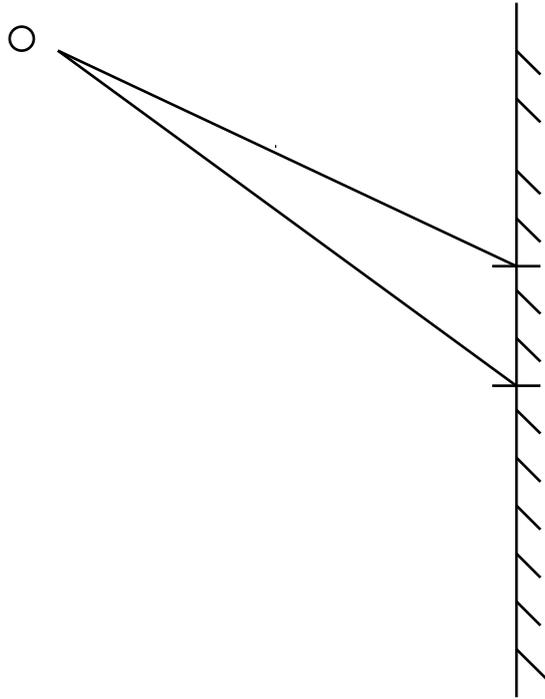


- a. The ray AB which strikes MM at B is called \_\_\_\_\_.
- b. The bounced ray BC from B is called \_\_\_\_\_.
- c. The line BD which is perpendicular to MM' is called the \_\_\_\_\_.
- d. The angle between AB, \_\_\_\_\_ and BD, \_\_\_\_\_ is called the \_\_\_\_\_.
- e. The angle between BD, \_\_\_\_\_ and BC, \_\_\_\_\_ is called the \_\_\_\_\_.

State the laws of reflection of light?

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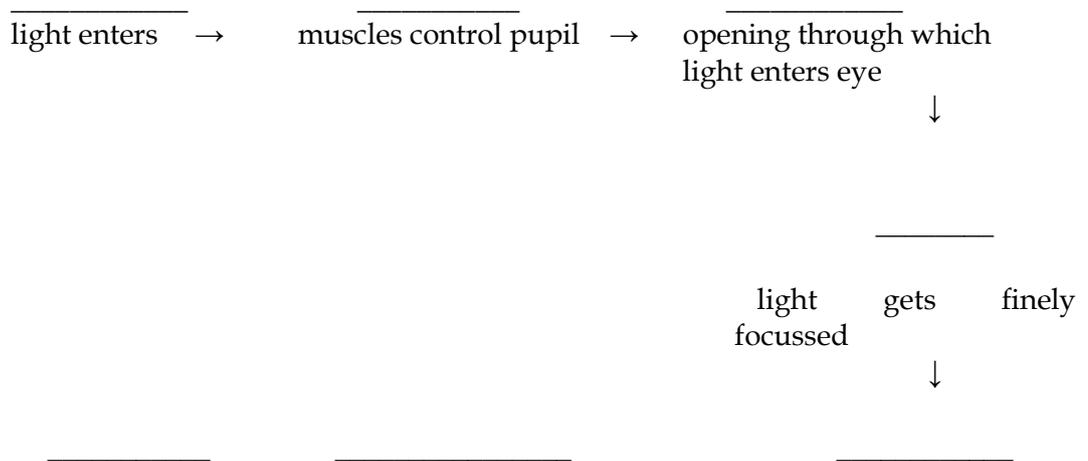
2. Complete the following ray diagram to show the image formed by a plane mirror of a point object and write down the characteristics of the image formed:-



Characteristics of the image formed by a plane mirror:-

- i.
- ii.
- iii.
- iv.
- v.

3. Name the parts of human eye and complete the following:-



Decodes message ← carries sensation to brain ← inverted image is formed on retina

## CHAPTER 16

### LIGHT

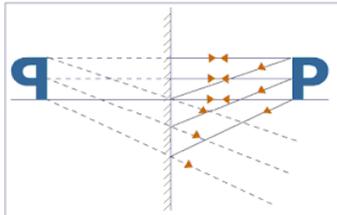
#### Assignment 16.5

1. Which characteristic of image formed by plane mirror is shown in each of the following figures:-



(a)

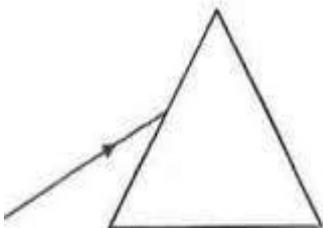
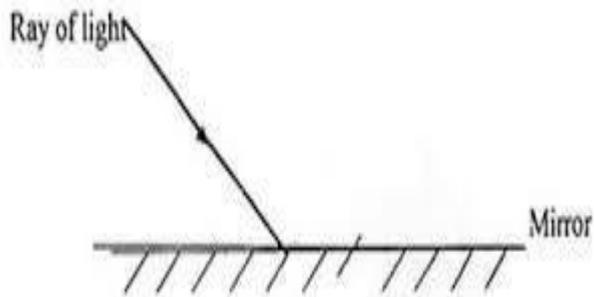
\_\_\_\_\_



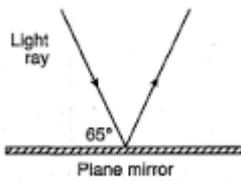
(b)

\_\_\_\_\_

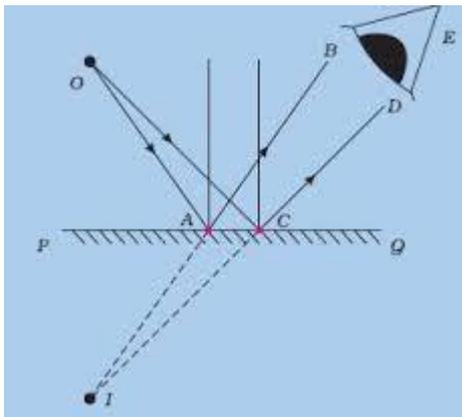
1. Complete the following figures, label it and write the key on its right:-



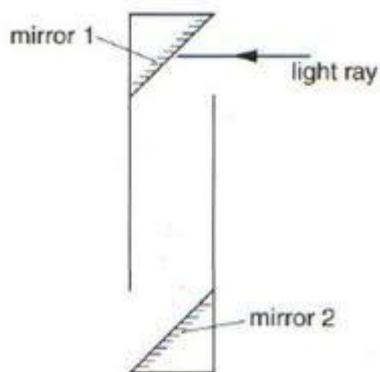
2. In the given figure, calculate the angle of reflection.



3. What does the ray diagram represent? Write its key.

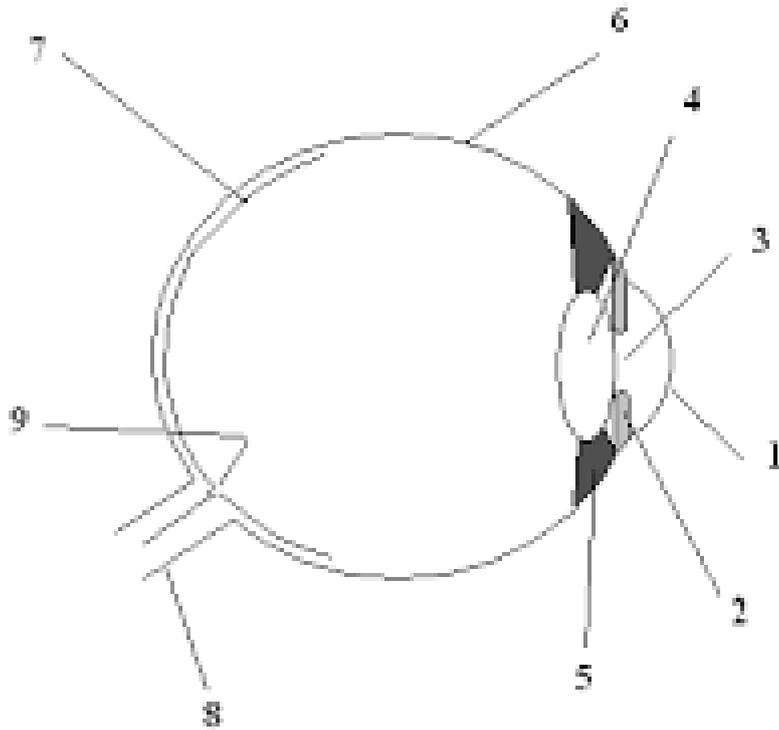


4. Draw the reflected ray from the mirror 2 and complete the diagram. This alignment of plane mirrors is used in which device? Mention one application of this device?

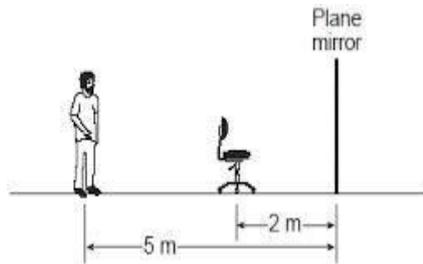


**CHAPTER 16**  
**LIGHT**  
**Assignment 16.6**

1. Label the diagram of human eye:-

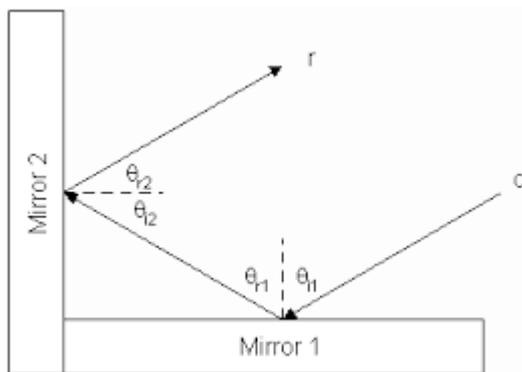


2. Answer the following questions:-



- (a) What is the distance between man and chair?
- (b) What is the distance between the chair and its image?
- (c) What is the distance between the man and his image?
- (d) What is the distance between the image of chair and the mirror?
- (e) What is the distance between the image of man and the mirror?
- (f) What is the distance between the image of man and image of chair?

3. If the angle of incidence in mirror 1 is  $70^\circ$ , find the angle of reflection in mirror 2.



**H.O.T.S.**

**Oil spilled from a vehicle on a wet road after rainfall appears coloured. Why?**

**Most of the light reflected from objects around us is due to diffused reflection. What would happen if all objects around us are plane, smooth and highly polished?**

**We know that angle of incidence is equal to angle of reflection for a plane mirror. Is this true for curved polished surfaces?**

**Louis Braille** - As a small child, he was blinded in an accident; as a boy he developed a mastery over that blindness; and as a young man – still a student at school – he created a revolutionary form of communication that transcended blindness and transformed the lives of millions.

After two centuries, the braille system remains an invaluable tool of learning and communication for the blind, and it has been adapted for languages worldwide.

The 200th anniversary of Braille's birth in 2009 was widely celebrated throughout the world by exhibitions and symposiums about his life and achievements. Belgium and Italy struck 2-euro coins, India struck a 2 rupee coin, and the USA struck a one dollar coin to mark the event.

**Enlighten yourself about the following facts.**

### **The Differences Between the Human Eye & a Camera Lens**

The human eye and a camera lens have a few things in common, most notably that they both use a converging lens to receive and project images. But human eyes and camera lenses have many things that set them apart from each other.

#### **Retina Provides Color**

- The image an eye perceives is projected from the cornea to the retina, which absorbs the image and projects it to the brain. A camera projects an image on to film where it is captured and saved as a black and white image. The retina contains millions of cones that provide the image with color.

#### ***Stereoscopic View***

- The biggest difference between eyes and a camera lens is that two eyes give us stereoscopic vision. This allows our eyes to project a more detailed image to the brain than a single camera lens and provide depth of field, something a single camera lens can't do.

#### ***Light Sensitivity***

- A camera lens projects an image onto film that has chemicals with a uniform sensitivity to light. The eye project images on to the retina that has rods with varying capacities to absorb light.

#### ***Light Adjustment***

- The human eye controls how much light it receives by reducing and enlarging the size of the pupil. A camera lens has to be adjusted to receive the proper amount of light.

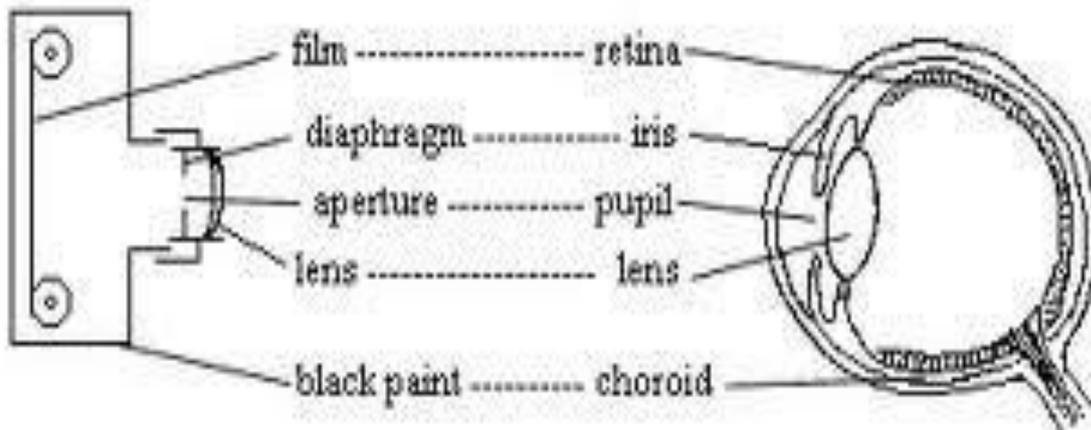
#### ***Cameras Have no Blind Spot***

- The human eye has a "blind spot" located where the optic nerve leaves your eye and connects to the brain. At that connection point, the eye can't see anything. A camera lens doesn't have a connecting point like this and has no blind spot.

## Similarities Between the Eye and the Camera

*First of all, both of them have an opening at the centre for light to enter; aperture for the camera and a pupil for the eye. The camera has a diaphragm to control the size of the aperture (to control the amount of light entering camera/eye) while the eye has iris muscles to control the size of the pupil. Cornea is the main part of the eye (included are lens, aqueous and vitreous humor) that functions to refract light as a glass biconvex does in the camera. Photosensitive chemicals on film (camera) and photoreceptors in the cornea (eye) are the objects of light action to form image. The last similarity is that they both absorb excessive light to prevent multiple images formation using a dark internal surface in the camera and a pigmented, dark choroid in the eye.*

*Structural comparison between human eye and a camera*



## Chapter - 13

### SOUND

#### ACTIVITY 1

**Aim :** Sound is produced by a vibrating body.

**Materials required :**

**Theory:**

**Diagram :**

**Procedure:**

1. Strike the tuning fork on the rubber pad and bring it close to your ear.
2. Strike it again on the rubber pad and touch the surface of water kept in the beaker with one of its prongs.

**Observation :**

1. When the tuning fork is brought close to the ear, \_\_\_\_\_
2. When the prongs of the tuning fork is allowed to touch the surface of water, \_\_\_\_\_.

**Conclusion :** \_\_\_\_\_.

- Rapid to and fro or back and forth motion of an object is called **vibration**.

Identify the musical instruments shown in the pictures and state the vibrating part of the instrument.

Name of instrument

Vibrating part

1.



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2.



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3.



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4.



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5.



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6.



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7.



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8.



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9.



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10.



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11.



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## Chapter - 13

### SOUND

**Try this activity at home yourself and jot down your observations.**

**Aim :** Sound needs a material medium to propagate

**Materials Required :** Metal glass with narrow mouth, mobile / bell

**Theory:**

**Diagram:**

**Procedure :**

1. A ringing mobile is kept inside the glass and is heard.
2. Air inside the glass is sucked out with the ringing mobile still inside and heard.

**Observation :**

1. The sound of the ringing mobile is \_\_\_\_\_ when it is kept inside the glass.
2. When air is sucked out slowly from the glass, \_\_\_\_\_  
\_\_\_\_\_.

**Conclusion :** \_\_\_\_\_.

**Note :** If the air is sucked out completely, vacuum will be created inside the glass and the sound of the ringing mobile will not be heard at all as sound does not travel through vacuum.

## Chapter – 13

### SOUND

#### Assignment 13.1

1. How is sound produced by humans?

In humans, sound is produced by the organ called \_\_\_\_\_ or larynx. It is located at the upper end of the \_\_\_\_\_. Inside the voice box, \_\_\_\_\_ vocal cords are stretched across such that it leaves a narrow slit between them for the passage of air. When the lungs force air through the slit, the vocal cords \_\_\_\_\_ producing sound.

\_\_\_\_\_ of sound produced depends on whether the -----are tight or loose. Muscles attached to the vocal cords can make them tight or loose. The sound is further modulated by the air chamber of mouth and nose.

#### Some points to remember:-

- Sound travels \_\_\_\_\_ in gases, faster in liquids and \_\_\_\_\_ in solids.
- Sound \_\_\_\_\_ travel through vacuum.
- Speed of sound in ----- is 340 m/s approximately. It changes with atmospheric conditions like temperature, atmospheric pressure, humidity, etc.
- Speed of light in air/vacuum =  $3 \times 10^8$  m/s

#### Characteristics of sound

1. **Loudness** – It depends on the \_\_\_\_\_ of vibrations. Large amplitudes produce loud sounds whereas small amplitudes produce soft sound.
2. **Pitch** – Pitch of a note depends upon the \_\_\_\_\_ of the sound. A high pitch sound has high frequency and vice versa.

High pitch » high frequency » sharp, shrill voice. Eg. Women 's voice

Low pitch » low frequency » heavy, hoarse, blunt voice. Eg. Men's voice

## **Musical Instruments**

They are classified into three types depending on the kind of vibrations produced.

1. **Stringed instruments** – Vibrations in the \_\_\_\_\_ produce sound. The frequency of vibration is changed by changing the thickness, tightness and length of the wires. Eg – Guitar, *sitar*, violin, *sarod*, *veena*, etc.
2. **Wind instruments** – Vibrations in \_\_\_\_\_ produce sound. The frequency of vibration is changed by changing the length of vibrating air columns. Eg – Flute, mouthorgan, clarinet, *shehnai*, etc.
3. **Percussion instruments** – Vibrations of the \_\_\_\_\_ produces sound. The frequency of vibration can be increased by stretching the membrane more. The loudness can be increased by striking the membrane harder. Eg – Tabla, drum, mridangam, etc.

**Music** – 1. Regular vibrations produce musical sound

2. Soothing, pleasant, refreshing

**Noise** – 1. Irregular vibrations produce noise

2. Irritating, unpleasant, tiring

**H.O.T.S.**

**When can music become noise?**

## Chapter – 13

### SOUND

#### Assignment 13.2

Multiple choice questions:-

1. Sound travels fastest in
  - (a) air
  - (b) water
  - (c) vacuum
  - (d) solids
  
2. Decibel is the unit to measure
  - (a) pitch
  - (b) frequency
  - (c) loudness
  - (d) quality
  
3. The SI unit of frequency is
  - (a) second<sup>-1</sup>
  - (b) hertz
  - (c) mega hertz
  - (d) decibel
  
4. Which of the following frequency of sound is inaudible?
  - (a) 50 Hz
  - (b) 500 Hz
  - (c) 5000 Hz
  - (d) 50000 Hz
  
5. The minimum distance between the source of sound and reflecting surface to produce an echo is
  - (a) 22.6 m
  - (b) 11.3 m
  - (c) 10 m
  - (d) 17 m
  
6. Sound having frequency less than 20 Hz are called
  - (a) ultrasonic
  - (b) supersonics
  - (c) infrasonic
  - (d) SONAR
  
7. In sitar, sound is produced by
  - (a) beating
  - (b) blowing
  - (c) rubbing
  - (d) plucking
  
8. A stretched rubber band vibrates 500 times in 5 seconds. Its frequency is

- (a) 10 Hz
- (b) 100 Hz
- (c) 1000 Hz
- (d) 500 Hz

9. The rapid to and fro motion of an object is called

- (a) periodic motion
- (b) oscillation
- (c) vibration
- (d) both (a) and (c)

10. Curtains, cushions, rugs, etc are \_\_\_\_\_ of sound

- (a) poor absorbers and good reflectors
- (b) good absorbers and poor reflectors
- (c) only good reflectors
- (d) only good absorbers

Complete the following table:-

<b>S No</b>	<b>Source</b>	<b>Louder</b>	<b>Shriller</b>
1.	Drum or guitar		
2.	Roar of lion or tweeting of bird		
3.	Voice of female or male		
4.	Crying baby or shouting man		

## Chapter – 13

### SOUND

#### Assignment 13.3

1. Fill in the blanks:-
  - a. A rapid back and forth movement of a body about a mean position is called \_\_\_\_\_.
  - b. The pitch is determined by the \_\_\_\_\_ of the vibrating body.
  - c. Sound cannot travel through \_\_\_\_\_.
  - d. Sound travels \_\_\_\_\_ than light.
  - e. Vibrations of frequency less than 20 Hz are called \_\_\_\_\_.
  - f. The number of vibrations completed in 1 second is called \_\_\_\_\_.
  - g. The unpleasant and irritating sounds are called \_\_\_\_\_.
  - h. The shrillness of sound depends upon \_\_\_\_\_.
2. Classify the sound produced by the following into high pitched and low pitched:-

a. man	b. child	c. bird
d. frog	e. woman	f. whistle
g. thunder	h. mosquito	i. drum
j. flute	k. jet plane	
3. State whether the following statements are true or false. If false, write down the correct statement.
  - a. The audible range of frequency is 20-20,000 Hz.
  - b. The louder the sound, the lesser is the amplitude of a vibrating body.
  - c. A medium is not necessary for the propagation of sound.
  - d. Time in which the vibrating particle completes one vibration is called the time period.
  - e. Loudness and duration of a sound determines the amount of noise pollution.



## Chapter – 13

### SOUND

#### Assignment 13.4

1. Name the state of matter in which sound travels
  - a. the fastest
  - b. the slowest
2. Name the instrument used in the laboratory to produce sound of fixed frequency.
3. What is the role of ear drum in hearing?
4. What is the unit in which loudness of sound is measured?
5. In space, astronauts use radios to talk to each other. Why?
6. On the basis of production of sound, what is the difference between birds which chirp and bees that buzz?
7. Circle the odd one out and justify your answer:-
  - a. amplitude, frequency, time period, Hertz
  - b. Violin, bursting cracker, electric drill, honking vehicle
  - c. bats, dogs, human beings, deers, monkeys
8. How is the voice of a 5 year old child different from the voice of a 25 year old man?

#### Characteristics of vibration / oscillation

**Amplitude** : The maximum displacement from the mean position is called the amplitude. Its SI unit is metre (m).

**Time – period (T)** : Time taken to complete one oscillation / vibration is called the time period. Its SI unit is **second (s)**.

**Frequency (f)** : Number of oscillations in 1 second is known as frequency. Its SI unit is **Hertz (Hz)**.  
Relationship between  $f$  and  $T$

$$f = 1 / T$$

## Chapter – 13

### SOUND

#### Assignment 13.5

1. If the frequency of a vibrating particle is 5 Hz, how many vibrations it makes in 1 s?
2. If an object completes 5 vibrations in 1 s, what is its time period?
3. An object completes 800 vibrations in 20 s. Calculate its frequency.
4. Calculate the time period of a vibrating particle whose frequency is 20 Hz.
5. What is the frequency of a vibration, if the time taken by 650 vibrations is 13 s?
6. Find the frequency of vibration if its time period is 0.04 s.
7. What is the frequency of an object which oscillates 25 times in one second?
8. Calculate the time period of a pendulum whose frequency of oscillation is 2 Hz.
9. Calculate the frequency of a pendulum whose time period is 3s

#### ACTIVITY

##### [LET US DO]

Collect pictures showing the major sources of noise pollution and create a neat collage of the same. Write a brief catchy slogan in Hindi or English on “Creating awareness about harmful effects of noise pollution”.

#### H.O.T.S

**Extreme loud sounds can make one deaf. Explain why?**

**The wires of a guitar are of different thickness. Why?**

## Chapter – 13

### SOUND

#### Assignment 13.6

1. Complete the following table:-

S No	Musical instrument	Vibrating part producing sound	Type of instrument
1	Veena		
2	Tabla		
3	Flute		
4	Ektara		
5	Sarod		
6	Guitar		
7	Violin		
8	Jaltarang		
9	Sitar		
10	Drum		
11	Whistle		

2. State whether the following produce sound of ‘high pitch’ or ‘low pitch’:-  
Drum, baby, man, woman, bird, lion, whistle
3. Suggest 5 measures which can minimize noise pollution in a residential area.
4. What are the harms caused by noise pollution?
5. How can a musical sound be different from a noise?
6. What is the audible frequency for human ear?
7. How is loudness of a sound related to amplitude?
8. How do astronauts communicate in space?

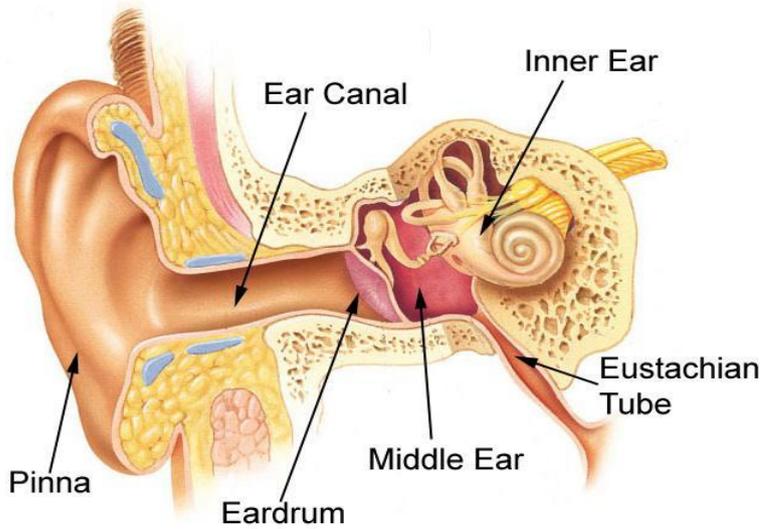
**Chapter – 13**

**SOUND**

**Chapter – 13**

**SOUND**

2. Observe and study the parts of the Human ear.



Draw a table and enlist the name and the corresponding functions of the human ear.

2. How do we hear sound through our ears?

The \_\_\_\_\_ part of the ear channels vibrations down to a thin membrane called \_\_\_\_\_ which is stretched very tightly. The eardrum then begins to \_\_\_\_\_ and the vibrations are passed on to \_\_\_\_\_ tiny bones (the hammer, the anvil and the stirrup) in the \_\_\_\_\_ ear. From here, the vibrations are passed on to the \_\_\_\_\_ ear. The inner ear consists of a 34 cm long coiled tube called the \_\_\_\_\_. It is filled with fluid and contains cells with hairs. These hair cells are very \_\_\_\_\_ to vibrations. The vibrations are transmitted by the \_\_\_\_\_ nerve to the brain to register \_\_\_\_\_.

## Chapter – 14

### CHEMICAL EFFECTS OF ELECTRIC CURRENT

#### ACTIVITY 1 (to be done in the laboratory)

**Aim:** To test the conductivity of the given liquids

**Materials Required:** Beakers, liquid sample, bulb, key, wires

**Theory:** When the two free ends of the wire of the circuit are dipped in a liquid, the bulb glows if the liquid is an electrolyte.

**Diagram:**

**Procedure:**

1. Fill the beakers with the liquid samples given.
2. Make the connections as shown in the figure.
3. Clean the free ends of wire every time and dip in the liquid samples.

**Observation:**

S No	Name of the liquid	Bulb glows (yes/no)	Electrolyte (yes/no)
1			
2			
3			
4			
5			
6			
7			

**Conclusion:**-----

-----

## **ACTIVITY 2**

**[LET US DO]**

**Aim – To study the chemical effects of current**

### **Procedure 1**

Take tap water acidified with a few drops of dil. sulphuric acid in a beaker and connect it to the tester and observe for few minutes.

**Fig.**

### **Observation**

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### **Procedure 2**

Take a metallic blade or key. Connect it to the negative terminal of a circuit whose positive terminal is connected to a copper electrode. Immerse both the electrodes into a solution of copper sulphate. Switch on the circuit and observe after 1-2 minutes.

**Fig.**

**Observation**

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**Procedure 4-** A potato is taken and cut into two halves. The two ends of a copper wire connected to a simple circuit are inserted to the cut ends of the potato. The circuit is switched on and left for 25-30 minutes. What do you observe? Explain your observation.

**Figure**

**Observation**

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**Conclusion**

These are some of the chemical effects of electric current.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

Define electroplating? Name two electroplated articles in the kitchen.

-----  
-----  
-----

What are the advantages of Chromium plating?

-----  
-----  
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## Chapter – 14

### CHEMICAL EFFECTS OF ELECTRIC CURRENT

#### Assignment 14.1

1. Answer in one word.
  - a. Positively charged ions which get attracted to the negative electrode.
  - b. Apparatus in which electrolysis is carried out.
  - c. Process of depositing a thin layer of metal on another with the help of electricity.
  - d. A solution that conducts electricity.
  - e. Metal rods/plates through which current enters or leaves an electrolyte.
  
2. Fill in the blanks.
  - a. Water mixed with salts is a \_\_\_\_ conductor of electricity.
  - b. Impurities in water generally \_\_\_\_\_ its conductivity.
  - c.  $\text{Cl}^-$  is a \_\_\_\_\_.
  - d. The flow of conventional current is in the \_\_\_\_\_ direction to the flow of electrons.
  - e. Electrolysis occurs when electrolyte is in the \_\_\_\_\_ state.
  - f. In electrolysis of water, hydrogen is formed at the \_\_\_\_\_ .
  - g. An electric current brings about chemical changes in most conducting \_\_\_\_\_.
  - h. In electrolysis of copper sulphate solution, copper is deposited at \_\_\_\_\_ electrode.
3. Tick the correct option(s):-
  - (i) Electricity is a
    - a. bad servant and a bad master
    - b. good servant and a good master
    - c. bad servant but a good master
    - d. good servant but a bad master
  
  - (ii) If the gap in an electric circuit is filled with a liquid, the current in the circuit
    - a. flows in some cases and not in others
    - b. never flows.
    - c. always flows
    - d. flows only in case of distilled water
  
  - (iii) For electroplating an iron rod with copper, we use
    - a. iron sulphate solution to deposit iron on copper
    - b. copper sulphate solution to deposit iron on copper
    - c. copper sulphate solution to deposit copper on iron
    - d. iron sulphate solution to deposit copper on iron

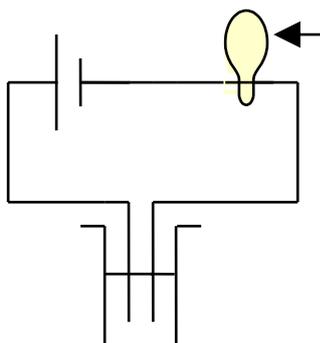
- (iv) A dry cell converts chemical energy into
  - a. mechanical energy
  - b. heat energy
  - c. electrical energy
  - d. none of these
  
- (v) An object with excess of electrons
  - a. negatively charged
  - b. positively charged
  - c. neutral
  - d. charged but sign of charge cannot be predicted
  
- (vi) Which of the following is not a conductor of electricity?
  - a. brine water
  - b. tap water
  - c. distilled water
  - d. sea water

## Chapter – 14

### CHEMICAL EFFECTS OF ELECTRIC CURRENT

#### Assignment 14.2

1. A simple circuit (tester) is shown. It does not work. What could be the possible reasons?



bulb

2. Mention 3 devices which can be used to test the conductivity of liquids.
3. Give 2 examples each of acids, bases and salts?
4. What are the 3 possible chemical changes which may occur when electric current is passed through a conducting solution?
5. What were the observations of William Nicholson when the electrodes were immersed in water?
6. How can the addition of salt in distilled water change its conductivity?
7. How can you identify the terminals of a cell kept in a concealed box when the other two ends of wire connected to the cell are inserted in a potato?
8. What are the practical applications of electroplating?
9. Where is chromium plating done and why? Why are iron objects electroplated with zinc?
10. Can a wooden object be coated with a metal by electroplating? Give reason for your answer.
11. The amount of metal deposited on the negative electrode during electroplating depends on two factors. What are they?

**Chapter – 14**

**CHEMICAL EFFECTS OF ELECTRIC CURRENT**

**Assignment 14.3**

**Give reasons for the following:-**

1. We should not touch electrical appliances with wet hands.

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2. Common salt does not conduct electricity but salt solution does.

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3. LED has been used rather than normal bulb to test the conductivity of liquids.

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4. Tin cans used for storing food are made by electroplating tin onto iron.

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5. Bridges and automobiles made of iron are given a coating of zinc.

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6. Artificial jewellery is coated with a layer of gold or silver.

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7. Kitchen gas burners are electroplated with chromium.

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**H.O.T.S.**

**It is preferable to use a carbon dioxide extinguisher rather than water to douse electric fire. Why?**

## QUESTION BANK

1. Fill in the blanks :-
  - i. Sound requires a \_\_\_\_\_ to travel.
  - j. A force can \_\_\_\_\_ a moving body or change the \_\_\_\_\_ of motion.
  - k. Pitch of a sound depends on \_\_\_\_\_ of vibration.
  - l. Electric charges exert \_\_\_\_\_ force and magnets exert \_\_\_\_\_ force.
  - m. Sounds above 20,000 Hz are called \_\_\_\_\_.
  - n. \_\_\_\_\_ is the time taken to complete one vibration.
2. What is noise pollution? How can it be reduced?
3. Which are the states of matter in which sound travels the fastest and the slowest?
4. Give an example to prove that 'light travels faster than sound'?
5. Describe an activity to show that a body producing sound is in a state of vibration.
6. Rewrite the following statements correctly:-
  - a. All vegetable oils are electrolytes.
  - b. Kaleidoscopes are used by barbers to show the back of the head.
  - c. The object to be electroplated is connected to the positive electrode.
  - d. Poor vision is caused due to the deficiency of vitamin C.
  - e. A ray of light which bounces off from the reflecting surface is the incident .
7. How can distilled water be made a conductor of electricity?
8. State the laws of reflection..
9. Describe an activity to show the chemical effects of electric current.
10. Define electrolysis and mention three of its applications.
11. Give two differences between real and virtual image.
12. What is the function of ciliary muscles?

13. What is meant by regular and diffused reflection? Give one advantage of each .
14. A metal is released in the electrolysis of a salt. At which electrode will it be deposited?
15. Electric current can bring about a chemical change. Prove this statement with the help of an activity.
16. Explain the construction and working of electrolysis of copper sulphate solution with a neat labelled diagram.

**ALL THE BEST !!!!!**

## RECAPITULATION

Rewrite the given sentences and fill in the blanks, underlining the answer word.

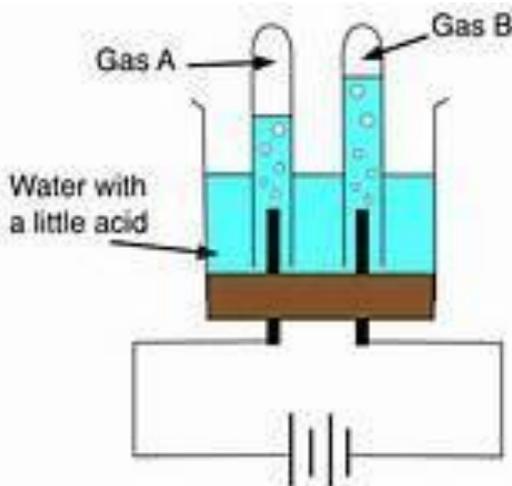
- a. An optical device used by sailors, that works on the principle of light reflection from two plane mirrors placed parallel to one another is a-----while that which works using three parallel mirrors inclined at 60 degrees to one another is a -----.
- b. Weak electric current flowing through liquids with low conductivities can be tested by using a -----  
- or a -----.
- c. Shrillness of a sound is determined by the ----- of a sound wave while loudness is determined by the -----of a sound wave.
- d. If the angle between the incident ray and the surface of a plane mirror is 35 degrees, the angle of incidence is -----  
----- and the angle between incident ray and the reflected ray is -----
- e. Musical notes produced by a guitar is caused by vibrating ----- while that produced by a tabla is caused by a vibrating -----.

Q2. Answer in brief-

- a. On throwing a pebble into a pond, ripples are observed with water molecules vibrating at the rate of 18000 times per minute.
  - i. Determine the frequency and time period of the wave?
  - ii. Will this sound be audible to man?
- b. Define a non electrolyte? Mention briefly,two possible effects observed, on passing electric current through an electrolyte?
- c. How is sound produced by human beings?
- d. Rahul stays in a noisy locality and suffers from the ill effects of noise pollution. His friend Reena took the initiative to implement a few measures to control noise pollution in the area.
  - i. Suggest three common sources of noise pollution in a residential locality?
  - ii. What value is reflected in Reena's action?

Q3 . Answer the following -

- a. Draw a neat labeled the diagram?
- b. Explain the sequenc sensation of hearing
- c. Observe the given f
  - i. Name and c
  - ii. Name the g
  - iii. If the water your answe



object by a plane mirror? Write the key for  
different parts of the ear, giving us the  
stilled water, state your observation? Justify

- a. Draw a neat labeled diagram to show electroplating of a spoon with silver?
- b. Explain the above process? Write your answer in points.

### **FACTOPAEDIA IN PHYSICS**

- Although tyres of all vehicles are grooved, the tyres of racing cars are smooth to reduce friction so that they can run faster. These tyres are called slicks.
- Sustained exposure for 8 hours or more at 90-95 dB can result in hearing loss.
- The word 'noise' is derived from a latin word 'noxia' which means 'I do harm'.
- Audible range of some animals

<b>Animal</b>	<b>Audible Range</b>
Dogs	as high as 40,000 hz
Cats	100 – 60,000 Hz
Elephants	1 – 20,000 Hz
Grasshopper	upto 50,000 Hz
Mice	1000 – 1,00,000 Hz
Dolphin	upto 1,00,000 Hz
Moth	1000 – 2,40,000 Hz

➤ Loudness of sound produced by different objects / activities

<b>Object/activity</b>	<b>loudness in dB</b>
Silence	0
Breathing	10
Ticking clock/murmuring	30
City traffic	60-90
Subway train	95
Car horn	110
DJ/Rock n roll music	120
Jet engine / Gunblast	140

➤ **Strength of earthquake and its effect**

<b>Richter scale reading</b>	<b>Nature of earthquake</b>
0-3.5	May not be felt, can be recorded
3.5-5.4	Often felt, but rarely causes damage
5.5 – 6.0	Slight damage to well constructed buildings
6.1-6.9	Can be destructive in areas upto 10km across

7-7.9

Major earthquake, causes serious damage over larger areas

8 and above

Severe, serious damage across several 100 km

- Whales in the ocean “sing” to each other. The sound of their song can travel a distance of 800 km.
- The earliest seismograph was invented in China, in AD 136, by a man named Choko.
- We cannot dive more than 120 m (approx) in water. Water pressure below this level is enough to crush the human body.
- Dogs can hear sound at a higher frequency than humans, allowing them to hear noises that we cannot.
- A flash of lightning could power a light bulb for a month.
- The blue whale can produce sounds up to 188 decibels. This is the loudest sound produced by a living animal and has been detected as far away as 530 miles.
- The first coast to coast telephone line was established in 1914.
- The largest meteorite crater in the world is in Winslow, Arizona. It is 4150 feet across and 150 feet deep.
- The human eye blinks an average of 4,200,000 times a year.
- The highest temperature produced in a laboratory was 920,000,000 F (511,000,000) at the Tokamak Fusion Test Reactor in Princeton, NJ, USA.
- The hottest planet in the solar system is Venus, with an estimated surface temperature of 864 F (462 C).
- The cosmos contains approximately 50,000,000,000 galaxies.
- There are between  $10^{11}$  and  $10^{12}$  stars in a normal galaxy.
- The microwave was invented after a researcher walked by a radar tube and a chocolate bar melted in his pocket.
- A car travelling at a speed of 80 km/h uses half its fuel to overcome wind resistance.
- There is enough fuel in a full tank of Jumbo Jet to drive an average car four times around the world.
- It takes 70% less energy to produce a ton of paper from recycled paper than from trees.
- Cats have over one hundred vocal sounds, while dogs have only about ten.

Add a few more to this list and write them down here-

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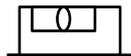
**GET READY FOR COMPETITIVE EXAMINATIONS !!!**

1. A sheet of paper is placed on a table and a jug full of water is kept on it while pulling the paper suddenly, it is observed that the water does not spill out of jug. It is due to the inertia of the-
  - (a) paper sheet
  - (b) jug and water in it
  - (c) hand
  - (d) table
2. "Every action has an equal and opposite reaction" was discovered by
  - (a) Pascal
  - (b) Newton
  - (c) Edison
  - (d) Copernicus

3. If a car travels a distance of 100 km and it takes 25 minutes to reach its destination, the speed of the car is
  - (a) 4 km/min
  - (b) 4 m/min
  - (c) 400 m/min
  - (d) None of these
4. Who was the scientist who gave a relationship between mechanical energy and heat energy
  - (a) Darwin
  - (b) James Watt
  - (c) James Prescott Joule
  - (d) Isaac Newton
5. A 1500 W electric geyser is used everyday for 2 h. Calculate the energy consumed.
  - (a) 90 kWh
  - (b) 30 kWh
  - (c) 750 kWh
  - (d) None of these
6. According to law of conservation of energy, during a process or system of transformation of energy, the energy is
  - (a) always lost
  - (b) always gained
  - (c) neither gained nor lost
  - (d) only gets converted from heat to mechanical energy
7. An engine supplies 196 J of energy. If the energy is supplied to a weight of 500 g, how high can it be lifted?
  - (a) 38.2 m
  - (b) 39.2 m
  - (c) 40.2 m
  - (d) 42 m
8. Which of the following force is responsible for taking a gas balloon upwards?
  - (a) gravitational force
  - (b) muscular force
  - (c) buoyant force
  - (d) magnetic force
9. When white light is passed through a prism, it is observed that violet light bends more than the red light. This is because
  - (a) velocity of red light in glass is less than that of violet light
  - (b) refractive index of glass is more for violet light
  - (c) wavelength of violet light is less than that of red light
  - (d) it is the property of these colours
10. Pascal's law holds good for
  - (a) gases only
  - (b) liquids and gases
  - (c) solids only
  - (d) for all
11. The instrument for measuring fairly large electric current is known as
  - (a) ammeter
  - (b) voltmeter
  - (c) galvanometer
  - (d) voltmeter
12. At what temperature, the velocity of sound in air is 1.5 times the velocity at 70°C
  - (a) 357 °C
  - (b) 387 °C
  - (c) 350 °C
  - (d) 290 °C

13. If  $m_1$  and  $m_2$  are the masses of 2 bodies,  $d$  be the distance between them, then the force of attraction  $F$  according to Universal Law of Gravitation is
- (a)  $F = m_1 m_2 / d^2$
  - (b)  $F = G m_1 m_2 / d$
  - (c)  $F = G m_1 m_2 / d^2$
  - (d)  $F = G m_1^2 m_2^2 / d^2$
14. The acceleration due to gravity is zero at
- (a) poles
  - (b) equator
  - (c) centre of earth
  - (d) none of these
15. The size of an atom is nearly
- (a)  $10^{-5}$  m
  - (b)  $10^{-8}$  m
  - (c)  $10^{-15}$  m
  - (d)  $10^{-10}$  m
16. The force of repulsion between two parallel wires is  $f$  when each one of them carries a certain current  $I$ . If the current in each is doubled, the force between them would be-
- (a)  $2f$
  - (b)  $3f$
  - (c)  $4f$
  - (d)  $f/4$
17. A fuse wire has essentially
- (a) high resistance and high melting point
  - (b) low resistance and low melting point
  - (c) low resistance and high melting point
  - (d) high resistance and low melting point
18. The emf of 3 identical cells connected in series is 6V. The emf of each cell is
- (a) 6 V
  - (b) 2 V
  - (c) 2 V
  - (d) None of these
19. A person using convex lens must be suffering from
- (a) myopia
  - (b) astigmatism
  - (c) hypermetropia
  - (d) none of these
20. If there is no atmosphere, then the duration of daylight on earth will
- (a) increase
  - (b) decrease
  - (c) remain same
  - (d) none of these
21. The critical angle of liquid is  $30^\circ$ . Its refractive index will be
- (a) 4
  - (b) 2
  - (c) 3
  - (d) 0.5
22. A hygrometer measures
- (a) the constant of hygroscopic substance
  - (b) relative density of solids
  - (c) relative density of liquids
  - (d) amount of water vapour in air
23. The value of Planck's constant

- (a) depends upon frequency
  - (b) is always same
  - (c) depends upon energy
  - (d) depends upon wavelength
24. Doping is a process of
- (a) purifying the semi conductor
  - (b) making the material crystalline
  - (c) adding controlled impurities into the material
  - (d) making the material an insulator
25. The frequency of a source is 15 kHz. The frequencies of the sound wave produced by it in water and air will
- (a) be the same as that of the source
  - (b) be different. Frequency in water will be more than that of air
  - (c) be different. Frequency in air will be more than that of water
  - (d) depend upon the velocities of sound in these media
26. The image formed by a plane mirror is always
- (a) real and erect
  - (b) virtual and erect
  - (c) virtual and inverted
  - (d) real and inverted
27. A spirit level is used to determine the surface level. As shown in the figure, the air bubble will be at the centre of the tube if the surface is horizontal. This is so because of



- (a) equilibrium of forces on the air bubble
  - (b) balanced pressure on the air bubble
  - (c) the property of air bubble
  - (d) gravitational force
28. In a stethoscope the sound of heart beat travel through its tubes
- (a) by bending along the tube
  - (b) in a straight line
  - (c) by undergoing multiple reflections
  - (d) as ultrasonic frequency
29. 1 fermi is equal to
- (a)  $10^{-15}$  m
  - (b)  $10^{15}$  m
  - (c)  $10^{-12}$  m
  - (d)  $10^{12}$  m
30. Pound is the unit of \_\_\_\_\_ in FPS system
- (a) Mass
  - (b) Length
  - (c) Time
  - (d) Temperature
31. A monkey is at rest on a weightless rope which goes over a pulley and is tied to a bunch of bananas at the other end. The weight of the bunch of bananas is exactly the same as that of the monkey. The pulley is frictionless and weightless. The monkey starts to climb the rope to reach the bananas. As he climbs, the distance between him and the bananas will
- (a) Decrease
  - (b) Increase
  - (c) First decrease and then increase
  - (d) Remain unchanged
32. Two bodies of equal weights are kept at heights of h and 1.5 h respectively. The ratio of their P.E. is
- (a) 3 : 2

- (b) 2 : 3
  - (c) 1 : 1
  - (d) None of these
33. How will the reading in the ammeter A be affected if another identical bulb Q is connected in parallel to P? The voltage in the mains is maintained at a constant value.
- (a) The reading will be reduced to one-limit
  - (b) The reading will not be affected
  - (c) The reading will be double the previous value.
  - (d) The reading will be increased four-fold
34. The end where the current flows anticlockwise in a solenoid is
- (a) north pole
  - (b) south pole
  - (c) eastern pole
  - (d) western pole
35. The colour of central line among lines of 7 colours in a rainbow is
- (a) green
  - (b) blue
  - (c) yellow
  - (d) indigo
36. A compound microscope has
- (a) convex lens
  - (b) concave lens
  - (c) convex mirror
  - (d) concave mirror
37. Frequency of sound means
- (a) displacement in vibrating object
  - (b) number of vibrations in a vibrating object per unit time
  - (c) time taken per vibration
  - (d) none of the above
38. Which of the following matter has maximum resistance?
- (a) silver
  - (b) copper
  - (c) aluminium
  - (d) nichrome
39. The resistance of any conducting wire at constant temperature depends upon
- (a) the length of the wire
  - (b) cross-sectional area and length of wire
  - (c) cross-sectional area of wire
  - (d) none of these
40. The image of an object kept between focus and optical center of a convex lens will be
- (a) enlarged, erect and virtual
  - (b) enlarged, erect and real
  - (c) small, erect and virtual
  - (d) small, erect and real
41. The lens of the spectacles used to remove shortsightedness \_\_\_\_\_ the light rays.
- (a) converges
  - (b) diverges
  - (c) absorbs
  - (d) refract
42. If 60J energy is consumed in flowing 1 ampere current for 10 s in a conductor then what will be the potential difference at its ends
- (a) 6 V
  - (b) 600 V
  - (c) 10/60 V
  - (d) 6000 V

43. If upthrust is less than the weight of an object then the object will
- (a) sink fully
  - (b) float but completely submerged
  - (c) float but partially submerged
  - (d) float on the surface
44. Bakelite is used in
- (a) making car windows
  - (b) making non-stick utensils
  - (c) making electric switches
  - (d) making strong pipes
45. A uniform elastic spring is suspended vertically from a rigid support. Its length is observed to increase by 2 cm, when a force of 0.1 N is applied to its free end. On applying an additional force F, the total increase in the length of the spring becomes 6 cm. The value of F is
- (a) 0.1 N
  - (b) 0.2 N
  - (c) 0.3 N
  - (d) 0.4 N
46. The average frictional force needed to stop a car weighing 500 kg in a distance of 25 m, if the initial speed is 72 km/h, will be
- (a) 2000 N
  - (b) 3000 N
  - (c) 4000 N
  - (d) 5000 N
47. A thermos flask is made of two layers of glass. The air between these two layers is removed and the flask is sealed. This is done to minimize the transfer of heat by the processes of
- (a) conduction, convection and radiation
  - (b) radiation and conduction
  - (c) conduction and convection
  - (d) convection and radiation
48. An object is kept at a distance of 50 cm from a lens. The lens forms an inverted and equal sized image of this object. The type and power of this lens are respectively
- (a) convex; +2D
  - (b) convex; +4D
  - (c) concave; -2D
  - (d) concave; -4D
49. A ship sends a strong sound signal straight down and detects its echo after 1.5 s. The depth of the sea at this point is [speed of sound in air and sea water are 340 m/s and 1440m/s respectively]
- (a) 2.16 km
  - (b) 1.08 km
  - (c) 0.51 km
  - (d) 0.255 km
50. When a wave goes from one point to another in a medium, there is transfer of
- (a) energy but not of mass
  - (b) mass but not of energy
  - (c) both mass and energy
  - (d) neither mass nor energy
51. An electric heater is used for 5 h on a 220V supply and takes a current of 5 A. What is its power?
- (a) 41W
  - (b) 110W
  - (c) 44W
  - (d) 1100W

52. The change of velocity with respect to time is called
- (a) velocity
  - (b) acceleration
  - (c) average speed
  - (d) distance
53. The value of absolute zero is
- (a)  $-273^{\circ}\text{C}$
  - (b)  $273^{\circ}\text{C}$
  - (c)  $-273\text{K}$
  - (d)  $273\text{K}$
54. The long sightedness of human eyes can be corrected by using
- (a) convex mirror
  - (b) convex lens
  - (c) concave mirror
  - (d) concave lens
55. The quantity of heat required to raise the temperature of 1g of a substance through  $1^{\circ}\text{C}$  is
- (a) latent heat
  - (b) specific heat
  - (c) heat
  - (d) all of the above
56. Which of the following is equal to 1Wh?
- (a)  $36 \times 10^3 \text{ J}$
  - (b)  $3.6 \times 10^3 \text{ J}$
  - (c)  $360 \times 10^3 \text{ J}$
  - (d)  $3.6 \times 10^5 \text{ J}$
57. If the distance between two magnets is doubled, then the force between them becomes
- (a) twice
  - (b) half
  - (c) four times
  - (d) one fourth
58. A man suffering from shortsightedness is unable to see object at distance greater than 4m. The power of the lens required to correct this defect is
- (a) +5D
  - (b) -25D
  - (c) +2.5D
  - (d) None of the above
59. The rate of change of momentum of a body is directly proportional to the external impressed force and takes place in the direction in which the force acts. This is
- (a) Newton's law
  - (b) Archimedes principle
  - (c) Kepler's law
  - (d) Hook's law
60. Stress is directly proportional to strain. This is
- (a) Dalton's law
  - (b) Newton's law
  - (c) Hook's law
  - (d) Kepler's law
61. Which mirror always forms a virtual, erect and small image of an object?
- (a) concave mirror
  - (b) convex mirror
  - (c) plane mirror

- (d) none of the above
62. In an electric motor, the rotation of the coil can be increased by increasing
- (a) number of turns in the coil
  - (b) strength of horse shoe magnet
  - (c) current flowing through the coil
  - (d) all the above
63. Capillary action depends upon the
- (a) diameter of capillary
  - (b) surface tension of liquid
  - (c) both(a) and (b)
  - (d) neither (a) nor (b)
64. Which of the following is a vector quantity?
- (a) work
  - (b) speed
  - (c) distance
  - (d) velocity
65. The number of vibrations completed by a particle in one second is known as
- (a) time period
  - (b) frequency
  - (c) wavelength
  - (d) distance
66. Magnetic field is not produced by
- (a) an electric charge in uniform motion
  - (b) an electric charge which is stationary
  - (c) an electric charge in acceleration
  - (d) none of the above.
67. The total resistance of 3 resistors, each of  $3\ \Omega$  connected in series will be
- (a)  $9\ \Omega$
  - (b)  $1\ \Omega$
  - (c)  $3\ \Omega$
68. Water rises in a capillary tube due to
- (a) surface tension
  - (b) force
  - (c) viscosity
  - (d) none of the above
69. The acceleration of a moving body with uniform velocity
- (a) is zero
  - (b) increases
  - (c) decreases
  - (d) none of the above
70. A wave completes 20 vibrations in 4s. Its frequency will be
- (a) 30Hz
  - (b) 0.5Hz
  - (c) 5Hz
  - (d)  $1/5\ \text{Hz}$
71. A fish in water appears to be at 30cm from the surface. If the refractive index of water is  $4/3$ , the true depth at which fish remains is
- (a) 10 cm
  - (b) 70 cm
  - (c) 30 cm

- (d) 40 cm
72. Coulomb is unit of
- (a) force
  - (b) kinetic energy
  - (c) charge
  - (d) none of the above
73. Wood is a poor conductor of electricity because
- (a) it is lighter
  - (b) it is a non metal
  - (c) electrons in their atoms are well bounded to nuclei
  - (d) none of the above
74. On the surface of the earth, the gravitational potential energy of a body is
- (a) maximum
  - (b) minimum
  - (c) infinite
  - (d) none of the above
75. At the magnetic poles, the angle of dip is
- (a) zero
  - (b)  $45^\circ$
  - (c)  $180^\circ$
  - (d)  $100^\circ$