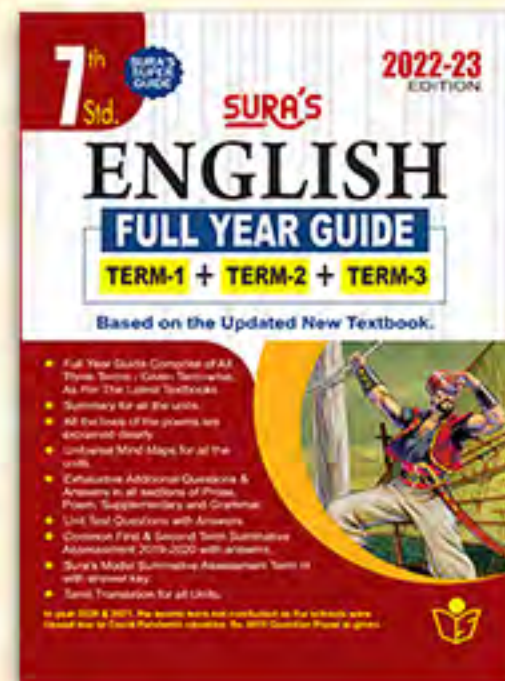


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It gives me great pride and pleasure in bringing to you **Sura's Science Guide** for **7<sup>th</sup> Standard [Term-I+II+III]**. It is prepared as per the updated Textbook.

This guide encompasses all the requirements of the students to comprehend the text and the evaluation of the textbook.

Additional questions have been provided exhaustively for clear understanding of the units under study.

In order to learn effectively, I advise students to learn the subject section-wise and practice the exercises given. It will be a teaching companion to teachers and a learning companion to students.

Though these salient features are available in this Guide, I cannot negate the indispensable role of the teachers in assisting the student to understand the subject thoroughly.

I sincerely believe this guide satisfies the needs of the students and bolsters the teaching methodologies of the teachers.

I pray the almighty to bless the students for consummate success in their examinations.

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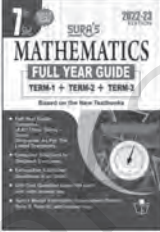

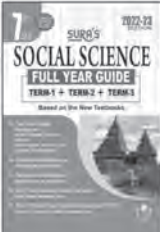
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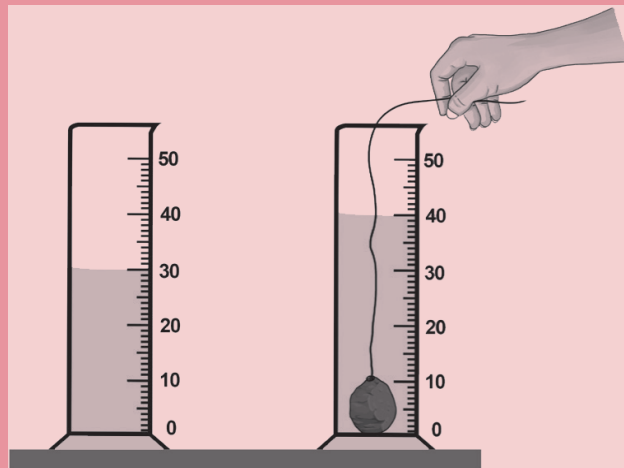
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# TERM

## I





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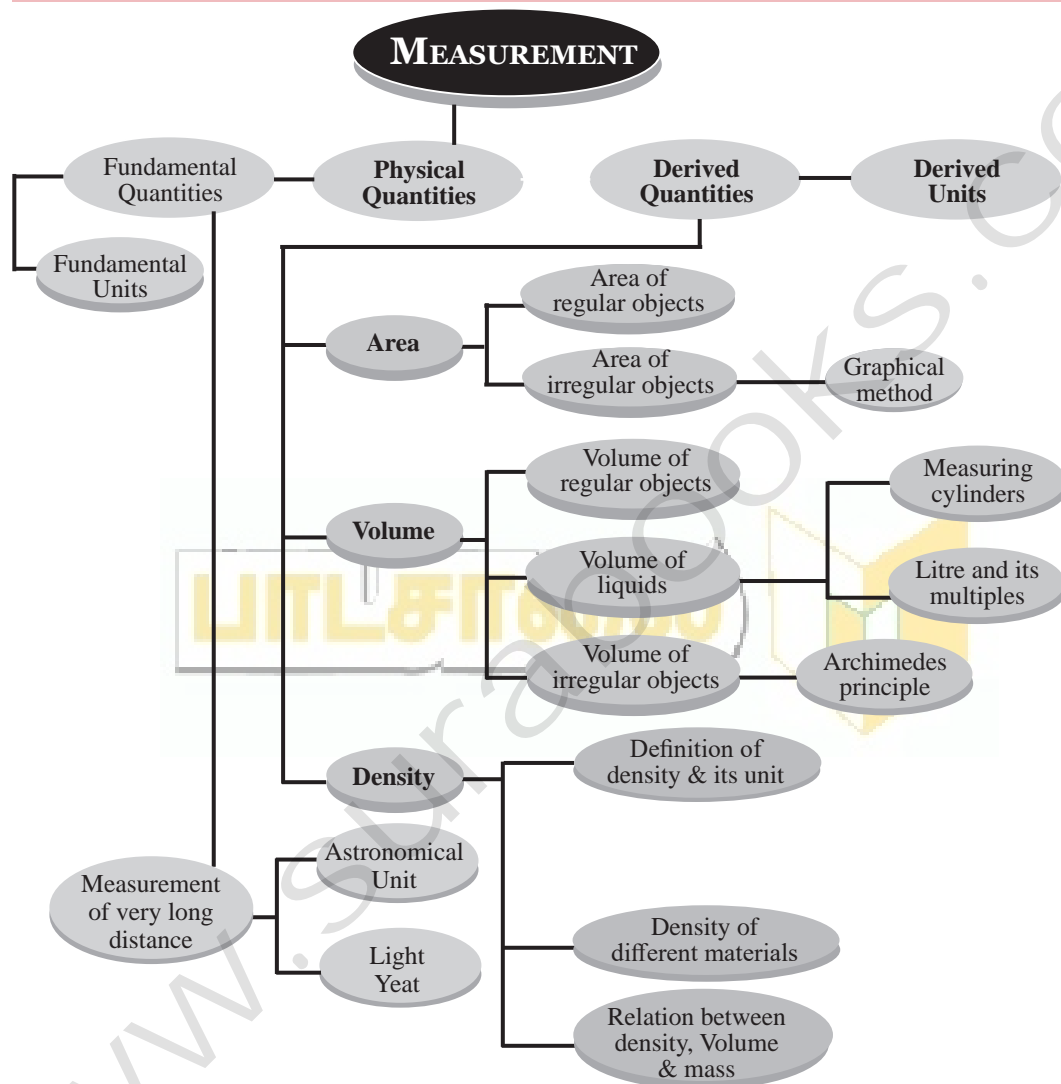
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# Unit 1

# MEASUREMENT

## CONCEPT MAP



## Definitions

<b>Physical quantity</b>	:	A quantity that can be measured is called a physical quantity.
<b>Measurement</b>	:	Measurement is a process of comparing an unknown physical quantity with a known physical quantity called unit.
<b>Unit</b>	:	A unit is a known measure of a physical quantity with which physical quantities of the same kind are measured.



<b>Area</b>	:	Area is the measure of the region inside a closed line.
<b>Volume</b>	:	The amount of space occupied by a three dimensional object is known as its volume.
<b>Capacity of a container</b>	:	The maximum volume of liquid that a container can hold is called as capacity of the container.
<b>Density</b>	:	Density of a substance is defined as the mass of the substance contained in unit volume ( $1 \text{ m}^3$ )
<b>Astronomical Unit</b>	:	One astronomical unit is defined as the average distance between the earth and the sun.
<b>Light year</b>	:	One light year is defined as the distance traveled by light in vacuum during the period of one year.
<b>Fundamental quantities</b>	:	A set of physical quantities which cannot be expressed in terms of any other quantities are known as "Fundamental quantities". Their corresponding units are called "Fundamental units".
<b>Derived quantities</b>	:	The physical quantities which can be obtained by mathematically combining (i.e., multiplying and dividing) the fundamental quantities are known as "Derived quantities". Their corresponding units are called "Derived units".
<b>Perihelion</b>	:	It is the position of the shortest distance between the earth and the sun.
<b>Aphelion</b>	:	It is the position of the largest distance between the earth and the sun.

### Formulae to Remember

S. No	Dimension	Formula	Unit
1.	Area of rectangle	$= l \times b$	$\text{m}^2$
2.	Area of square	$= s \times s$	$\text{m}^2$
3.	Area of circle	$= \pi \times r^2$	$\text{m}^2$
4.	Triangle	$= \frac{1}{2} \times b \times h$	$\text{m}^2$
5.	Volume	$= l \times b \times h$	$\text{m}^3$
6.	Speed	$= \text{distance/time}$	$\text{m/s}$
7.	Electric charge	$= \text{electric current} \times \text{time}$	Coulomb (C)
8.	Density	$= \text{Mass/Volume}$	$\text{Kg/m}^3$
9.	Mass	$= \text{Density} \times \text{Volume}$	kg
10.	Volume	$= \text{mass/density}$	$\text{m}^3$
11.	Volume of cube	$= a \times a \times a$	$\text{m}^3$





12.	Volume of cuboid	= $l \times b \times h$	$m^3$
13.	Volume of sphere	= $\frac{4}{3} \times \pi \times r^3$	$m^3$
14.	Cylinder	= $\pi \times r^2 \times h$	$m^3$
15.	Light year	= Speed of light in vacuum $\times$ time = $3 \times 10^8 \text{ m/s} \times 365 \times 24 \times 60 \times 60$ = $9.46 \times 10^{15} \text{ m}$	
16.	Astronomical unit	= Average distance between the earth and the sun = $1.496 \times 10^{11} \text{ m}$	



## Evaluation

### I. Choose the best answer.

#### 1. Which of the following is a derived unit?

- (a) mass      (b) time      (c) area      (d) length

**Ans (c) area**

#### 2. Which of the following is correct?

- (a) 1L = 1 cc      (b) 1L = 10 cc  
(c) 1L = 100 cc      (d) 1L = 1000 cc

**Ans (d) 1L = 1000 cc**

#### 3. SI unit of density is

- (a)  $\text{kg/m}^2$       (b)  $\text{kg/m}^3$       (c)  $\text{kg/m}$       (d)  $\text{g/m}^3$

**Ans (b)  $\text{kg/m}^3$**

#### 4. Two spheres have equal mass and volume in the ratio 2:1. The ratio of their density is

- (a) 1:2      (b) 2:1      (c) 4:1      (d) 1:4

**Ans (a) 1:2**

#### 5. Light year is the unit of

- (a) distance      (b) time  
(c) density      (d) Both length and time

**Ans (a) distance**

### II. Fill in the blanks:

#### 1. Volume of irregularly shaped objects are measured using the law of \_\_\_\_\_.

**Ans Archimedes**

#### 2. One cubic metre is equal to \_\_\_\_\_ cubic centimetre.

**Ans 10,00,000 or  $10^6$**

#### 3. Density of mercury is \_\_\_\_\_.

**Ans  $13,600 \text{ kg/m}^3$**

#### 4. One astronomical unit is equal to \_\_\_\_\_.

**Ans  $1.496 \times 10^{11} \text{ m}$**

#### 5. The area of a leaf can be measured using a \_\_\_\_\_

**Ans graph sheet**



### III. State true or false. If false, correct the statement.

**1. The region covered by the boundary of the plane figure is called its volume.**

**Ans.** False. Correct statement : The region covered by the boundary of plane figure is called its **area**.

**2. Volume of liquids can be found using measuring containers.**

**Ans.** True

**3. Water is denser than kerosene.**

**Ans.** True

**4. A ball of iron floats in mercury.**

**Ans.** True

**5. A substance which contains less number of molecules per unit volume is said to be denser.**

**Ans.** False. Correct statement : A substance which contains **more** number of molecules per unit volume is said to be denser.

### IV. Match the following items.

**a.**

i.	Area	(a)	light year
ii.	Distance	(b)	m <sup>3</sup>
iii.	Density	(c)	m <sup>2</sup>
iv.	Volume	(d)	kg
v.	Mass	(e)	kg / m <sup>3</sup>

**Ans** i-c, ii-a, iii-e, iv- b, v - d

**b.**

i.	Area	(a)	g / cm <sup>3</sup>
ii.	Length	(b)	measuring jar
iii.	Density	(c)	amount of a substance
iv.	Volume	(d)	rope
v.	Mass	(e)	plane figures

**Ans** i-e, ii-d, iii-a, iv- b, v - c

### V. Arrange the following in correct sequence :

**1. 1 L, 100 cc, 10 L, 10 cc**

**Ans.** 10 cc, 100 cc, 1 L, 10 L

**2. Copper, Aluminium, Gold, Iron**

**Ans.** Aluminium, Iron, Copper, Gold



### VI. Use the analogy to fill in the blank:

1. Area:  $M^2$  :: Volume : \_\_\_\_\_ **Ans**  $M^3$
2. Liquid : Litre :: Solid : \_\_\_\_\_ **Ans**  $cm^3$
3. Water : Kerosene :: \_\_\_\_\_ : Aluminium **Ans** Iron

### VII. Consider the following statements and choose the correct option.

- (a) Both assertion and reason are true and reason is the correct explanation of assertion.
- (b) Both assertion and reason are true, but reason is not the correct explanation of assertion.
- (c) Assertion is true but reason is false
- (d) Assertion is false but reason is true.

1. **Assertion (A) :** Volume of a stone is found using a measuring cylinder.

**Reason (R) :** Stone is an irregularly shaped object.

**Ans** (a) Both assertion and reason are true and reason is the correct explanation of assertion

2. **Assertion (A) :** Wood floats in water.

**Reason (R) :** Water is a transparent liquid.

**Ans** (b) Both assertion and reason are true, but reason is not the correct explanation of assertion

**Correct explanation:** Water is denser than iron.

3. **Assertion (A) :** Iron ball sinks in water.

**Reason (R) :** Density of iron is more than that of water.

**Ans** (c) Assertion is true but reason is false

**Correct explanation :** Density of iron is more than that of water.

### VIII. Answer very briefly.

1. Name some of the derived quantities.

**Ans.** Area, volume, density.

2. Give the value of one light year.

**Ans.** One light year =  $9.46 \times 10^{15}m$

3. Write down the formula used to find the volume of a cylinder.

**Ans.** Volume of a cylinder =  $\pi r^2 h$ ;  $\pi = \frac{22}{7}$ ,  $r$  = radius,  $h$  = height

4. Give the formula to find the density of objects.

**Ans.** Density (D) =  $\frac{\text{mass}(m)}{\text{volume}(v)}$

$$D = \frac{(m)}{(v)}$$





**5. Name the liquid in which iron ball sinks.**

**Ans.** Iron ball sinks in water. The density of an iron ball is more than that of water so it sinks in water.

**6. Name the units used to measure the distance between celestial objects.**

**Ans.** Astronomical unit and light year are the units used to measure the distance between celestial objects.

**7. What is the density of gold?**

**Ans.** Density of gold is  $19,300 \text{ kg/m}^3$ .

### **IX. Answer briefly.**

**1. What are derived quantities?**

**Ans.** The physical quantities which can be obtained by multiplying, dividing or by mathematically combining the fundamental quantities are known as derived quantities.

(or)

The physical quantities which are expressed in terms of fundamental quantities are called derived quantities.

**2. Distinguish between the volume of liquid and capacity of a container.**

<b>Ans.</b>	<b>S.No</b>	<b>Volume of liquid</b>	<b>Capacity of a container</b>
	1.	Volume is the amount of space taken up by a liquid	Capacity is the measure of an object's ability to hold a substance like solid, liquid or gas
	2.	It is measured in cubic units.	It is measured in litres, gallons, pounds, etc.
	3.	It is calculated by multiplying the length, width and height of an object.	Its measurement is cc or ml.

**3. Define the density of objects.**

**Ans.** Density of a substance is defined as the mass of the substance contained in unit volume.

$$\text{Density (D)} = \frac{\text{mass (m)}}{\text{volume (v)}}$$

**4. What is one light year?**

**Ans.** One light year is the distance travelled by light in vacuum during the period of one year.

$$1 \text{ Light year} = 9.46 \times 10^{15} \text{m.}$$

**5. Define - Astronomical unit?**

**Ans.** One astronomical unit is defined as the average distance between the earth and the sun.

$$1 \text{AU} = 1.496 \times 10^8 \text{km} = 1.496 \times 10^{11} \text{m.}$$



## X. Answer in detail.

### 1. Describe the graphical method to find the area of an irregularly shaped plane figure.

**Ans.** To find the area of an irregularly shaped plane figure, we have to use graph paper.

- (i) Place a piece of paper with an irregular shape on a graph paper and draw its outline.
- (ii) To find the area enclosed by the outline, count the number of squares inside it (M).
- (iii) You will find that some squares lie partially inside the outline.
- (iv) Count a square only if half (p) or more of it (N) lies inside the outline.
- (v) Finally count the number of squares, that are less than half. Let it be Q.

For the shape in figure we have the following:

$$M = 50 \quad N = 7$$

$$P = 4 \quad Q = 4$$

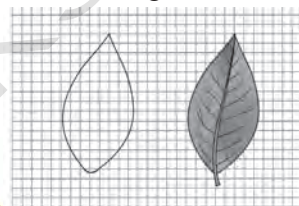
Now, the approximate area of the can be calculated using the following formula.

$$\text{Area of the leaf} = M + \left(\frac{3}{4}\right)N + \left(\frac{1}{2}\right)P + \left(\frac{1}{4}\right)Q \text{ sq. cm}$$

$$= 50 + \frac{3}{4} \times 7 + \frac{1}{2} \times 4 + \frac{1}{4} \times 4$$

$$= 50 + \frac{21}{4} + 2 + 1$$

$$= 53 + 5.25 = 58.25 \text{ sq.mm} = 0.5825 \text{ sq.cm}$$



Area of an irregularly shaped plane figure

### 2. How will you determine the density of a stone using a measuring jar?

**Ans.** Determination of density of a stone using a measuring cylinder.

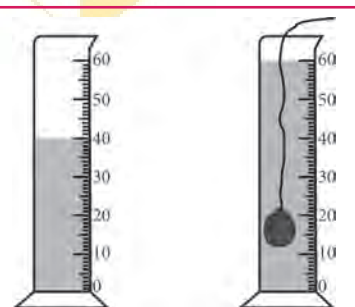
- (i) In order to determine the density of a solid, we must know the mass and volume of the stone.
- (ii) The mass of the stone is determined by a physical balance very accurately. Let it be 'm' grams.
- (iii) In order to find the volume, take a measuring cylinder and pour in it some water.
- (iv) Record the volume of water from the graduations marked on measuring cylinder. Let it be 40 cm<sup>3</sup>.
- (v) Now tie the given stone to a fine thread and lower it gently in the measuring cylinder, such that it is completely immersed in water.
- (vi) Record the new level of water. Let it be 60 cm<sup>3</sup>.

$$\therefore \text{Volume of the solid} = (60 - 40) \text{ cm}^3$$

$$= 20 \text{ cm}^3 = V \text{ cm}^3 \text{ (assume)}$$

Knowing the mass and the volume of the stone, the density can be calculate by the formula :

$$\text{Density} = \frac{\text{mass}}{\text{volume}} = \frac{m}{v} \text{ g/cm}^3$$



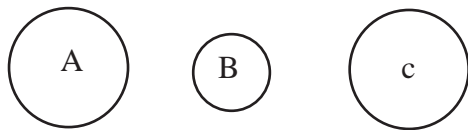
Density of a stone using measuring cylinder.



### **XI. Questions based on Higher Order Thinking Skills:**

- 1. There are three spheres A, B, C as shown below :**

Sphere A and B are made of same material. Sphere C is made of a different material. Spheres A and C have equal radii. The radius of sphere B is half that of A. Density of A is double that of C.



Now answer the following questions:

- Find the ratio of masses of spheres A and B.
- Find the ratio of volumes of spheres A and B.
- Find the ratio of masses of spheres A and C.

**Ans. i. Ratio of masses of spheres A and B**

$$M_A : M_B$$

$$D \times V_A : D \times V_B$$

(Radius of sphere B is half that of A)

$$\text{Let the mass of sphere A} = M_A$$

$$\text{Let the mass of sphere B} = M_B$$

$$\text{Mass} = \text{Density} \times \text{Volume}$$

$$M_A = D_A \times V_A$$

$$M_B = D_B \times V_B \quad (\text{Density is same})$$

$$\text{Volume of Sphere A} = \frac{4}{3}\pi r^3$$

$$\text{Volume of Sphere B} = \frac{4}{3}\pi \times \left(\frac{r_A}{2}\right)^3$$

$$D \times \frac{4}{3}\pi r^3 : D \times \frac{4}{3}\pi \left(\frac{r}{2}\right)^3 = 1 : \frac{1}{8} = 8:1$$

**ii. Ratio of volumes of spheres A and B**

$$V_A : V_B$$

$$\boxed{8:1}$$

(As mass is directly proportional to volume)

**iii. Ratio of masses of spheres A and C.**

$$M_A : M_C$$

$$2D \times V : D \times V$$

[ $\therefore$  Density of A is double that of C]

$$\boxed{2:1}$$





## UNIT TEST

**Time : 60 min.**

**Marks : 25**

**I. Choose the correct answer:**

**(3 × 1 = 3)**

1. The area of a spherical object is \_\_\_\_\_.

- (a)  $l \times b \times h$       (b)  $\pi r^2 h$       (c)  $\frac{4}{3} \times \pi \times r^2$       (d)  $a^3$

2. What is the SI unit of density?

- (a)  $a^2$       (b)  $\text{mm}^3$       (c)  $\text{kg/m}^3$       (d)  $\text{kg/m}^2$

3. The speed of light in vacuum is \_\_\_\_\_.

- (a)  $10 \times 10^6 \text{ m/s}$       (b)  $3 \times 10^8 \text{ m/s}$   
 (c)  $1.496 \times 10^{11} \text{ m/s}$       (d)  $2 \times 10^8 \text{ m/s}$

**II. Fill in the blanks.**

**(3 × 1 = 3)**

4. The unit of amount of substance is \_\_\_\_\_.

5. There are \_\_\_\_\_ fundamental physical quantities in SI units.

6. The materials with higher density are called \_\_\_\_\_.

**III. Match the following**

**(4 × 1 = 4)**

7. Cylinder	(a)	litre
8. Mass	(b)	$1000 \text{ kg/m}^3$
9. Volume of liquids	(c)	$\pi r^2 h$
10. water	(d)	kg

**IV. Answer in one word:**

**(4 × 1 = 4)**

11. What is the symbol of unit of temperature?

12. Name the method which is used to find the area of irregularly shaped figures.

13. What is the formula to calculate volume of a cube?

14. Name the unit which is used to measure distance between the two stars.

**V. Answer the following in one or two sentences:**

**(3 × 2 = 6)**

15. Define derived quantity.

16. Heavy objects sink in water and lighter objects float in water. give reason.

17. What do you mean by the term 'capacity of the container'?

18. What is light year?

19. Calculate the volume of wood of mass 5000 kg, when density of wood is  $0.5 \text{ g cm}^{-3}$

**VI. Answer the following in detail:**

**(5 × 1 = 5)**

20. (a) How will you find the area of irregular objects?

(or)

(b) Describe the graphical method to find the area of an irregularly shaped plane figure.


**Answer Key**

- I. 1. (c)  $\frac{4}{3} \times \pi \times r^2$       2. (c)  $\text{kg/m}^3$       3. (b)  $3 \times 10^8 \text{ m/s}$
- II. 4. mole      5. seven      6. denser
- III. 7 - c, 8 - d, 9 - a, 10 - b.
- IV. 11. kelvin      12. Graphical method
13. side  $\times$  side  $\times$  side      14. Astronomical unit
- V. 15. All other physical quantities which can be obtained by multiplying, dividing or by mathematically combining the fundamental quantities are known as "derived quantities".
16. The substances with the density more than (heavier objects)  $1\text{g/cm}^3$  sink in water.  
 Conversely, the substances having density less than  $1\text{g/cm}^3$ , float in water (lighter objects)
17. The maximum volume of liquid that a container can hold is known as the "capacity of the container"
18. One light year is defined as the distance travelled by light in vacuum during the period of one year.  $1 \text{ Light year} = 9.46 \times 10^{15} \text{ m}$ .
19. Mass of wood M =  $5000 \text{ kg}$   
 Density of wood D =  $0.59\text{gcm}^{-3}$   
 Volume of wood V = ?  
 Formula : Volume (V) =  $\frac{\text{Mass(M)}}{\text{Density(D)}}$   

$$= \frac{5000}{0.5} = \frac{5000 \times 10}{0.5 \times 10}$$
  

$$V = 10,000\text{m}^3$$
  
 or  

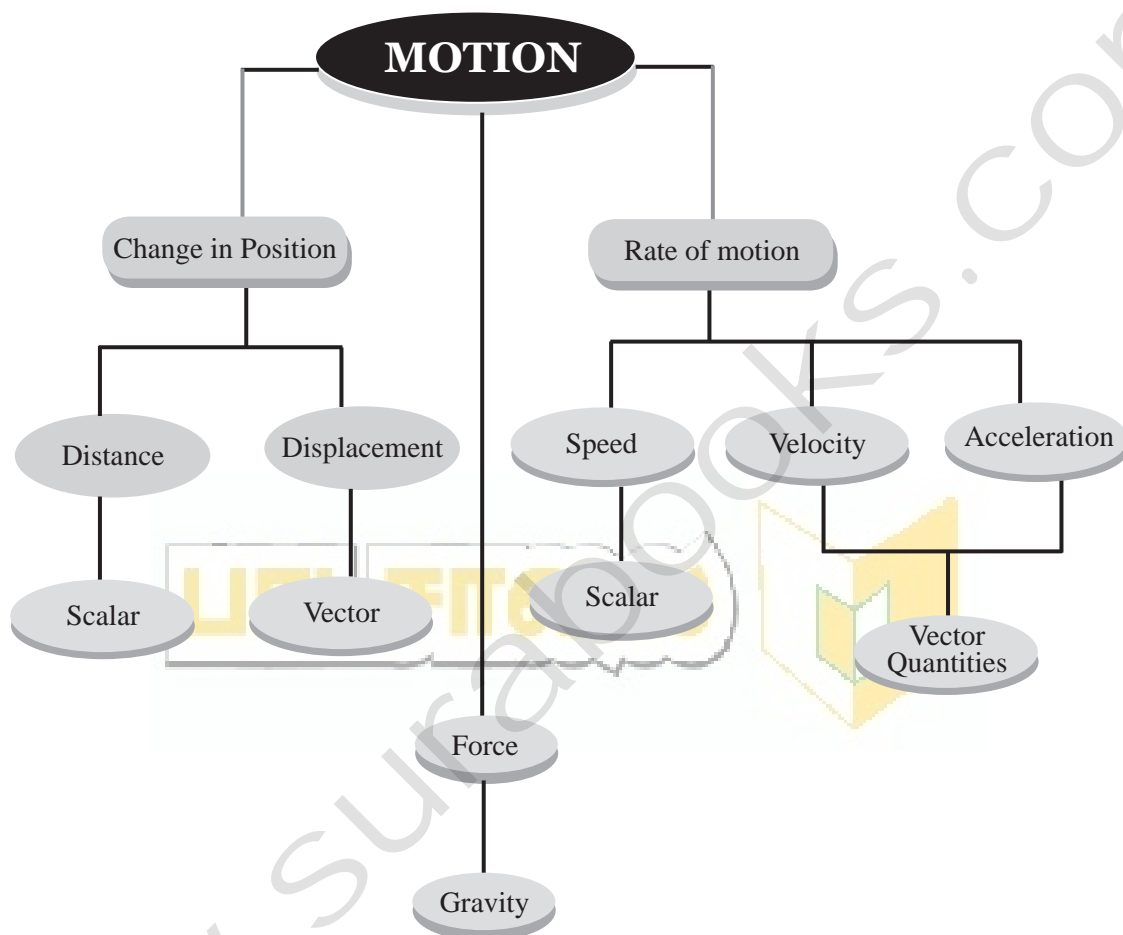
$$= 10 \times 10^3 \text{ m}^3$$
- VI. 20. a) Refer Sura's Guide Q. No. VIII - 2.  
 (or)
- b) Refer Sura's Guide Q. No. X - 1



## Unit 2

# FORCE AND MOTION

### CONCEPT MAP



### Definitions

<b>Distance</b>	:	The total length of a path taken by an object to reach one place from the other is called distance.
<b>Displacement</b>	:	The shortest distance from the initial to the final position of an object.
<b>Nautical mile</b>	:	Nautical mile is the unit for measuring the distance is the field of aviation and sea transportation.
<b>One knot</b>	:	The speed taken to travel one nautical mile in one hour.
<b>Speed</b>	:	It is the rate of change of distance.





<b>Uniform speed</b>	:	If a body in motion covers equal distances in equal intervals of time, then the body is said to be in uniform speed.
<b>Non-uniform speed</b>	:	If a body covers unequal distances in equal intervals of time, the body is said to be in non-uniform speed.
<b>Velocity</b>	:	It is the rate of change in displacement.
<b>Uniform velocity</b>	:	If a body covers equal displacement in the same direction in equal intervals of time.
<b>Non-uniform velocity</b>	:	If either speed or direction changes, the velocity is non uniform.
<b>Average velocity</b>	:	The total displacement of a body divided by the total time taken to cover that displacement.
<b>Acceleration</b>	:	It is the rate of change in velocity.
<b>Positive acceleration</b>	:	If the velocity of an object increases with respect to time, then the object is said to be in positive acceleration.
<b>Negative acceleration or deceleration or retardation</b>	:	If the velocity of an object decreases with respect to time, then the object is said to be in negative acceleration or deceleration or retardation.
<b>Uniform acceleration</b>	:	An object undergoes uniform acceleration when the change (increase or decrease) in its velocity for every unit of time is the same.
<b>Non-uniform acceleration</b>	:	An object undergoes non uniform acceleration if the change in its velocity for every unit of time is not the same.
<b>Centre of gravity</b>	:	The centre of gravity of an object is the point through which the entire weight of the object appears to act.
<b>Stability</b>	:	Stability is a measure of the body's ability to maintain its original position.

### Formulae to Remember

			Unit
1.	Speed	= $\frac{\text{Distance}}{\text{time}}$	m/s
2.	Average speed	= $\frac{\text{Total distance travelled}}{\text{time taken}}$	m/s
3.	Velocity	= $\frac{\text{Displacement}}{\text{time}}$	m/s



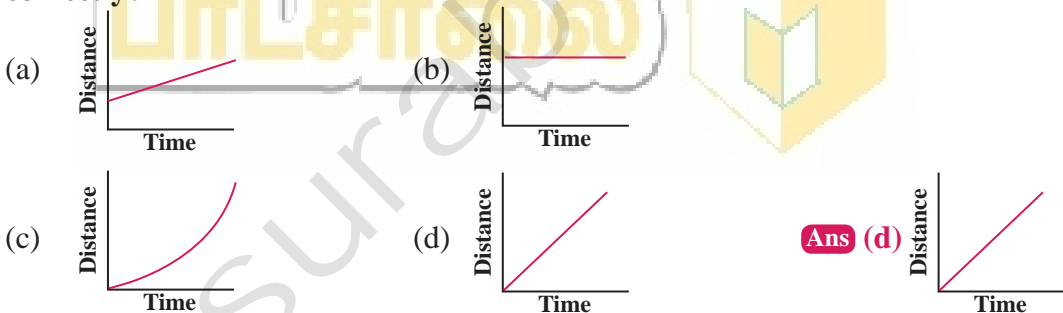
4.	Average velocity	=	$\frac{\text{Total displacement}}{\text{Time taken}}$	
5.	Acceleration	=	$\frac{\text{change in velocity}}{\text{time}} = \frac{\text{Final velocity (v)} - \text{Initial velocity (u)}}{\text{time (t)}}$ $a = \frac{v - u}{t}$ $1 \text{ km/h} = \frac{5}{18} \text{ m/s}; 1 \text{ m/s} = \frac{18}{5} \text{ km/h}$	$\text{m/s}^2$



## Evaluation

### I. Choose the best answer.

- A particle is moving in a circular path of radius  $r$ . The displacement after half a circle would be  
 (a) Zero      (b)  $R$       (c)  $2r$       (d)  $r/2$       **Ans (c)  $2r$**
- Which of the following figures represent uniform motion of a moving object correctly?



**Hint:** An object is said to be in uniform motion, when it covers equal distances in equal intervals of time.

### 3. From the given v-t graph it can be inferred that an object is

- in uniform motion
- at rest
- in non uniform motion
- moving with uniform acceleration



**Ans (d) moving with uniform acceleration**

### 4. Suppose a boy is enjoying a ride on a merry go round which is moving with a constant speed of 10m/s. It implies that the boy is.

- at rest
- moving with no acceleration
- in accelerated motion
- moving with uniform velocity

**Ans (c) in accelerated motion**



**5. How can we increase the stability of an object?**

- (a) Lowering the centre of gravity
  - (b) Raising the centre of gravity
  - (c) Increasing the height of the object
  - (d) Shortening the base of the object
- Ans (a) Lowering the centre of gravity**

**II. Fill in the blanks :**

1. The shortest distance between the two places is \_\_\_\_\_. **Ans displacement**
2. The rate of change of velocity is \_\_\_\_\_. **Ans acceleration**
3. If the velocity of an object increases with respect to time, then the object is said to be in \_\_\_\_\_ acceleration. **Ans positive**
4. The slope of the speed–time graph gives \_\_\_\_\_. **Ans acceleration**
5. In \_\_\_\_\_ equilibrium, the centre of gravity remains at the same height when it is displaced. **Ans neutral**

**III. Match the following :**

1.	Displacement	(a)	Knot
2.	Light travels through vacuum	(b)	Geometric centre
3.	Speed of ship	(c)	Metre
4.	Centre of gravity of the geometrical shaped object	(d)	Larger base area
5.	Stability	(e)	Uniform velocity

**Ans 1-c, 2-e, 3-a, 4- b, 5 - d**

**IV. Analogy :**

1. Velocity : metre/ second : : Acceleration : \_\_\_\_\_. **Ans metre/second<sup>2</sup>**
2. Length of scale : metre : : Speed of aeroplane : \_\_\_\_\_. **Ans knot**
3. Displacement / Time : Velocity : : Speed / Time : \_\_\_\_\_. **Ans acceleration**

**V. Answer very briefly.**

1. **All objects having uniform speed need not have uniform velocity. Give reason.**

**Ans.** An object moving in uniform circular motion is moving around the perimeter of the circle with a constant speed. While the speed of object is constant, its velocity is changing, Ex: Merry-go-round, roller coaster, planets orbiting the sun.

2. **A girl moves at a constant speed in the same direction. Rephrase the same sentence in fewer words using concepts related to motion.**

**Ans.** A girl moves at a straight line with constant velocity.



- 3. Correct your friend who says that acceleration gives the idea of how fast the position changes.**

**Ans.** There are two possible answers:

Velocity gives an idea of how fast the position changes. or  
 Acceleration gives an idea of how fast the velocity changes.

## VI. Answer briefly.

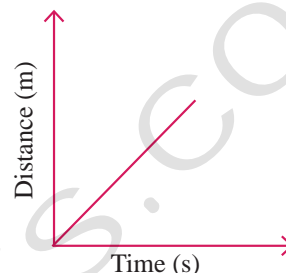
- 1. Show the shape of the distance – time graph for the motion in the following cases.**

a. A bus moving with a constant speed.

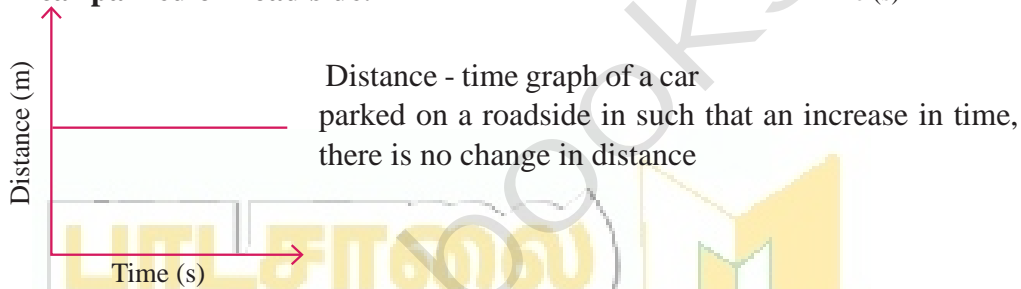
b. A car parked on a road side.

**Ans. (a) A bus moving with constant speed.**

A bus is moving with a constant speed comes equal distance in equal interval of time.



**(b) A car parked on road side.**



- 2. Distinguish between speed and velocity.**

**Ans.**

S.No	Speed	Velocity
1.	Speed is the distance travelled by an object in unit time.	Velocity is the distance travelled by an object in unit time in a given direction.
2.	Speed of a moving body can never be zero.	Velocity of a moving body will be zero, if it returns to its original position. (i.e) when its displacement is zero.
3.	It is a scalar quantity	It is a vector quantity
4.	Speed = $\frac{\text{Distance travelled}}{\text{time taken}}$	Velocity = $\frac{\text{Displacement}}{\text{time taken}}$

- 3. What do you mean by constant acceleration?**

**Ans.** A body is said to have constant acceleration, if it travels in a straight line and its velocity increases or decreases by equal magnitude in equal intervals of time.

Ex: the motion of a freely falling body.





## UNIT TEST

**Time : 60 min.**

**Marks : 25**

**I. Choose the correct answer:**

**(3 × 1 = 3)**

1. \_\_\_\_\_ is a scalar quantity.  
 (a) Speed (b) Velocity  
 (c) Displacement (d) Acceleration
2. The SI unit of acceleration is \_\_\_\_\_.  
 (a) m (b) m/s  
 (c) m/s<sup>2</sup> (d) km/h
3. The motion of a car on a crowded road is an example of \_\_\_\_\_.  
 (a) uniform speed (b) non-uniform speed  
 (c) uniform velocity (d) none

**II. Fill in the blanks.**

**(3 × 1 = 3)**

4. \_\_\_\_\_ is the rate of change of displacement.
5. If the velocity of an object increases with respect to time, then it is said to be in \_\_\_\_\_ acceleration.
6. \_\_\_\_\_ is a measure of the body's ability to maintain its original position.

**III. Give very short answer:**

7. What is retardation?
8. Write the formula to calculate velocity.
9. Can the displacement be greater than the distance travelled by an object?
10. Mention the formula to calculate average speed.

**IV. Give short answer:**

**(3 × 2 = 6)**

11. Can a body have constant speed but variable velocity?
12. Differentiate acceleration from velocity?
13. What is centre of gravity?
14. Write about the concept behind the movement of Thanjavur doll.
15. Write about neutral equilibrium.

**V. Answer the following in detail:**

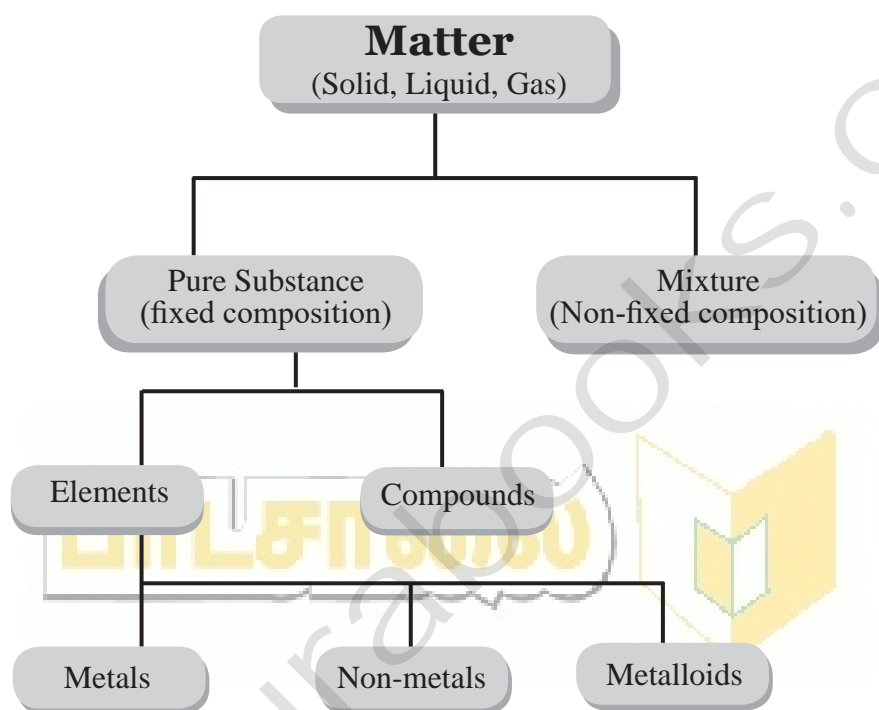
16. (a) Explain the types of stability with suitable examples.  
 (or)  
 (b) Write the differences between distance and displacement.



# Unit 3

## MATTER AROUND US

### CONCEPT MAP



### Definitions

<b>atom</b>	:	An atom is the smallest particle of an element
<b>Elements</b>	:	Elements are the simplest forms of pure substances
<b>Molecules of an element</b>	:	Molecules of an element consist of a fixed number of one type of atom
<b>Molecules of a compound</b>	:	Molecules of a compound consists of a fixed number of different types of atom
<b>Mass of the matter</b>	:	The mass of the matter remains same during expansion
<b>Molecule</b>	:	A molecule is made up of two or more atoms chemically combined



## Evaluation

### I. Choose the appropriate answer :

1. Which of the following is an example of a metal?

- (a) Iron (b) Oxygen  
(c) Helium (d) Water

**Ans (a) Iron**

2. Oxygen, hydrogen, and sulphur are examples for?

- (a) Metals (b) Non-metals  
(c) Metalloids (d) Inert gases

**Ans (b) Non-metals**

3. Which of the following is a short and scientific way of representing one molecule of an element or compound?

- (a) Mathematical formula (b) Chemical formula  
(c) Mathematical symbol (d) Chemical symbol

**Ans (d) Chemical symbol**

4. The metals which is a liquid at room temperature is

- (a) Chlorine (b) Sulphur  
(c) Mercury (d) Silver

**Ans (c) Mercury**

5. An element which is always lustrous, malleable and ductile is

- (a) non-metal (b) metal  
(c) Metalloid (d) gas

**Ans (b) metal**

### II. Fill in the blanks :

1. The smallest particle of matter that can exist by itself is \_\_\_\_\_. **Ans atom**

2. A compound containing one atom of carbon and two atoms of oxygen is \_\_\_\_\_. **Ans CO<sub>2</sub>**

3. \_\_\_\_\_ is the only non-metal conducts electricity. **Ans Graphite**

4. Elements are made up of \_\_\_\_\_ kinds of atoms. **Ans same**

5. \_\_\_\_\_ of some elements are derived from Latin or Greek names of the elements. **Ans Symbol**

6. There are \_\_\_\_\_ number of known elements. **Ans 118**

7. Elements are the \_\_\_\_\_ form of pure substances. **Ans simplest**

8. The first letter of an element always written in \_\_\_\_\_ letter. **Ans capital**

9. Molecule containing more than three atoms are known as \_\_\_\_\_. **Ans polyatomic molecule**

10. \_\_\_\_\_ is the most abundant gas in the atmosphere. **Ans Nitrogen**



### III. Analogy.

- Mercury: Liquid at room temperature:: Oxygen: \_\_\_\_\_  
**Ans** Gas at room temperature
- Non metal conducting electricity: \_\_\_\_\_ :: Metal conducting electricity: Copper  
**Ans** Graphite
- Elements: combine to form compounds:: Compounds: \_\_\_\_\_  
**Ans** can be split into elements
- Atoms: fundamental particle of an element:: \_\_\_\_\_ fundamental particles of a compound.  
**Ans** elements

### IV. State true or false. If false, give the correct statement.

- Two different elements may have similar atoms.  
**Ans.** True
- Compounds and elements are pure substances.  
**Ans.** True
- Atoms cannot exist alone. They can only exist as groups called molecules.  
**Ans.** True
- NaCl represents one molecule of sodium chloride.  
**Ans.** True
- Argon is mono atomic gas.  
**Ans.** True

### V. Answer in brief.

- Write the chemical formula and name the elements present in the following compounds:
  - Sodium chloride,
  - Potassium hydroxide,
  - Carbon dioxide,
  - Calcium oxide,
  - Sulphur dioxide

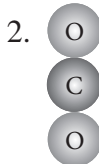
**Ans.**

		Chemical formula	Elements present
a.	Sodium chloride	NaCl	Sodium (Na), Chlorine (Cl)
b.	Potassium hydroxide	KOH	Potassium (K), Oxygen (O), Hydrogen (H)
c.	Carbon-di-oxide	CO <sub>2</sub>	Carbon (C), Oxygen (O <sub>2</sub> )
d.	Calcium oxide	CaO	Calcium (C), Oxygen (O <sub>2</sub> )
e.	Sulphur dioxide	SO <sub>2</sub>	Sulphur (S), Oxygen (O <sub>2</sub> )





**2. Classify the following molecules as the molecules of element or compound.**



**Ans.**

1.		Molecule of element
2.		Molecule of compound
3.		Molecule of element
4.		Molecule of compound

**3. What do you understand by chemical formula of a compound? What is its significance?**

- Ans. (i)** A chemical formula is a symbolic representation of one molecule of an element or a compound.
- (ii)** It provides information about the elements present in the molecule and the number of atoms of each element. The chemical formula tells us the types of atoms and the number of each type of atom in one molecule of substance.

**4. Define the following terms with an example for each.**

a. Element, b. Compound, c. Metal, d. Non-metal, e. Metalloid

**Ans. (a) Element :** It is a substance that cannot be broken down into simpler substance by chemical means Ex. : Oxygen, Hydrogen, Gold & Helium.

**(b) Compound :** A compound is a pure substance that is formed when the atoms of two or more elements combine chemically in definite proportions.  
Ex. :  $H_2O$ ,  $NaCl$ .

**(c) Metal :** A chemical element that is an effective conductor of electricity and heat can be defined as a metal. Ex. : Copper, Iron, Silver, etc.

**(d) Non-Metal :** Non-metal is an element that doesn't have the characteristics of metal including, (i.e.) ability to conduct heat or electricity luster or flexibility.  
Ex. Carbon Iodine, Sulphur.

**(e) Metalloid :** Metalloid is a chemical element that exhibits some properties of metals and some of non-metals. Metalloids are generally semi-conductors.  
Ex. : Silicon. Arsenic, Antimony and Boron.



- 5. Write the symbols for the following elements and classify them as solid, liquid and gas.**

**Aluminum, Carbon, Chlorine, Mercury, Hydrogen and Helium.**

**Ans.**

Element	Symbol	Classification
Aluminum	Al	Solid
Carbon	C	Solid
Chlorine.	Cl	Gas
Mercury.	Hg	Liquid
Hydrogen.	H	Gas
Helium	He	Gas

- 6. Classify the following as metals, non-metals and metalloids**

**Sodium, Bismuth, Silver, Nitrogen, Silicon, Carbon, Chlorine, Iron, Copper.**

**Ans.**

Metal	Non-metal	Metal	Non-metal
Sodium	Metal	Carbon	Non-metal
Bismuth	Metal	Chlorine	Non-metal
Silver	Metal	Iron	Metal
Nitrogen	Non-metal	Copper	Metal
Silicon	Metalloid		

- 7. Classify the following as elements and compounds.**

**Water, Common salt, Sugar, Carbon dioxide, Iodine and Lithium.**

**Ans.**

Elements	Compounds
Water	Compound
Common salt	Compound
Sugar	Compound
Carbon dioxide	Compound
Iodine	Element
Lithium	Element

- 8. Write the chemical formula for the following elements.**

**a. Hydrogen      b. Nitrogen      c. Ozone      d. Sulphur**

**Ans.**

Elements	Formula
Hydrogen	H
Nitrogen	N
Ozone	O <sub>3</sub>
Sulphur	S



**9. What are elements? What are they made of? Give two examples.**

- Ans. (i)** Elements are chemically the simplest substances and hence cannot be broken down using chemical reactions.
- (ii)** It is made of entirely from one type of atom.
- (iii)** Example : Hydrogen, Oxygen is made from atoms containing a single proton and a single electron.

**10. Define molecule.**

- Ans. (i)** When an atom combines with another atom (or atoms) and forms a compound it is called as molecule.
- (ii)** A molecule is made up of two or more atoms chemically combined.

**11. What are compounds? Give two examples.**

- Ans.** A compound is a pure substance that is formed when the atoms of two or more elements combine chemically in definite proportions. Example :  $H_2O$ ,  $NaCl$ ,

**12. Give an example for the elements derived from their Latin names.**

**Ans.**

Element	Latin Name	Symbol
Copper	Cuprum	Cu
Lead	Plumbum	Pb
Potassium	Kalium	K
Iron	Ferrum	Fe
Mercury	Hydrargyrum	Hg
Sodium	Natrium	Na

**13. What is atomicity of elements?**

- Ans.** Atomicity is the total number of atoms present in one molecule of an element, compound or a substance.

**14. Calculate the atomicity of  $H_2SO_4$ .**

- Ans.** A molecule of sulphuric acid ( $H_2SO_4$ ) consists of 2 hydrogen atom, 1 Sulphur atom and 4 oxygen atoms. Hence its atomicity  $2 + 1 + 4 = 7$ .

**VI. Answer in detail :**

**1. Differentiate metals and non - metals.**

Metals	Non-Metals
Metals are lustrous. They have a shiny surface	Non metals are non lustrous. They have non- shiny surface
Metals are generally hard	Non-metals are generally soft
Most metals are bendable	Non-metals are non bendable



Most metals can be bent, beaten into sheets and they can drawn into wires	Non-metals are non ductile
Most metals are good conductors of electricity	Non-metals are bad conductors of electricity
Most metals are good conductors of heat	Non-metals are bad conductors of heat
Most metals are making ringing sound when struck. Hence, they are used to make objects like bells	Non-metals does not make any sound when they struck
Ex. : Copper, Lead, Tin, Nickel	Ex. : Carbon, Iodine, Sulphur

## 2. Explain the characteristics of compounds.

- Ans. (i)** A compound is formed only when the constituent elements combine in a fixed proportion.
- (ii)** The properties of a compound are different from those of its constituent elements
- (iii)** A compound cannot be broken down by physical methods.
- (iv)** This is because a compound is made up of different elements that are chemically combined. Sodium chloride cannot be separated by physical methods such as filtration.
- (v)** A compound can be separated into its constituent elements by chemical methods only.

## 3. Describe the different ways in which we can write the symbols of elements. Give appropriate examples.

**Ans. The following rules are followed while assigning symbol to an elements:**

- (i)** Chemical symbols usually consist of one or two letters.
- (ii)** The symbols of most elements correspond to the first letter (which is capitalized) of their English name. For example, the symbol for oxygen is "O" and that for hydrogen is "H".
- (iii)** When there is more than one element that begins with the same letter, their symbols take two letters.
- (iv)** The first letter is capitalised while the second letter has a lower case.
- (v)** For example, the names of both hydrogen and helium begin with H. So, hydrogen is represented by the symbol H and Helium by He.

**Example :**

Element	Symbol	Element	Symbol
Hydrogen	H	Phosphorus	P
Fluorine	F	Sulphur	S
Aluminium	Al	Chromium	Cr
Argon	Ar	Cobalt	Co





## UNIT TEST

**Time : 60 min.**

**Marks : 25**

**I. Choose the correct answer:**

**(3 × 1 = 3)**

**1. Which of the following is an example of a non-metal?**

- |               |            |
|---------------|------------|
| (a) Hydrogen  | (b) Copper |
| (c) Aluminium | (d) Iron   |

**2. \_\_\_\_\_ is a substance that is made up of three Oxygen atoms chemically combined.**

- |              |                     |
|--------------|---------------------|
| (a) Hydrogen | (b) Oxygen          |
| (c) Ozone    | (d) CO <sub>2</sub> |

**3. \_\_\_\_\_ was the first scientist to use the symbols for elements in a very specific sense.**

- |             |                  |
|-------------|------------------|
| (a) Dalton  | (b) Lavoisier    |
| (c) Thomson | (d) Both b and c |

**II. Fill in the blanks.**

**(3 × 1 = 3)**

**4. Chemical formula of water is H<sub>2</sub>O. Here 2 is called \_\_\_\_\_.**

**5. The mass of the matter remains \_\_\_\_\_ during expansion.**

**6. \_\_\_\_\_ of some elements are derived from Latin or Greek names of the elements.**

**III. Give very short answer:**

**(4 × 2 = 8)**

**7. What is atomicity?**

**8. Define molecule.**

**9. Write the chemical formula of Ozone and Nitrogen.**

**10. Write the expansion of IUPAC.**

**IV. Give short answer:**

**(3 × 2 = 6)**

**11. Why do hot air balloons float?**

**12. Classify the following as metals, non-metals, and metalloids.**

Sodium, Bismuth, Silver, Nitrogen, Silicon, Chlorine.

**13. Write the symbols for the following elements and classify them as solid, liquid and gas.**

Aluminium, Carbon, Chlorine, Mercury, Hydrogen and Helium.



**14.** Complete the table :

Element	Latin Name	Symbol
(i)	Cuprum	(ii)
(iii)	(iv)	K

**15.** What are metalloids. Give example.

**V. Answer the following in detail:**

**(5 × 1 = 5)**

**16.** Differentiate metals and non-metals.

(or)

**17.** Write down the properties of metalloids.



## Answer Key

I (1) (a) Hydrogen (2) (c) Ozone

(3) (a) Dalton

II (4) subscript (5) same

(6) symbol

III 7. Refer Sura's Guide Q. No. V - 13.

8. Refer Sura's Guide Q. No. V - 10.

9. O<sub>3</sub>, N.

10. Refer Sura's Guide Q. No. V - 4.

IV. 11. Refer Sura's Guide Q. No. VI - 10.

12. Refer Sura's Guide Q. No. V - 6.

13. Refer Sura's Guide 51, Q. No. V - 5.

14. (i). Copper (ii) Cu (iii) Potassium (iv) Kalium.

15. Refer Sura's Guide Q. No. VI - 6.

IV. 16. Refer Sura's Guide Q. No. VI - 1.

17. Refer Sura's Guide Q. No. VI - 7.



## SURA'S MODEL SUMMATIVE ASSESSMENT

**7<sup>th</sup>**  
**STD**

Time : 2.00 hrs.

### TERM-I **SCIENCE** with Answers

Reg. No.

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Marks : 60

#### I. Choose the correct answer :

**10×1= 10**

1. Which of the following is correct?  
 (a) 1L = 1cc                      (b) 1L = 10cc                      (c) 1L = 100cc                      (d) 1L = 1000cc
2. Light year is the unit of  
 (a) Distance                                              (b) time  
 (c) density                                              (d) both length and time
3. How can we increase the stability of an object?  
 (a) Lowering the centre of gravity                      (b) Raising the centre of gravity  
 (c) Increasing the height of the object                      (d) Shortening the base of the object
4. Oxygen, hydrogen, and sulphur are examples for?  
 (a) Metals                                              (b) Non-metals  
 (c) Metalloids                                              (d) Inert gases
5. The subatomic particle which revolve around the nucleus is \_\_\_\_\_  
 (a) atom                      (b) neutron                      (c) electron                      (d) proton
6. Nucleons comprises of \_\_\_\_\_  
 (a) protons and electrons                      (b) neutrons and electrons  
 (c) protons and neutrons                      (d) neutrons and Positron
7. Asexual reproduction in yeast is  
 (a) spore formation                                              (b) fragmentation  
 (c) pollination                                              (d) budding
8. Climbing roots are seen in  
 (a) betel                                              (b) black pepper  
 (c) Both of them                                              (d) None of them
9. Our living place should be  
 (a) open                      (b) closed                      (c) clean                      (d) unclean / Untidy
10. Who uses the photoshop software more ?  
 (a) Teacher                                              (b) Doctor  
 (c) Painter                                              (d) Photographer

#### II. Answer any 15 questions :

**15×2= 30**

11. State whether the following statements are true or false.  
 a) Density is defined as the mass of the substance contained in unit volume.  
 b) We must eat lot of carrots to prevent eye diseases.
12. Name the liquid in which an iron ball sinks.
13. What is centre of gravity ?

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## 7th Std ○ Science ○ Sura's Model Summative Term I Question paper

14. Fill in the blanks :

- a) The \_\_\_\_\_ revolve around the nucleus.
- b) The area of a leaf can be measured using a \_\_\_\_\_

15. Analogy :

- a) Area:  $M^2$  :: Volume : \_\_\_\_\_
- b) Water : Kerosene :: \_\_\_\_\_ : Aluminium

16. Give the expansions of IUPAC.

17. Assertion – Reason

Option:

- (a) Both assertion and reason are true and reason is the correct explanation of assertion.
- (b) Both assertion and reason are true, but reason is not the correct explanation of assertion.
- (c) Assertion is true but reason is false
- (d) Assertion is false but reason is true.

a) Assertion (A) : Wood floats in water.

Reason (R) : Water is a transparent liquid.

b) Assertion (A) : The number of protons and neutrons is atomic number.

Reason (R) : The mass number is sum of protons and neutrons.

18. Give an example for the elements derived from their Latin names.

19. Why neutrons are called neutral particles?

20.

1.	Co <sub>2</sub>	(a)	Robert Boyle
2.	Sulphur	(b)	Making mobile phones
3.	Element	(c)	triatomic molecule
4.	Gallium	(d)	Polyatomic molecule

21. What do you understand by chemical formula of a compound? What is its significance?

22. (a) The positively charged particle is \_\_\_\_\_ .

(b) The negatively charged particle is \_\_\_\_\_

23. Analogy :

Mercury: Liquid at room temperature:: Oxygen: \_\_\_\_\_

Elements: combine to form compounds:: Compounds: \_\_\_\_\_

24. The atomic number of an element is 9. It has 10 neutrons. Find the element from the periodic table. What will be its mass number?

25. Calculate the atomicity of H<sub>2</sub>SO<sub>4</sub>.

26. Match the following :

1.	Vanda	(a)	Climber
2.	Pea	(b)	epiphyte
3.	Eicchornia	(c)	offset
4.	wild strawberry	(d)	Runner stolon

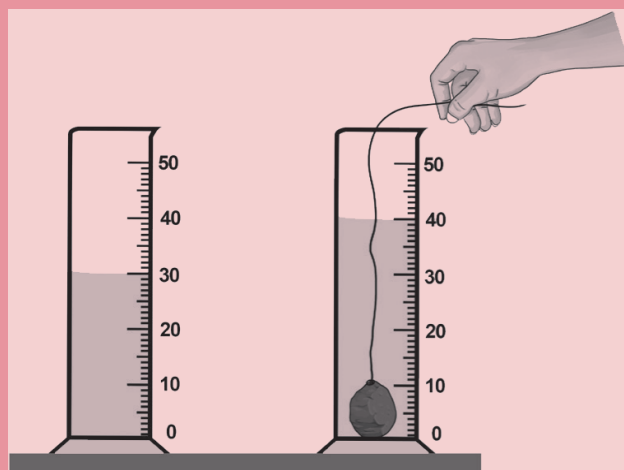


- $$5 \times 4 = 20$$

- ★★★★★

## 125

# TERM



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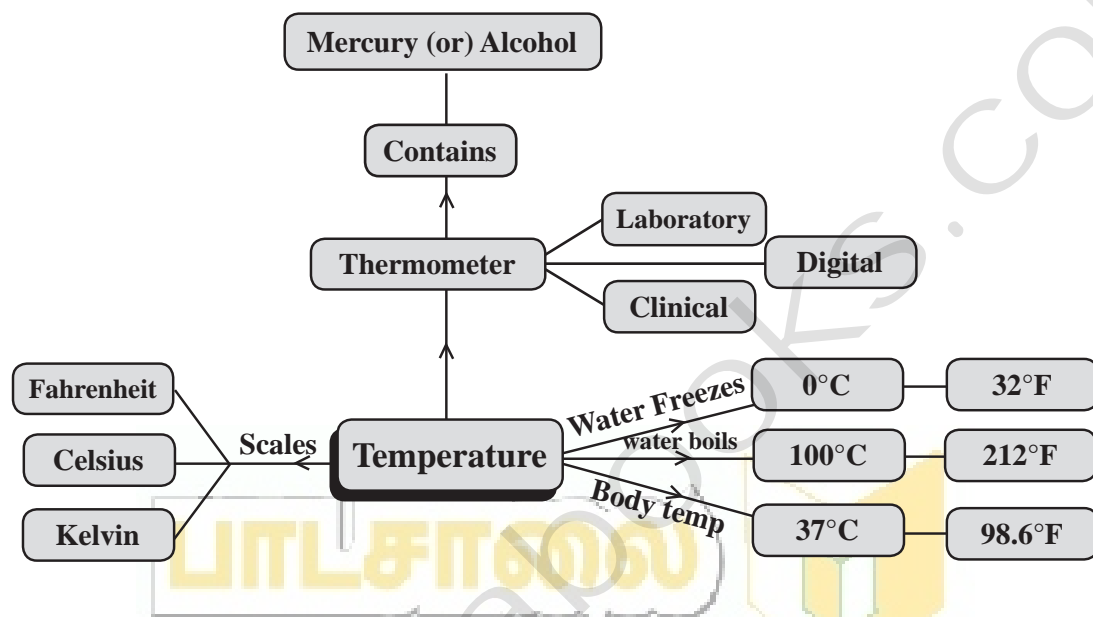
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# Unit 1

# HEAT AND TEMPERATURE

## CONCEPT MAP



## Must Know Definitions

Temperature	:	The measurement of warmness or coolness of a substance.
Thermometer	:	The most common instrument to measure temperature.
Kelvin scale	:	It is the SI unit of measuring temperature.
Fahrenheit scale	:	Fahrenheit is a common unit to measure human body temperature.
Celsius scale	:	Celsius is the common unit of measuring temperature.

## Formulae to Remember

- To convert Fahrenheit into Celsius:  $C = (F - 32) \times \frac{5}{9}$
- To convert Celsius in to Fahrenheit:  $F = \frac{9C}{5} + 32$
- To convert Celsius in to Kelvin:  $K = C + 273.15$



## Evaluation

### I. Choose the correct answer:

- International unit of measuring temperature is \_\_\_\_\_.  
 (a) Kelvin (b) Fahrenheit  
 (c) Celsius (d) Joule **Ans (a) Kelvin**
- In thermometer when bulb comes in contact with hot object, liquid inside it  
 (a) expands (b) contracts  
 (c) remains same (d) none of above **Ans (a) expands**
- The body temperature of a healthy man is;  
 (a) 0°C (b) 37°C (c) 98°C (d) 100°C **Ans (b) 37°C**
- Mercury is often used in laboratory thermometers because it \_\_\_\_\_.  
 (a) is a harmless liquid  
 (b) is silvery in colour and is attractive in appearance  
 (c) Expands uniformly  
 (d) is a low cost liquid **Ans (c) Expands uniformly**
- Which of the following temperature conversions is incorrect  

$$K \text{ (Kelvin)} = ^\circ C \text{ (Celsius)} + 273.15$$

$^\circ C$	K
(a) -273.15	0
(b) -123	+150.15
(c) +127	+400.15
(d) +450	+733.15

**Ans (d) +450, +733.15**

### II. Fill in the blanks:

- Doctor uses \_\_\_\_\_ thermometer to measure the human body temperature. **Ans clinical**
- At room temperature Mercury is in \_\_\_\_\_ state. **Ans liquid**
- Heat energy transfer from \_\_\_\_\_ to \_\_\_\_\_.  
**Ans higher temperature region, lower temperature region**
- 7°C temperature is \_\_\_\_\_ than 0°C temperature. **Ans less**
- The common laboratory thermometer is a \_\_\_\_\_ thermometer **Ans mercury**

### III. Match the following:

i)	Clinical thermometer	A form of energy
ii)	Normal temperature of human body	100°C
iii)	Heat	37°C
iv)	Boiling point of water	0°C
v)	Melting point of water	Kink





**Ans.**

i)	Clinical thermometer	Kink
ii)	Normal temperature of human body	37°C
iii)	Heat	A form of energy
iv)	Boiling point of water	100°C
v)	Melting point of water	0°C

#### **IV. Give very short answer:**

- 1. Temperature of Srinagar (J&K) is  $-4^{\circ}\text{C}$  and in Kodaikanal is  $3^{\circ}\text{C}$  which of them has greater temperature ? What is the difference between the temperatures of these two places?**

**Ans.** Kodaikanal has greater temperature.

$$\text{Temperature of srinagar (J \&K)} = -4^{\circ}\text{C}$$

$$\text{Temperature of kodaikanal} = 3^{\circ}\text{C}$$

$$\text{Difference} = -4^{\circ}\text{C} + 3^{\circ}\text{C}$$

$$= 7^{\circ}\text{C}$$

Srinagar is colder than that of kodaikanal.

- 2. Jyothi was prepared to measure the temperature of hot water with a clinical thermometer. Is it right or wrong? Why?**

**Ans.** It is wrong, because clinical thermometer has small temperature range ( $35^{\circ}\text{C}$  to  $42^{\circ}\text{C}$  or  $94^{\circ}\text{F}$  to  $108^{\circ}\text{F}$ ). If it is used to measure the temperature of hot water, the glass will crack/ burst due to excessive pressure created by expansion of mercury.

- 3. A clinical thermometer is not used to measure the temperature of air, why?**

**Ans.** The range of the clinical thermometer is less than that of thermometer used to measure temperature of air.

- 4. What is the use of kink in clinical thermometer?**

**Ans.** A kink in clinical thermometer prevents the mercury from flowing back into the bulb when the thermometer is taken out of the patient's mouth, so that the temperature can be noted conveniently.

- 5. Why do we jerk a clinical thermometer before we measure the body temperature?**

**Ans.** The jerk to the thermometer will allow the mercury level to flow into the bulb so that the mercury level is below the normal temperature.

#### **V. Give Short Answer:**

- 1. Why do we use mercury in thermometers? Can water be used instead of mercury? What are the problems in using it?**

**Ans.** (i) We use mercury in thermometers as they remain in liquid form even with a change of temperature in it.

(ii) A small change in the temperature causes change in volume of a liquid.



- (iii) Water cannot be used as a thermometric liquid, because it is not helpful to measure below  $0^{\circ}\text{C}$  and above  $100^{\circ}\text{C}$ .
- (iv) Water is transparent. So it makes the reading of the scales of the thermometer more difficult, water wets the glass tube so its **steady** is glass tube.
- (v) Due to this constraints it is not used as a thermometric liquid.

**2. Swathi kept a laboratory thermometer in hot water for some time and took it out to read the temperature. Ramani said it was a wrong way of measuring temperature. Do you agree with Ramani? Explain your answer.**

**Ans.** Yes, I agree with Ramani.

- (i) Laboratory thermometer does not have a kink. So, when Swathi takes out the thermometer, the level can go back because of absence of kink.
- (ii) So Swathi should note the reading when the thermometer bulb has surrounded by hot water.

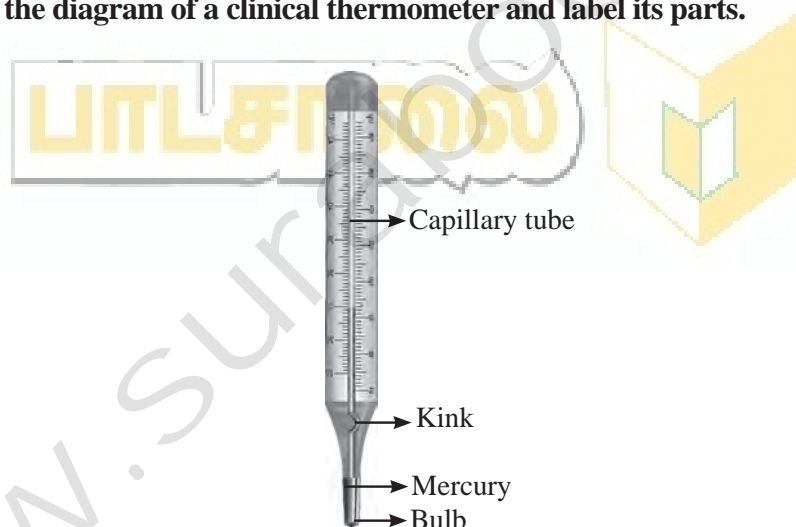
**3. The body temperature of Srinath is  $99^{\circ}\text{F}$ . Is he suffering from fever? If so, why?**

**Ans.** Srinath is having a fever because the normal body temperature is  $98.6^{\circ}\text{F}$ .

## **VI. Give long answer:**

**1. Draw the diagram of a clinical thermometer and label its parts.**

**Ans.**



**2. State the similarities and differences between the laboratory thermometer and the clinical thermometer.**

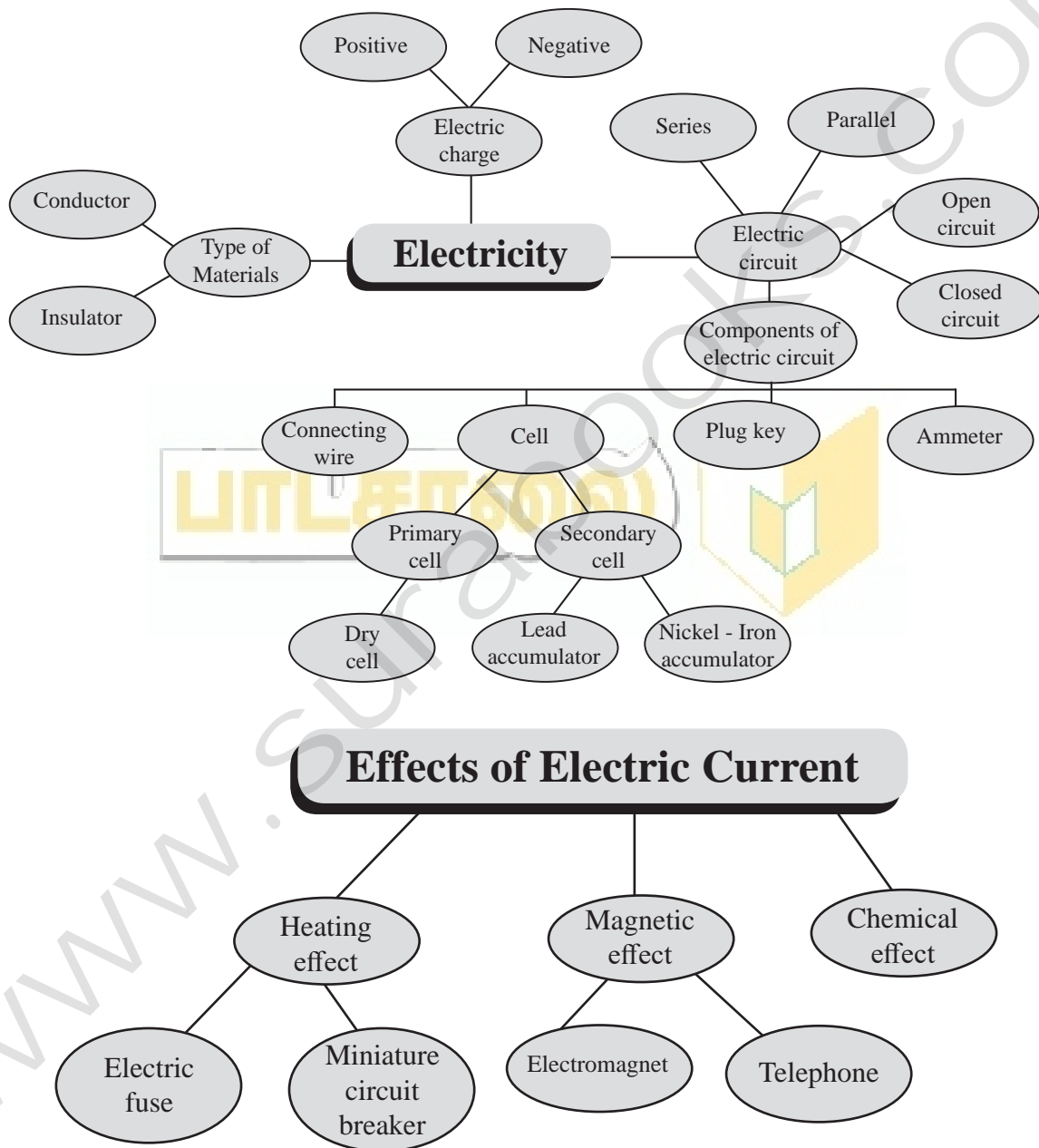
**Ans. Similarities between laboratory thermometer and the clinical thermometer:**

- (i) Both clinical and laboratory thermometers have long, narrow and uniform glass tubes.
- (ii) Bulbs contain mercury.
- (iii) Both have celsius scale.

## Unit 2

# ELECTRICITY

### CONCEPT MAP





## Must Know Definitions

<b>Electric current</b>	:	An electric current is a flow of electric charge or the amount of charge flowing through a given cross section of a material in unit time.
<b>One ampere</b>	:	One ampere is defined as the flow of electric charge across a surface at the rate of one coulomb per second.
<b>Electric cell</b>	:	The cell is the basic single electrochemical unit which converts chemical energy to electrical energy.
<b>Battery</b>	:	Batteries are a collection of one or more cells whose chemical reactions create a flow of electrons in a circuit
<b>Ammeter</b>	:	An instrument for measuring the flow of electrical current in amperes. Ammeters are always connected in series with the circuit to be tested.
<b>Ampere</b>	:	A unit of measure for the intensity of an electric current flowing in a circuit. One ampere is equal to a current flow of one coulomb per second.
<b>Circuit</b>	:	A closed path in which electrons from a voltage or current source flow.
<b>Fuse</b>	:	A circuit interrupting device consisting of a strip of wire that melts and breaks an electric circuit if the current exceeds a safe level.
<b>Electrical conductivity or Specific conductance</b>	:	Electrical conductivity or specific conductance is the measure of a material's ability to conduct an electric current.
<b>Electrical resistivity</b>	:	Electrical resistivity is a fundamental property of a material that quantifies how strongly that material opposes the flow of electric current.
<b>Electrolyte</b>	:	A substance that dissociates into ions in solution and acquires the capacity to conduct electricity.
<b>Resistance</b>	:	An electrical component resists or hinders the flow of electric charges, when it is connected in a circuit.
<b>Series circuit</b>	:	Circuit that has only one closed path through which the electric current flows.
<b>Parallel circuit</b>	:	Circuit that offers more than one path for the flow electric current.



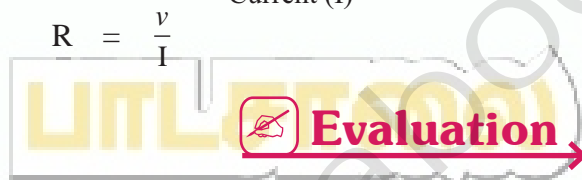
<b>Conductors</b>	:	Any material where electric current can flow freely.
<b>Insulators</b>	:	Any material where electric current does not flow freely.
<b>Electromagnet</b>	:	An electromagnet is a type of magnet in which the magnetic field is produced by an electric current.
<b>Short circuit</b>	:	When one part of an electric circuit comes in contact with another part of the same circuit, diverting the flow of current from its desired path.

## Formulae to Remember

- Current  $I = \frac{\text{charge (q)}}{\text{time (t)}}$   

$$I = \frac{q}{t}$$
- Resistance  $R = \frac{\text{Potential difference (v)}}{\text{Current (I)}}$   

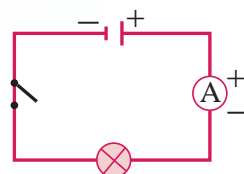
$$R = \frac{v}{I}$$



### I. Choose the correct answer :

- In the circuit diagram below, 10 units of electric charge move past point x every second. What is the current in the circuit?

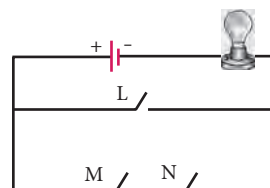
- \_\_\_\_\_.
- (a) 10 A                                      (b) 1 A  
 (c) 10 V                                      (d) 1 V



**Ans (a) 10 A**

- In the circuit shown, which switches (L, M or N) must be closed to light up the bulb?

- (a) switch L only  
 (b) switch M only  
 (c) Switch M and N only  
 (d) either switch L or switches M and N



**Ans (d) either switch L or switches M and N**

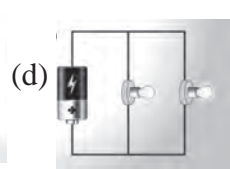
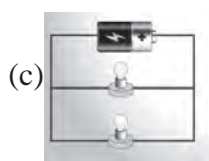
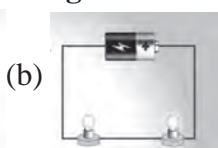
- Small amounts of electrical current are measured in milliampere (mA). How many milliampere are there in 0.25 A ?

- (a) 2.5 mA    (b) 25 mA    (c) 250 mA    (d) 2500 mA    **Ans (c) 250 mA**

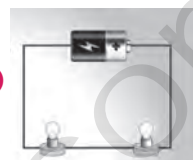




- 4. In which of the following circuits are the bulb connected in series?**



**Ans (b)**



## II. Fill in the blanks :

- The direction of conventional current is \_\_\_\_\_ to electron flow. **Ans Opposite**
- One unit of coulomb is charge of approximately \_\_\_\_\_ protons or electrons.. **Ans  $6.242 \times 10^{18}$**
- \_\_\_\_\_ is used to measure the electric current. **Ans Ammeter**
- In conducting materials electrons are \_\_\_\_\_ bounded with atoms. **Ans loosely**
- S.I. unit of Electrical conductivity of a conductor is \_\_\_\_\_. **Ans siemens/metre(s/m)**

## III. True or False – If False give the correct answer :

- Electron flow is in the same direction to conventional current flow.**  
**Ans.** False. Electron flow is in the **opposite** direction to conventional current flow.
- The fuse wire does not melts whenever there is overload in the wiring.**  
**Ans.** False. The fuse wire melts whenever there is overload in the wiring.
- In a parallel circuit, the electric components are divided into branches.**  
**Ans.** True.
- The representation of the electric current is A.**  
**Ans.** False. The representation of the electric current is **I**.
- The electrical conductivity of the semiconductor is in between a conductor and an insulator.**  
**Ans.** True.

## IV. Match the following :

1. Cell	used to open or close a circuit
2. Switch	safety device used in electric circuit
3. Circuit	A complete path for the flow of an electric current
4. Miniature circuit Breaker	Reset by hand, circuit becomes complete once again
5. Fuse	A device which converts chemical energy into electrical energy



**Ans.**

1.	Cell	A device which converts chemical energy into electrical energy
2.	Switch	used to open or close a circuit
3.	Circuit	A complete path for the flow of an electric current
4.	Miniature circuit Breaker	Reset by hand, circuit becomes complete once again
5.	Fuse	safety device used in electric circuit

### V. Analogy :

- Water : pipe : : Electric current : \_\_\_\_\_ **Ans** wire
- Copper : conductor : : Wood : \_\_\_\_\_ **Ans** insulator
- Length : metre scale : : Current : \_\_\_\_\_ **Ans** ammeter
- milli ampere: micro ampere : :  $10^{-3}\text{A}$  : \_\_\_\_\_ **Ans**  $10^{-6}\text{A}$

### VI. Assertion and Reason :

- Assertion (A) :** Copper is used to make electric wires.

**Reason (R) :** Copper has very low electrical resistance.

**Option:**

- Both A and R are true and R is the correct explanation of A.
- Both A and R are true but R is NOT the correct explanation of A.
- A is true but R is false.
- A is false but R is true.
- Both A and R are false

**Ans (A) Both A and R are true and R is the correct explanation of A**

- Assertion (A) :** Insulators do not allow the flow of current through themselves.

**Reason (R) :** They have no free charge carriers.

- Both A and R are true and R is the correct explanation of A.
- Both A and R are true but R is NOT the correct explanation of A.
- A is true but R is false.
- A is false but R is true.
- Both A and R are false

**Ans (A) Both A and R are true and R is the correct explanation of A.**

### VII. Very short answer :

- What is the speed of electric current?**

**Ans.** Current travels at the speed of  $1/100\text{th}$  times the speed of light  $0.0002\text{ m/s}$ .

- What is the S.I unit of electrical conductivity?**

**Ans.** The SI unit of electrical conductivity is Siemens / metre (s/m).



**3. Name the device used to generate electricity.**

**Ans.** Electric cell.

**4. Define fuse.**

**Ans.** Electric fuse is a safety device which is used in household wiring and in many appliances.

**5. Name some devices that run using heat effect of electric current**

**Ans.** Electric bulb, geyser, Iron box.

**6. Name few insulators.**

**Ans.** Rubber, wood, plastic, glass.

**7. What is a battery?**

**Ans.** Batteries are a collection of one or more cells whose chemical reactions create a flow of electrons in a circuit.

### **VIII. Short Answer :**

**1. Define an electric current.**

**Ans.** An electric current is measured by the amount of electric charge moving per unit time at any point in the circuit. The conventional symbol for current is 'I'.

**2. Differentiate parallel and series circuits.**

**Ans.**

S.No	Parallel circuits	Series circuits
1.	It is connected by branches.	It consist of single loop connection.
2.	Voltage remains the same across each component of the circuit	Current remains same in all parts of the circuit.
3.	Each bulb is fully powered.	All the bulbs share power.
4.	All bulbs stay lit if one goes out.	All bulbs go out if one goes out.

**3. Define electrical conductivity.**

**Ans.** Electrical conductivity or specific conductance is the measure of a material's ability to conduct an electric current.

### **IX. Long Answer :**

**1. Explain the construction and working of an Telephone.**

**Ans.** In telephones, a changing magnetic effect causes a thin sheet of metal (diaphragm) to vibrate. The diaphragm is made up of a metal that can be attracted to magnets.

- (i) The diaphragm is attached to spring that is fixed to the earpiece.
- (ii) When a current flows through the wires, the soft – iron bar becomes an electromagnet.
- (iii) The diaphragm becomes attracted to the electromagnet.
- (iv) As the person on the other end of the line speaks, his voice cause the current in the circuit to change. This causes the diaphragm in the earpiece to vibrate, producing sound.

**UNIT TEST**

Time : 60 min.

Marks : 20

**I. Choose the correct answer:****(2 × 1 = 2)**

1. \_\_\_\_\_ cell is used to operate devices such as mobile phones, computers and emergency lights.

- (a) Primary cell (b) Secondary cell  
(c) Lithium cell (d) none

2. Electricians wear rubber gloves because it is \_\_\_\_\_.

- (a) soft (b) an insulator  
(c) conductor (d) water proof

**II. Fill in the blanks.****(2 × 1 = 2)**

3. \_\_\_\_\_ are used to remove splinters of steel or iron in hospitals dealing with eye injuries.

4. The direction of conventional current is \_\_\_\_\_ to electron flow.

**III. Write true or false:****(1 × 1 = 1)**

5. An MCB can be used instead of a fuse in an electrical circuit.

**IV. Give very short answer:****(3 × 1 = 3)**

6. Name some devices that run using heating effect of electric current.

7. What are the effects of electricity?

8. What is the SI unit of electrical conductivity?

**V. Give short answer:****(2 × 2 = 4)**

9. Define an electric current.

10. What do you mean by an open circuit?

**VI. Answer the following in detail:****(2 × 4 = 8)**

11. Explain the construction and working of a dry cell.

12. Write the difference between primary cell and secondary cell.



## SURA'S MODEL SUMMATIVE ASSESSMENT

**7<sup>th</sup>**  
**STD**

Time : 2.00 hrs.

### TERM-II **SCIENCE** with Answers

Reg. No.

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Marks : 60

#### I. Choose the correct answer :

**10×1= 10**

1. Mercury is often used in laboratory thermometers because it \_\_\_\_\_.  
 (a) is a harmless liquid  
 (b) is silvery in colour and is attractive in appearance  
 (c) Expands uniformly  
 (d) is a low cost liquid
2. The measure of degree of hotness or coldness of a body is called \_\_\_\_\_.  
 (a) heat energy                      (b) celsius                      (c) kelvin                      (d) temperature
3. Small amounts of electrical current are measured in milliampere (mA). How many milliampere are there in 0.25 A ?  
 (a) 2.5 mA                      (b) 25 mA                      (c) 250 mA                      (d) 2500 mA
4. The chemical change is \_\_\_\_\_.  
 (a) water to clouds                      (b) growth of a tree  
 (c) cow dung to bio-gas                      (d) ice-cream to molten ice-cream.
5. Vanaspathi is obtained from vegetable oils by addition of \_\_\_\_\_ to the oils.  
 (a) oxygen                      (b) hydrogen  
 (c) carbon di oxide                      (d) nitrogen
6. \_\_\_\_\_ helps in cell division.  
 (a) Endoplasmic reticulum                      (b) Golgi complex  
 (c) Centriole                      (d) Nucleus
7. Starch is stored in \_\_\_\_\_.  
 (a) chloroplast                      (b) leucoplast  
 (c) chromoplast                      (d) Golgi apparatus
8. The largest division of the living world is \_\_\_\_\_.  
 (a) Order                      (b) Kingdom                      (c) Phylum                      (d) Family
9. Plant is a thallus in \_\_\_\_\_.  
 (a) Algae                      (b) Ferns                      (c) Bacteria                      (d) Pinus
10. What is the shortcut key for print option?  
 (a) Ctrl + S                      (b) Ctrl + O  
 (c) Ctrl + P                      (d) Ctrl + Y

#### II. Answer any 15 questions :

**15×2= 30**

11. State whether the following statements are true or false.  
 a) Temperature is related to how fast the atoms within a substance are moving.  
 b) In a parallel circuit, the electric components are divided into branches.
12. Name the device used to generate electricity.



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### 7th Std ○ Science ○ Sura's Model Summative Term II Question paper

13. A clinical thermometer is not used to measure the temperature of air, why?
14. Fill in the blanks :
  - a) At room temperature Mercury is in \_\_\_\_\_ state.
  - b) In conducting materials electrons are \_\_\_\_\_ bounded with atoms.
15. Analogy :
  - a) Water : pipe :: Electric current : \_\_\_\_\_
  - b) Length : metre scale :: Current : \_\_\_\_\_
16. Give the expansions of MCB
17. Assertion – Reason
 

Option:


  - (a) Both A and R are true and R is the correct explanation of A.
  - (b) Both A and R are true but R is the not the correct explanation of A.
  - (c) A is true but R is false.
  - (d) A is false but R is true.
  - a) Assertion (A) : Charges flow from higher potential to the lower potential.  
Reason (R) : Current flows mainly due to flow of electrons.
  - b) Assertion (A) : The connecting wires are made of copper.  
Reason (R) : The electrical conductivity of copper is high.
18. We are advised to avoid keeping clinical thermometer in the sun or near a flame. Why?
19. Define an electric current.
- 20.

	Column I		Column II
1.	Folding of paper	(a)	Crystallization
2.	Oxidation	(b)	Can be reversed
3.	Zinc coating	(c)	Cut apples
4.	Solid in pure form	(d)	Galvanisation

21. What type of energy changes is associated when ice melts?
22.
  - (a) Spoiling of food is a \_\_\_\_\_ change.
  - (b) Respiration is a \_\_\_\_\_ change.s
23. Analogy :
 

Wood to saw dust: \_\_\_\_\_ :: Wood to Ash: Chemical change

Forest fire: \_\_\_\_\_ change::Change in period in a school: periodic change
24. Picture based Questions:
 

- (a) 
  - (b)
  - (c)

.....

.....

.....
25. How can a change occur in a substance?

1.	Epithelium	(a)	Contract
2.	Nerve cell	(b)	Carry respiratory gases
3.	RBC	(c)	Protection
4.	Muscle cell	(d)	Conduct messages

- Bacteria is a animal cell.
- Amoeba contains chloroplasts.

30. Which kingdom has saprophytic, parasitic and symbiotic nutrition. Why?

$$5 \times 4 = 20$$

37. Which kingdom has saprophytic, parasitic and symbiotic nutrition. Why?

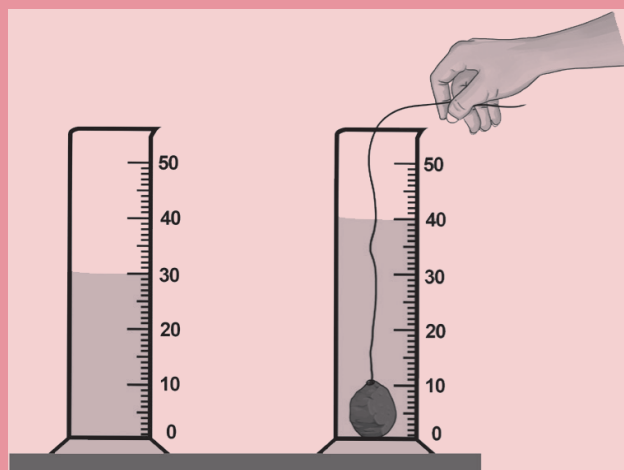
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I.

1. (c) Expands uniformly	2. (d) temperature
3. (c) 250 mA	4. (c) cow dung to bio-gas
5. (b) hydrogen	6. (c) Centriole
7. (b) leucoplast	8. (b) Kingdom
9. (a) Algae	10. (c) Ctrl + P

## 16. MCB : Miniature Circuit Breakers

# TERM



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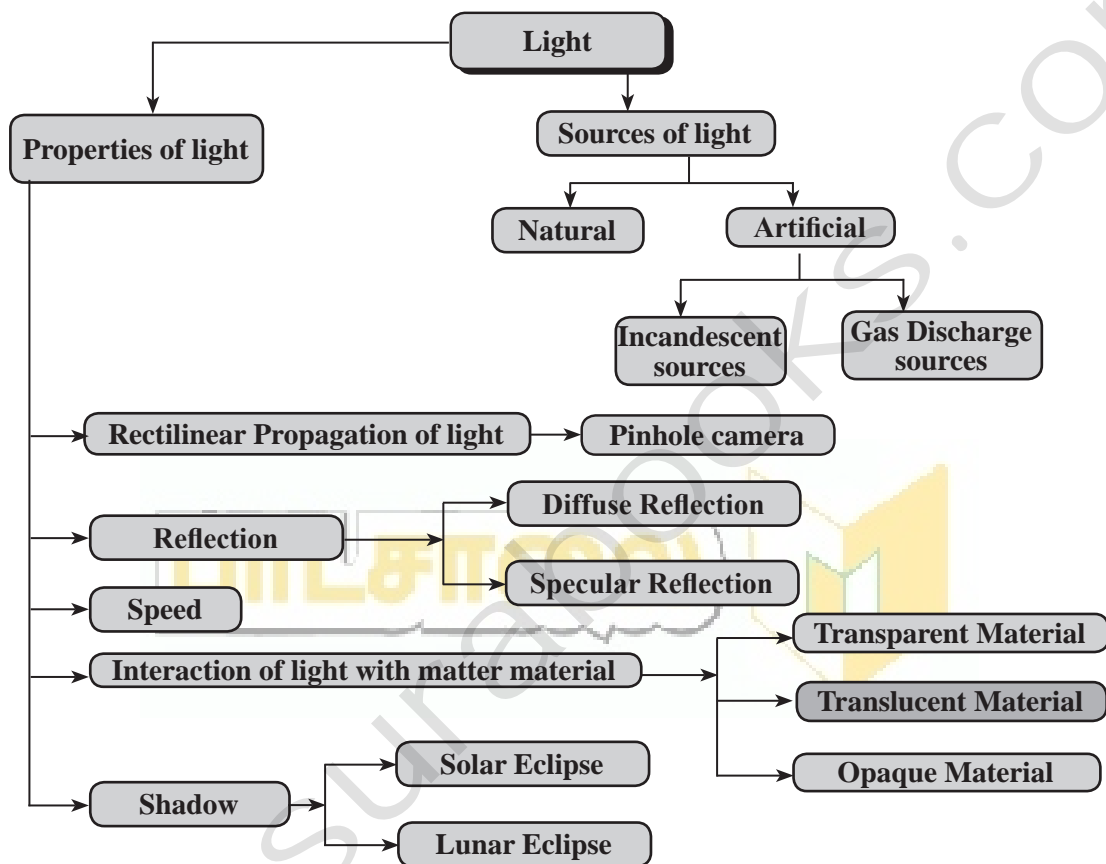
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# Unit 1

# LIGHT

## CONCEPT MAP



## Must Know Definitions

Light sources	:	Objects which are able to emit light are known as <b>light sources</b> .
Natural sources of light	:	Sources which emit light naturally are known as <b>natural sources of light</b> .
Rectilinear propagation of light	:	Light travels in straight line, it cannot bend the path itself.
Reflection	:	The bouncing back of light from a reflecting surface is called <b>reflection</b> .
Incident ray	:	The ray of light that falls on the surface of the reflection materials.





Reflected Ray	:	The ray of light that comes from the point when the incident ray falls on the reflection materials.
Point of incidence	:	The point of which are incident ray strikes the reflecting surface is the point of incidence.
Normal	:	The perpendicular line drawn from the point of incidence to the plane of reflecting surface is called <b>normal</b> .
Angle of incidence	:	The angle between the incident ray and the line BD.
Angle of reflection	:	The angle between the reflected ray and the normal.
Transparent materials	:	Materials that allow light to pass through completely are known as <b>transparent material</b> .
Translucent materials	:	Objects that allow light to pass through partially are called <b>translucent material</b> .
Opaque materials	:	Materials that are not able to allow light to pass through, are called <b>opaque material</b> .
Real image	:	The images that are obtained on a screen are called <b>real image</b> .
Prism	:	A <b>prism</b> is an object made up of a transparent material, like glass or plastic that has at least two flat surfaces that form an acute angle.
Spectrum	:	If the colours are not clear adjust the position of the mirror to bring it into focus. This arrangement of colours in sunlight is called <b>spectrum</b> .



## Evaluation

### I. Choose the correct option:

1. Light travels only in a \_\_\_\_\_. It is because of this property that \_\_\_\_\_ are formed
- (a) curved line, shadows      (b) straight line, shadows  
 (c) straight line, reflection  
 (d) curved line and then straight line, shadows

**Ans (b) straight line, shadows**

2. Light that hits a mirror gets \_\_\_\_\_

- (a) Transmitted      (b) Reflected  
 (c) Absorbed      (d) Refracted

**Ans (b) Reflected**

3. \_\_\_\_\_ surface reflects the light well

- (a) Water      (b) Compact disc  
 (c) Mirror      (d) Stone

**Ans (c) Mirror**



- 4. Light is a form of \_\_\_\_\_**  
 (a) matter (b) energy (c) medium (d) particle **Ans (b) energy**
- 5. You can see your image in polished floors, but not in wooden table because \_\_\_\_\_**  
 (a) regular reflection takes place in wooden table and irregular reflection in polished floor  
 (b) regular reflection takes place in polished floor and irregular reflection in wooden table  
 (c) regular reflection takes place in both polished floor and wooden table  
 (d) irregular reflection takes place in both polished floor and wooden table  
**Ans (b) regular reflection takes place in polished floor and irregular reflection in wooden table**
- 6. Choose the translucent substance from the following**  
 (a) glass (b) wood (c) water (d) Clouds **Ans (d) clouds**
- 7. Reflection occurs, when the light**  
 (a) about to reach a surface (b) approaches a surface  
 (c) passes through a surface (d) None of these **Ans (b) approaches a surface**
- 8. Which of the following is the best reflector of light?**  
 (a) plastic plate (b) plane mirror  
 (c) wall (d) paper **Ans (b) plane mirror**
- 9. Sivarajan placed a meter stick in the playground at 7.00 am in the morning. How will the shadow of the stick at noon look in comparison to the one in the morning**  
 (a) There will be no shadow  
 (b) The shadow will be longer and on the opposite side as the sun  
 (c) The shadow will be shorter and on the same side as the sun  
 (d) The shadow will be shorter **Ans (d) The shadow will be shorter**
- 10. The image formed by a pinhole camera is inverted because,**  
 (a) light travels in straight lines  
 (b) light rays become laterally inverted as they pass through a pinhole camera  
 (c) light rays pass through the pinhole  
 (d) light rays get reflected **Ans (a) light travels in straight lines**
- 11. Which of the following facts explain how shadows are formed?**  
 (a) Light travels in straight lines  
 (b) Opaque bodies do not allow light to pass through them  
 (c) Reflection occurs at a smooth surfaces like mirrors  
 (d) Lateral inversion happens  
 (a) both A and B (b) both A and D  
 (c) both B and C (d) only A **Ans (a) both A and B**



## II. Fill in the blanks:

1. A plane mirror produces a \_\_\_\_\_ image. **Ans** virtual and erect
2. A \_\_\_\_\_ reflection helps us to see the objects. **Ans** regular
3. The light ray gets \_\_\_\_\_ when it falls on any polished surface. **Ans** reflected
4. Sunlight is a blend of \_\_\_\_\_ colours. **Ans** seven
5. The splitting of white light into seven colours is called \_\_\_\_\_. **Ans** dispersion
6. The moon \_\_\_\_\_ sun light. **Ans** reflects
7. The sunlight can be split into its constituent colours using \_\_\_\_\_. **Ans** prism
8. Reflection of light from rough surface is called \_\_\_\_\_ reflection. **Ans** irregular

## III. Say TRUE or FALSE.

1. The image of right hand in a plane mirror looks like a left hand.  
**Ans. True**
2. Rainbow is formed by dispersion of which light by water drops.  
**Ans. True**
3. The image formed by the plane mirror is laterally inverted, hence the image seen through the periscope is also laterally inverted  
**Ans. False. Correct statement :** The image formed by the plane mirror is laterally inverted, hence the image seen through the periscope is **Virtual**.  
This is because in periscope, image is reflected by two mirrors.
4. We see planets because they reflect light from the sun  
**Ans. True**
5. We see a book because it reflects the light that falls on its surface  
**Ans. True**
6. The image formed in a pinhole camera is always inverted  
**Ans. True**
7. The image formed in a pinhole camera is always the same size as the object  
**Ans. False.**
8. The image formed in a plane mirror is upside down  
**Ans. False. Correct statement :** The image formed in a plane mirror is **erect**.
9. A plane mirror is opaque  
**Ans. True**
10. A shadow is formed on the same side of the object as the source of light.  
**Ans. False. Correct statement :** A shadow is formed on the **opposite** side of the object as the source of light.



**11. We are able to see things around us with the help of regular reflection**

**Ans. True**

**12. After passing through a prism, white light splits into a band of seven colours**

**Ans. True**

**IV. Match the following:**

1.	Rectilinear propagation	Primary source of light
2.	Plane Mirror	Non-luminous object
3.	Fire fly	Periscope
4.	The Moon	Pinhole camera
5.	Wide light source	Spectrum of light
6.	Regular reflection	luminous object
7.	The sun	Penumbra
8.	Band of seven colors	Glossy surface

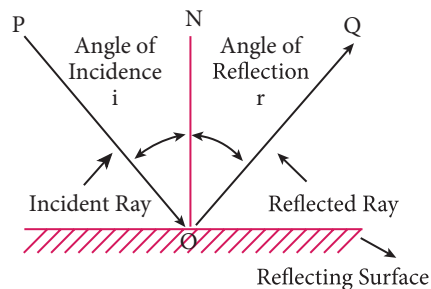
**Ans.**

1.	Rectilinear propagation	Pinhole camera
2.	Plane Mirror	Periscope
3.	Fire fly	Luminous object
4.	The Moon	Non-luminous object
5.	Wide light source	Penumbra
6.	Regular reflection	Glossy surface
7.	The sun	Primary source of light
8.	Band of seven colors	Spectrum of light

**V. Answer the following questions in short:**

**1. With the help of a diagram, state the laws of reflection.**

**Ans. Laws of reflection:**

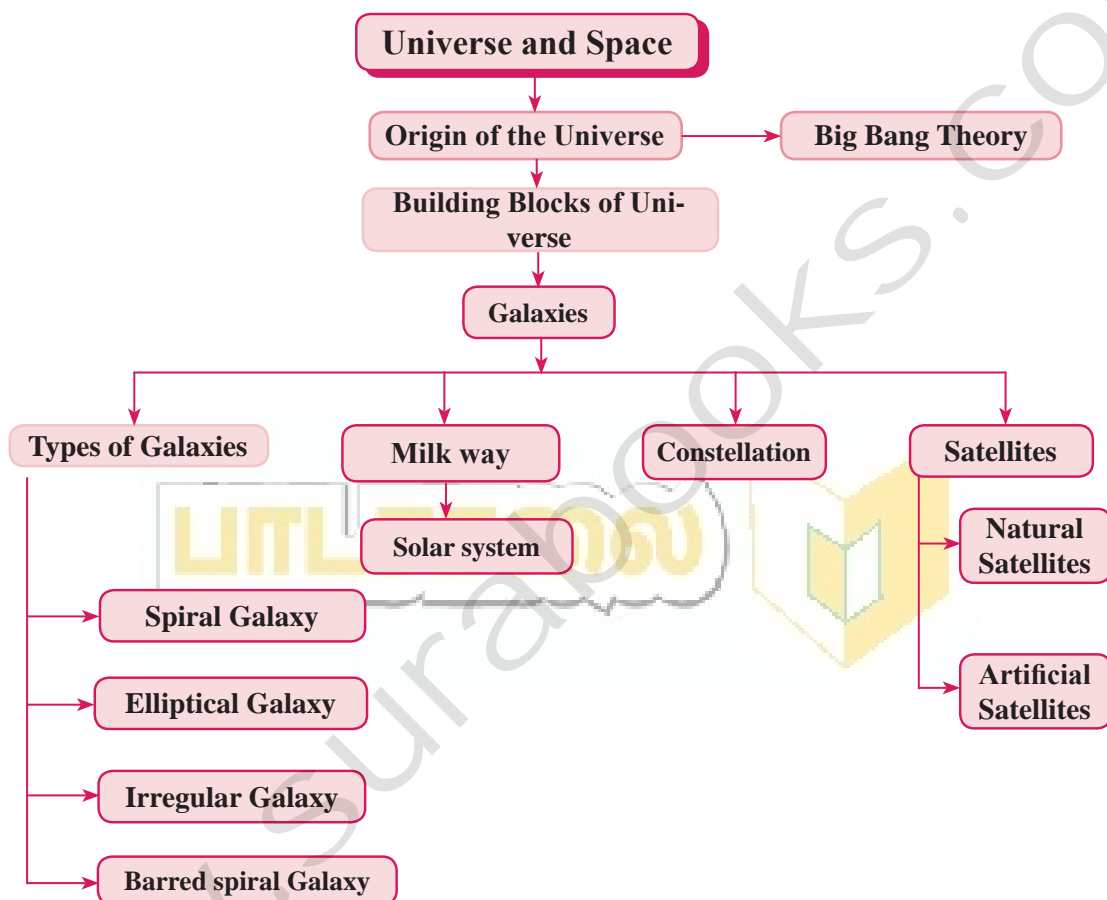


- (i) The angle of incidence is always equal to the angle of reflection  $i = r$
- (ii) The incident ray, the reflected ray and the normal at the point of incidence lie on the same plane.

## Unit 2

# UNIVERSE AND SPACE

### CONCEPT MAP



### Must Know Definitions

Astronomy	:	The field of study of the universe is called <b>astronomy</b> .
Retrograde motion	:	The reversal of direction of planets is called as ' <b>retrograde motion</b> '.
Galaxy	:	A <b>Galaxy</b> is a large collection of stars or cluster of stars and celestial bodies held together by gravitational attraction.
Constellation	:	A <b>constellation</b> is a recognizable pattern of stars in the night sky when viewed from the Earth.



Satellite	:	An object that revolves around a planet in a stable and consistent orbit is called a <b>satellite</b> .
Star	:	A <b>Star</b> is a luminous heavenly body that radiate energy.
Natural satellites	:	All natural objects revolving around a planet are natural satellites.
Artificial satellites	:	Artificial satellites are man-made objects placed in an orbit to rotate around a planet – usually the Earth.
Elliptical Galaxy	:	An elliptical Galaxy is a type of Galaxy having an approximately ellipsoidal shape and a smooth image.
Barred spiral Galaxy	:	A barred spiral Galaxy is a spiral Galaxy with a central bar-shaped structure composed of Stars.



## Evaluation

### I. Choose the correct answers:

- The Moon takes \_\_\_\_\_ days to complete one revolution around the Earth.  
 (a) 25 (b) 26 (c) 27 (d) 28 **Ans (c) 27**
- If the Moon is appearing in the sky today near the star Karthikai, the position of the Moon after 27 days is near the Star  
 (a) Bharani (b) Karthikai (c) Rohini (d) Asvini **Ans (d) Asvini**
- Telescope was invented by  
 (a) Han Lippershey (b) Galilio  
 (c) Nicolus Copernicus (d) Ptolomy **Ans (a) Han Lippershey**
- The galaxy containing young and hot stars is  
 (a) elliptical galaxy (b) irregular galaxy  
 (c) cluster (d) spiral galaxy **Ans (d) spiral galaxy**
- With the launch of this satellite, ISRO became capable of launching 4 ton heavy satellites  
 (a) GSAT- 13 (b) GSAT- 14  
 (c) GSAT- 17 (d) Way par GSAT- 19 **Ans (d) Way par GSAT-19**

### II. Fill in the blanks:

- Waxing of Moon means \_\_\_\_\_. **Ans growing or expanding**
- Heliocentric model is proposed by \_\_\_\_\_. **Ans Nicolus copernicus**
- \_\_\_\_\_ is the prevailing model of Evolution of the Universe. **Ans The Big Bang Theory**



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4. \_\_\_\_\_ is a large constellation which covers a large part of the sky.

**Ans Ursa Major**

5. \_\_\_\_\_ is the first satellite launched by India

**Ans Aryabhata**

### III. True or False – If False give the correct answer

1. On a full Moon day, when the Sun is setting in the west, Moon rises in the West.

**Ans. False.** Correct statement : On a full Moon day, when the Sun is setting in the west, Moon rises in the **East**.

2. The word crescent refers to the phases where the Moon is less than half illuminated.

**Ans. True.**

3. Galilio accepted the Geo-centric model.

**Ans. False.** Correct statement : Galilio **did not** accepted the Geo-centric model.

4. Our Milky Way galaxy is identified as an elliptical galaxy.

**Ans. False.** Correct statement : Our Milky Way galaxy is identified as an **spiral** galaxy.

5. The planet Venus in our solar system doesn't have a Moon.

**Ans. True**

### IV. Match the following:

1.	Rohini	GSLV-Mark III
2.	GSAT-14	GSLV Mark III D1
3.	GSAT-19	SLV-3
4.	Chandrayaan-2	PSLV-XL C25
5.	Mangalyaan	GSLV-D5

**Ans.**

1.	Rohini	SLV-3
2.	GSAT-14	GSLV-D5
3.	GSAT-19	GSLV Mark III D1
4.	Chandrayaan-2	GSLV-Mark III
5.	Mangalyaan	PSLV-XL C25

### V. Analogy:

1. Older stars : elliptical galaxies :: younger stars : \_\_\_\_\_. **Ans Irregular galaxies.**

2. Nearest galaxy : Andromeda :: Nearest star : \_\_\_\_\_. **Ans Alpha Centauri.**

### VI. Very short answer:

1. The word \_\_\_\_\_ refers to the phases where the Moon is less than half illuminated (crescent / gibbous)

**Ans.** crescent.



**2. \_\_\_\_\_ and \_\_\_\_\_ planets never appear in the mid-night sky.**

**Ans.** Mercury, Venus.

**3. Number of days taken by the Mars to orbit around the Sun.**

**Ans.** 687 days.

**4. In which phase does the size of the planet Venus is small?**

**Ans.** When it was in Gibbous phase.

**5. The only evidence of the big bang theory is**

**Ans.** The only evidence of the big bang theory is a faint glow in space, called cosmic microwave background.

**6. The galaxy which contains abundant amount of gas and dust is \_\_\_\_\_?**

**Ans.** Spiral galaxy.

**7. Which country launched the world's first artificial launch vehicle?**

**Ans.** Russia launched the world's first artificial launch vehicle.

### **VII. Short Answer Questions:**

**1. What is epicyclic model?**

- Ans.**
- (i) To explain the puzzling phenomena astronomers in early times proposed a change in the simple geocentric model. This is called as epicycle model.
  - (ii) A small circle whose centre is on the circumference of a larger circle, in ptolemic astronomy.
  - (iii) It was seen as the basis of revolution of the seven planets, given a fixed central Earth.

**2. Name the four different types of Galaxies.**

- Ans.**
- (i) Spiral galaxy.
  - (ii) Elliptical galaxy
  - (iii) Irregular galaxy
  - (iv) Barred spiral galaxy

**3. What is constellation?**

**Ans.** A constellation is a recognizable pattern of stars in the night sky when viewed from the Earth.

**4. Give the expansions of PSLV and GSLV.**

**Ans. PSLV :** Polar Satellite Launch Vehicle.

**GSLV :** Geosynchronous Satellite Launch Vehicle.

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**SCIENCE**

Time Allowed : 2.00 Hours]

(with answers)

Reg. No.

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[ Max. Marks : 60

**PART - A**

**I. Choose the correct answer :  
 $10 \times 1 = 10$**

1. Light is a form of \_\_\_\_\_  
 (a) Matter (b) energy  
 (c) Medium (d) Particle
2. Which of the following is the best reflector of light?  
 (a) Plastic plate (b) Plane Mirror  
 (c) Wall (d) Paper
3. The galaxy containing young and hot star is \_\_\_\_\_  
 (a) elliptical galaxy  
 (b) irregular galaxy  
 (c) cluster  
 (d) Spiral galaxy
4. The first man - made fibre is \_\_\_\_\_  
 (a) Nylon (b) Rayon  
 (c) Polyester (d) Cotton
5. A synthetic fibre which has similar properties to wool is \_\_\_\_\_  
 (a) Nylon (b) Polyester  
 (c) Acrylic (d) PVC
6. Which is the hottest part in the flame of candle \_\_\_\_\_  
 (a) Blue (b) yellow  
 (c) Black (d) Way part
7. \_\_\_\_\_ are the neutralize stomach acid  
 (a) Antacid (b) Antipyretic  
 (c) Analgesic (d) Anti - histanic

8. Eggs are rich in \_\_\_\_\_  
 (a) Protein (b) Carbohydrate  
 (c) fat (d) Acid
9. Light that hits a mirror get  
 (a) Transmitted (b) Reflected  
 (c) Absorbed (d) Refracted
10. Which parts of the goat and sheep is used for manufacturing clothes  
 (a) Leg (b) hand  
 (c) hair (d) head

**PART - B**

**Answer the following any 15.  $15 \times 1 = 30$**

11. What are the luminous objects?
12. What are the parts of Shadow?
13. Is the moon a luminous object?
14. Name the four different types of galaxies?
15. **State True or False**  
 a) The image formed in a pinhole camera is always inverted.  
 b) Oxygen is necessary for combustion.
16. What is the 5 R Principle?
17. It is not advisable to burn plastic and synthetic fabrics. Why?
18. What is polymer chemistry?
19. **Fill in the blanks :**  
 a) \_\_\_\_\_ is the first Satellite launched by India.  
 b) \_\_\_\_\_ is the Strongest natural fibre.
20. What is oral rehydration solution?
21. What is ignition temperature?

**22. Match the following :**

- |                            |   |                         |
|----------------------------|---|-------------------------|
| a) Rectilinear propagation | - | Primary source of light |
| b) Fire fly                | - | Non - luminous object   |
| c) The moon                | - | Luminous object         |
| d) The Sun                 | - | Pin hole Camera         |

23. What is shearing?

24. State the laws of reflection.

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25. **Analogy :**

- a) **Glass : Transparent :** \_\_\_\_\_  
Opaque material.
- b) **Older stars : Elliptical galaxies :** \_\_\_\_\_  
Younger stars :

26. Name the unit in which the calorific value of a fuel is expressed?

27. What is satellite?

28. **Match the following :**

- |    |         |   |           |
|----|---------|---|-----------|
| a) | Cocoons | - | Calcium   |
| b) | Broiler | - | Silk worm |
| c) | Goat    | - | Poultry   |
| d) | Milk    | - | Meat      |

29. What are the two types of fibres that are obtained from animals?

30. What gives plastic different qualities and characteristics?

### PART - C

**III Answer any one question from each section : [Draw a Diagram if Necessary]**  
**4 × 5 = 20**

#### Section - 1

31. Differentiate between a reflection and a shadow : (OR)

32. What are the difference between luminous and non - luminous objects. Give two examples of each.

#### Section - 2

33. List the advantages and disadvantages of synthetic fibres. (OR)

34. Suggest the methods of disposing plastics.

#### Section - 3

35. What are the major steps involved in this wool factory. (OR)

36. Write the uses of the wool.

#### Section - 4

37. What are the Characteristics of good fuel. (OR)

38. Make labelled diagram of candle flame.

### Answers

#### PART - A

I.

1. (b) energy
2. (b) Plane Mirror
3. (d) Spiral galaxy
4. (b) Rayon
5. (c) Acrylic
6. (a) Blue

7. (a) Antacid
8. (a) Protein
9. (b) Reflected
10. (c) hair

### PART - B

11. All objects which emit light energy by themselves are called luminous objects.  
Ex. : Sun, electric bulb.

12. i) Umbra ii) Penumbra

13. No, the moon is non-luminous. The reason is that moon does not produce its own light. Instead, it reflects the light of the sun falling on it.

14. i) Spiral galaxy.
- ii) Elliptical galaxy
- iii) Irregular galaxy
- iv) Barred spiral galaxy

15. a) True b) True

16. Plastic disposal is the 5 R principle, Refuse, Reduce, Reuse, Recycle and Recover is called as 5 R principle.

17. Burning of plastics and synthetic fabrics is not a good solution, as we end up wasting non-renewable resources and produce super toxic chemicals that are difficult to store or dispose safely.

18. Polymer chemistry has a positive impact on your everyday life. Many of the materials you use are linked to polymer chemistry.

19. a) Aryabhatta b) Cotton

20. ORS (Oral Rehydration Solution) is a special combination of dry salts that is mixed with safe water. It can help to replace the fluids lost due to diarrhea.

21. The minimum temperature at which a substance catches fire and burns is called its ignition temperature.

22. a) Rectilinear - Pin hole Camera propagation
- b) Fire fly - Luminous object
- c) The moon - Non - luminous object
- d) The Sun - Primary source of light

23. The fleece of the sheep is removed from its body. This is called shearing.

24. i) The angle of incidence is always equal to the angle of reflection.  $\angle i = \angle r$
- ii) The incident ray, the reflected ray and the normal at the point of incidence lie on the same plane.