

Loyola

EC SCIENCE



TERM - I
TERM - II
TERM - III

6

BASED ON CCE

This special guide is prepared
 on the basis of New syllabus

Loyola**Publications**

Vivek Illam, No. 19, Raj Nagar, N.G.O. 'A' Colony,
 Palayamkottai, Tirunelveli - 627 007.

Ph: 0462 - 2553186, 2552405

Cell : 94433 81701, 94422 69810, 90474 74696
 81110 94696, 89400 02320, 89400 02321

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6th EC SCIENCE - முதன்மை புத்தகம்

மாணவ / மாணவிகளின் உள, மனம் நலன்கருதி தயாரிக்கப்பட்ட சிறப்பு நூல்

I. சிறப்புகள்

1. விடைகள் மிக எளிமையாகவும் மாணவ / மாணவிகள் எளிதில் புரியும் வண்ணம் 10, 11 மற்றும் 12ம் வகுப்பு அரசுத்தேர்வில் விடைத்தாள் மதிப்பீடு செய்வது போல் [Key] அடிப்படையில் தயாரிக்கப்பட்டுள்ளது.
2. 2 மற்றும் 5 மதிப்பெண் விடைகள் மாணவ / மாணவிகள் புரிந்து கொள்வதற்காக சற்று விரிவாக கொடுக்கப்பட்டுள்ளது.
3. தேவைக்கேற்ப கூடுதல் வினாவிடைகள் கொடுக்கப்பட்டுள்ளது.
4. மூன்று பருவமாக பிரிக்கப்பட்டுள்ளது.
5. பாடத்திற்கு பின்னால் உள்ள செயல்பாடுகளுக்கான [Fa(a)] விடை கொடுக்கப்பட்டுள்ளது.
6. 6ம் வகுப்பு முதல் 9ம் வகுப்பு வரையுள்ள அனைத்து நூல்களும் 10, 11 மற்றும் 12ம் வகுப்பை நோக்கியே எழுதப்பட்டுள்ளது.

II. உருவாக்க மதிப்பீட்டு - பதிவேடு [Fa(b)]

1. வளரறி மதிப்பீட்டிற்காக ஒவ்வொரு பருவத்திற்கும் நான்கு வினாத்தாள் இப்பதிவேட்டில் இடம் பெற்றுள்ளது.

குறிப்பு : Loyola EC புத்தகங்களை 10,11 மற்றும் 12ம் வகுப்புகளில் மாணவ / மாணவிகள் வாங்கிப் பயின்றால், அரசுத்தேர்வில் அதிக மதிப்பெண்கள் பெற்று உச்சத்தைத் தொடலாம் என்பதை மகிழ்ச்சியுடன் தெரிவித்துக்கொள்கிறோம்.

வாழ்த்துக்கள்

அன்புடன்

LOYOLA PUBLICATIONS

Authors

Mr. A.S.Anthony Samy

Mrs. Vijayarani

Mr. A.Santhiyagu Saleth

Mrs. Helan



ஆசிரியர்கள் மற்றும் மாணவர்கள் இந்த QR Code ஸ்கேன் செய்து உங்களது தொலைபேசி எண்ணை பதிவு செய்து கொள்ளவும். இதன் மூலம் பாடம் சம்பந்தப்பட்ட குறுஞ்செய்திகள், whatsapp மற்றும் SMS மூலமாக அனுப்பப்படும். இதனைப் பயன்படுத்திக் கொள்ளவும்.

லொயோலா பப்ளிக்கேஷனின் – நோக்கம்

நோக்கம் :

படிப்பில் மின்தங்கிய மாணவர்கள் / மாணவிகளை உயர்ந்த நிலைக்குக் கொண்டு வருதல் (6ஆம் வகுப்பு முதல் 12ஆம் வகுப்பு வரை).

நோக்கத்தை அடைய யுக்திகள் :

1. மாணவ / மாணவிகளின் உளவியல் அடிப்படையில் எளிதில் புரிய வைத்தல்.
 2. மாணவ / மாணவிகள் அச்சமின்றி அரசுத் தேர்வுகளை எதிர் கொள்ள உதவுதல்.
 3. அரசுத் தேர்வுகளில் விடைத்தாள்களை மதிப்பீடு செய்யும் விடைக்குறிப்பு (Key) அடிப்படையில் தயாரிப்பு.
 4. ஒவ்வொரு கேள்விக்குரிய பதில்கள் சுருக்கமாகவும், தெளிவாகவும் இருத்தல்.
 5. மெல்லக்கற்கும் மாணவ / மாணவிகளுக்கு மேலும் எளிமைப்படுத்திக் கொடுத்தல்.
- (தமிழ் மற்றும் ஆங்கில வழிக் கல்வியில்
10ஆம் வகுப்பு – தமிழ், ஆங்கிலம், அறிவியல், சமூகஅறிவியல்)
11ஆம் வகுப்பு – தமிழ் மற்றும் ஆங்கிலம்
12ஆம் வகுப்பு – தமிழ் மற்றும் ஆங்கிலம்

சிறப்புகள் :

1. அரசுத் தேர்வில் கேட்கப்படும் புத்தக வினாக்களைத் தவிர சலுகைத் வினாக்கள் நமது பதிப்புகளில் இடம் பெற்றுள்ளன.
2. லொயோலா ஈசி நூல்களை வாங்கிப் பயன்படுத்தும் மாணவ / மாணவிகள் ...
 - ❖ அரசுத் தேர்வில் தேர்ச்சியடையவே முடியாது என்ற நிலையில் உள்ளவர்கள் மிக எளிதில் 35% மதிப்பெண்கள் பெற்று தேர்ச்சி பெறலாம்.
 - ❖ 35% - 40% மதிப்பெண்கள் பெறும் மாணவ / மாணவிகள் 75% - 80% மதிப்பெண்கள் வரை பெறலாம்.
 - ❖ 80% மதிப்பெண்கள் பெறும் மாணவ / மாணவிகள் 95% - 99% மதிப்பெண்கள் வரை பெறலாம்.
 - ❖ 10, 11 மற்றும் 12ஆம் வகுப்பு அரசுத்தேர்வுகளில் கேட்கப்படும் வினாத்தாள்களில் 98% வினாக்களும் மற்றும் பல ஆண்டுகளில் 100% வினாக்களும் இடம்பெற்று வருகின்றன என்பது லொயோலா பதிப்புகளின் சிறப்பு.

வழிகாட்டுதல் :

உயர் படிப்பிற்கு மாணவ / மாணவிகளின் எதிர்கால நலனைக் கருத்தில் கொண்டு அவர்களுக்கு வழிகாட்டும் நோக்கில் 10, 12ஆம் வகுப்பு தேர்ச்சிக்குப் பின் என்ன படிக்கலாம்? என்பதைப் பற்றிய ஆலோசனைகள் இடம் பெற்றுள்ளன.

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TERM - I

UNIT

1

MEASUREMENTS

PART I - BOOK BACK QUESTIONS

I. Choose the correct answer:

- The height of a tree can be measured by
a) metre scale b) metre rod c) plastic ruler d) measuring tape.
Ans: d) measuring tape.
- Conversion of 7 m into cm gives _____
a) 70 cm b) 7 cm c) 700 cm d) 7000 cm **Ans: c) 700 cm**
- Quantity that can be measured is called ____
a) physical quantity b) measurement c) unit d) motion.
Ans: b) measurement
- Choose the correct one
a) $\text{km} > \text{mm} > \text{cm} > \text{m}$ b) $\text{km} > \text{mm} > \text{m} > \text{cm}$
c) $\text{km} > \text{m} > \text{cm} > \text{mm}$ d) $\text{km} > \text{cm} > \text{m} > \text{mm}$ **Ans: c) $\text{km} > \text{m} > \text{cm} > \text{mm}$**
- While measuring the length of an object using a ruler, the position of your eye should be
a) Left side of the point.
b) Vertically above the point where the measurement is to be taken.
c) Right side of the point.
d) any where according to one's convenience.
Ans. b) Vertically above the point where the measurement is to be taken.

II. Fill in the blanks:

- SI unit of length is _____. **Ans: metre**
- 500 gm = _____ kilogram. **Ans: 0.5**
- The distance between Delhi and Chennai can be measured in _____. **Ans: Kilometre**
- 1 m = _____ cm. **Ans: 100**
- 5 km = _____ m. **Ans: 5000**

III. State True or false. If false, correct the statement

- We can say that mass of an object is 126kg **Ans: True**
- Length of one's chest can be measured using metre scale. **Ans: False**
Length of one's chest can be measured using **measuring tape.**
- Ten millimetre makes one centimetre. **Ans: True**

4. A hand span is a reliable measure of length. **Ans: False**
metre is a reliable measure of length.
5. The SI system of units is accepted everywhere in the world. **Ans: True**

IV. Complete the Analogy

1. Sugar : Beam Balance :: Lime Juice : _____? **Ans: Measuring Jar**
2. Height of a person : cm :: Length of your sharpened pencil lead : ____? **Ans: mm**
3. Milk : Volume :: vegetables : _____? **Ans: Weight (Kilogram)**

V. Match the following

	Column A		Column B		Answer
1	Length of the fore arm	a	metre	e	Cubit
2	SI unit of length	b	Second	a	metre
3	Nano	c	10^3	d	10^{-9}
4	SI unit of time	d	10^{-9}	b	Second
5	Kilo	e	Cubit	c	10^3

VI. Arrange the following in the increasing order of unit

1 Metre, 1 Centimetre, 1 Kilometre, and 1 Millimetre.

Ans. 1 Millimetre, 1 Centimetre, 1 Metre, 1 Kilometre.

VII. Answer in a word or two.

- | | |
|---|------------------------------|
| 1. What is the full form of SI system? | International system of unit |
| 2. Name any one instrument used for measuring mass. | Beam Balance |
| 3. Find the odd one out: Kilogram, millimetre, centimetre, nanometre. | Kilogram |
| 4. What is the SI unit of mass? | Kilogram |
| 5. What are the two parts present in a measurement. | i) a number, ii) unit |

VIII. Find the answer for the following questions within the grid

	Answer
1. 10^{-3} is one _____.	millimetre
2. SI unit of time is _____.	Second
3. Cross view of reading a measurement leads to _____.	Error
4. _____ is the one what a clock reads.	Time
5. _____ is the amount of substance present in an object.	mass
6. _____ can be taken to get the final reading of the recordings of different students for a single measurement.	Average
7. _____ is a fundamental quantity.	Length



8. _____ shows the distance covered by an automobile.
 9. A tailor uses _____ to take measurements to stitch the cloth.
 10. Liquids are measured with this physical quantity _____.

Odometer
 tape
 litres

A		P		L							R		K
C		O		E							O		S
M		K		N							R		I
P		R		G							R		T
R	H	E	S	T	E	D	L	L	I	T	R	E	D
L		T		H							H		P
O		E		O					N		K		E
A		M	A	S	S				O		R		V
V		I		E					C		T		O
E		L		K					E		S		S
R		L		I					S		K		H
A		I		T					I		V		P
G		M		X					M		N		U
E		Z		D					E	S	K	P	G
Z	T	D		H					O	D	O	M	E

IX. Answer briefly:

1. Define measurement.

The comparison of unknown quantities with some known quantities is known as measurement.

2. Define mass?

Mass is the measure of the amount of matter in an object.

3. The distance between two places is 43.65 km. convert it into metre and cm.

(a) Convert km into metre

$$1 \text{ km} = 1000 \text{ m}$$

$$\therefore 43.65 \text{ km} = 43.65 \times 1000 = 43650.00 = 43650 \\ = 43650 \text{ m}$$

(b) Convert km into cm.

$$1 \text{ km} = 1000 \text{ m}$$

$$1 \text{ m} = 100 \text{ cm}$$

$$\begin{aligned}
 1 \text{ km} &= 1000 \times 100 \text{ cm} \\
 1 \text{ km} &= 100000 \text{ cm} \\
 \therefore 43.65 \text{ km} &= 43.65 \times 100000 = 4365000.00 \\
 &= 4365000 \text{ cm}
 \end{aligned}$$

4. What are the rules to be followed to make accurate measurement with scale?

- (i) Take care to write the correct submultiple.
- (ii) Always keep the object in parallel to the scale.
- (iii) Start the measurement from '0' of the scale.

X. Solve the following:

1. The distance between your school and your house is 2250 m. Express this distance in kilometre.

Distance between school and house is 2250 m.

$$1000\text{m} = 1\text{km}$$

$$\therefore 2250 \text{ m} = 2250 \div 1000 = 2.25 \text{ km}$$

2. While measuring the length of a sharpened pencil, reading of the scale at one end is 2.0 cm and at the other end is 12.1 cm. What is the length of the pencil?

Sharpened pencil Reading at one end = 2.0 cm

Sharpened pencil Reading at the other end = 12.1 cm

$$\begin{aligned}
 \text{Length of the pencil} &= \text{Difference between two ends.} \\
 &= 12.1 \text{ cm} - 2.0 \text{ cm} \\
 &= 10.1 \text{ cm}
 \end{aligned}$$

XI. Answer in detail:

1. Explain two methods that you can use to measure the length of a curved line.

Method: 1 - Using a string

- Take a string and place it along the curved line.
- Mark the points where the curved line begins and ends on the string.
- Stretch the string along the length of a meter scale and measure the distance between the two markings of the string.
- This will give you the length of a curved line.



Method: 2 - Using a divider

- Take a divider separate the legs of the divider by 0.5 cm (or) 1 cm using a ruler.
- Place it on the curved line starting from one end.
- Mark the position of the other end.
- Move it along the line again and again cutting the line into number and segments of equal lengths.

- The remaining parts of the line can be measured using a scale.
- The Length of the line = (number of segments x length of each segment) + Length of the left over part.

2. Fill in the following chart.

Property	Definition	Basic unit	Instrument used for Measuring.
Length	The distance between one end and the other desired end.	Metre (m)	Metre scale measuring tape.
Mass	Mass is the measure of the amount of matter in an object.	Kilogram (kg)	Beam balance, Electronic balance.
Volume	The amount of space that an object occupies (or) that is enclosed with in a container.	Cubic metre (m ³) Litres	Graduated cylinder, beaker, pipettes, and burette.
Time	Interval between two events.	seconds	Sand clock, electronic clock, stop watches.

PART II - ADDITIONAL QUESTIONS

I. Choose the best option:

1. What is 7 m in mm?
a) 0.7 mm b) 700 mm c) 7000 mm d) 70 mm **Ans. c) 7000 mm**
2. What is the unit of electric current in SI system?
a) Kelvin b) Ampere c) seconds d) Volt. **Ans. b) Ampere**
3. What is the unit
a) metre b) litre c) second d) kilogram. **Ans. a) metre**
4. These are the measurements used in measuring the volume of liquid.
a) cylinder b) pipettes c) burettes d) All. **Ans. d) All**
5. These are the instruments used in measuring the volume of the objects with irregular shape.
a) Balance b) Electronic balance
c) Displacement of water method d) sand clock.
Ans. c) Displacement of water method.

II. True or false:

1. The comparison of known quantity with the unknown quantity is the mass.
2. The area can be calculated by using the two lengths and width.
3. Using electronic balance weight can be measured accurately.

Ans. 1. False, 2. True, 3. False.

III. Fill in the Blanks.**Answer**

- | | |
|---|-------------|
| 1. 78.75 cm = ____ m ____ cm | 78 m, 75 cm |
| 2. 1195 m = ____ km ____ m | 1 km, 195 m |
| 3. 15 cm 10 mm = ____ mm | 160 mm |
| 4. 45 km 33 m = ____ m. | 45033 m |
| 5. The metric system of unit is developed in the year ____ by French. | 1790 |

IV. Match

1.	Column A		Column B	Answers
1	Length	a	Litre	d metre.
2	Mass	b	Seconds	c Kilogram
3	Time	c	Kilogram	b Seconds
4	Volume of liquid	d	metre.	a Litre

2.	Column A		Column B	Answers
1	1000 gm	a	1 kilo meter	d 1 kilogram
2	1000 milligram	b	1 ton	c 1 gram
3	1000 kilogram	c	1 gram	b 1 ton
4	1000 kilometre		1 kilogram	

nit in ascending order.

1. Ton - gram - kilogram - Metric ton

Ans. Gram - kilogram - ton - metric ton.

VI. Very short answer. (2 marks.)

1. What is international system of units or SI units?

For the sake of uniformity all over the world we have adopted a common set of units to express measurements that are called as International system of units or SI units.



2. Differentiate mass from weight:

Mass	Weight
Mass is the measure of the amount of matter in an object. Unit – kilogram	Weight is the gravitational pull experienced by the mass. Unit – Newton.

3. What are the unit of measurements of very small length?

(i) Millimetre (ii) centimetre.

4. What are the basic quantity of physics?

(i) Length (ii) Mass (iii) Time.

5. What are the clock used by ancient people to measure day time?

(i) sand clock (ii) sun clock.

6. What are the clock used to measure the time accurately ?

(i) Electronic clock (ii) Stop clock

7. What is odometer?

It is a device used for indicating distance travelled by an automobile.

VII. Give detailed answers: (5 marks)

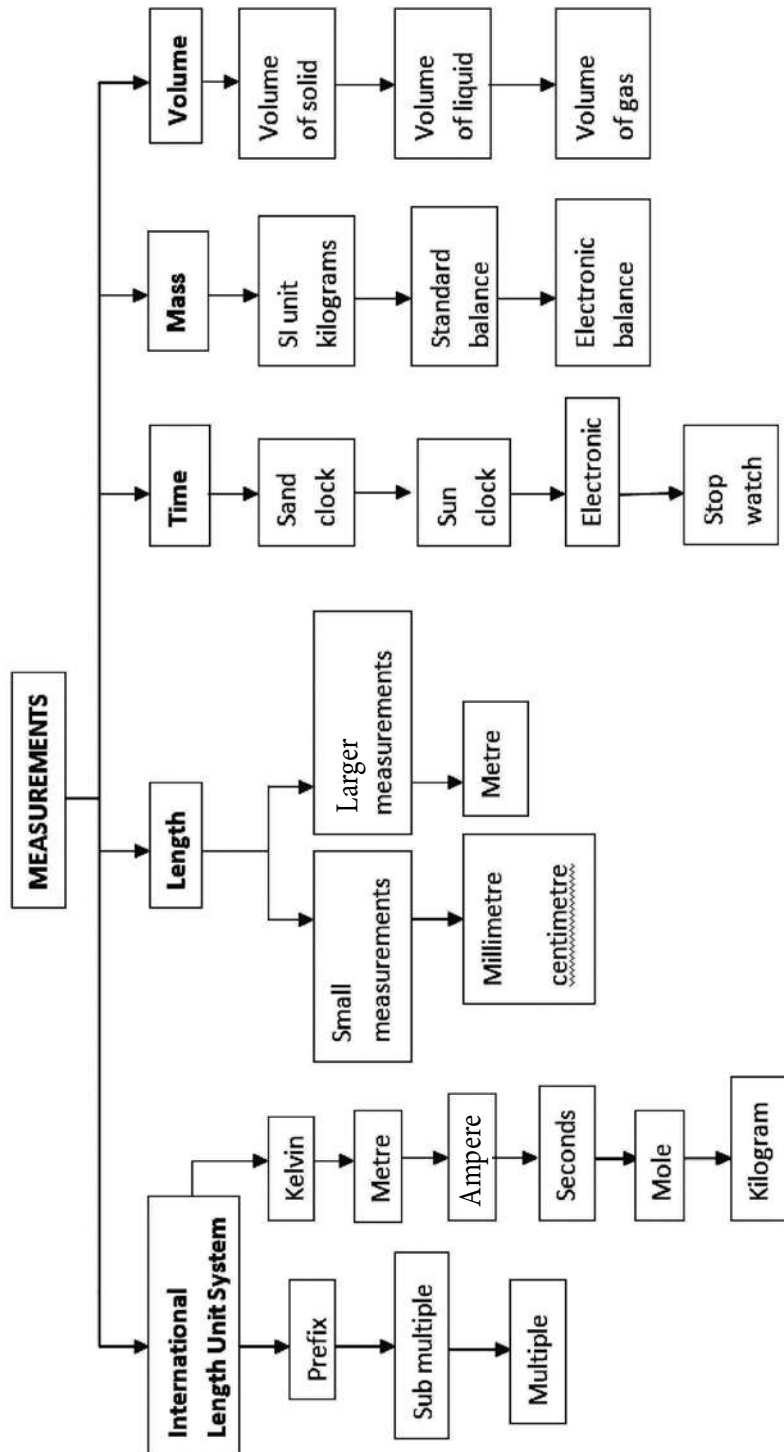
1. What are the features that we must give importance in measuring ?

- The object should match with the '0' of the scale.
- The object should be in parallel with the scale.
- Always start from '0'.
- Measure the bigger division (m) first and then measure smaller (mm) division.
- When we measure the bigger division it should be measured initially and then mark a point and then measure the smaller division (eg) if the length of the pencil is 6 cm 2 mm and then it is 6.2 cm.

2. How will you measure the weight of the object with irregular shape?

- Fill a graduated measuring cylinder with 50 ml of water.
- Tie the stone with a piece of fine thread and immerse the stone completely into water.
- As the stone is immersed the water level will increase. And show 75 ml of rise. The stone displaces water and hence the rise. The amount of water displaced will be the volume of the stone.

Mind Map



UNIT

2

FORCE AND MOTION

PART I - BOOK BACK QUESTIONS

I. Choose the correct answer:

- Unit of speed is
a. m b. s c. kg d. m/s
Ans: d. m/s
- Which among the following is an Oscillatory motion?
a. Rotation of the earth about its axis
b. Revolution of the moon about the earth
c. To and fro movement of a vibrating string
d. All of these.
Ans: c. To and fro movement of a vibrating string
- The correct relation among the following is
a. Speed = Distance x Time b. Speed = Distance / Time.
c. Speed = Time / Distance d. Speed = 1 / (Distance x Time)
Ans: b. Speed = Distance / Time
- Gita travels with her father in a bike to her uncle's house which is 40 km away from her home. She takes 40 minutes to reach there.
Statement 1: She travels at a speed of 1km / minute
Statement 2: She travels at a speed of 1km / hour
a. Statement 1 alone is correct.
b. Statement 2 alone is correct
c. Both statements are correct.
d. Neither statement 1 nor statement 2 is correct. **Ans: a. Statement 1 alone is correct.**

II. Fill in the blanks

- A bike moving on a straight line road is an example for ____ motion. **Ans: Linear**
- Gravitational force is a _____ force. **Ans: non contact**
- Motion of a potter's wheel is an example for _____ motion. **Ans: rotatory**
- When an object covers equal distances in equal interval of time, it is said to be in _____ motion. **Ans: Uniform**

III. State True or False. – if false, Correct the Statements

- To and fro motion is called oscillatory motion. **Ans: True**
- Vibratory motion and rotatory motion are periodic motions. **Ans: False**
Vibratory motion and **Oscillatory motion** are periodic motions.

3. Vehicles moving with varying speeds are said to be in non uniform motion.

Ans: False

Vehicles moving with varying speeds are said to be in **non uniform motions**.

4. Robots will replace human in future.

Ans: False,

Robots **will not replace** human in future.

IV. Match the following:

	A		B		Answer
1		a	Circular motion	c	Linear motion
2		b	Oscillatory motion	d	Rotatory motion
3		c	Linear motion	b	Oscillatory motion
4		d	Rotatory motion	a	Circular motion
5		e	Linear and rotatory motion	e	Linear and rotatory motion

V. Given below is the distance – travelled by an elephant across a forest with uniform

speed. Complete the table below.

Distance (m)	0	4		12		20
Time (s)	0	2	4		8	10

Ans:

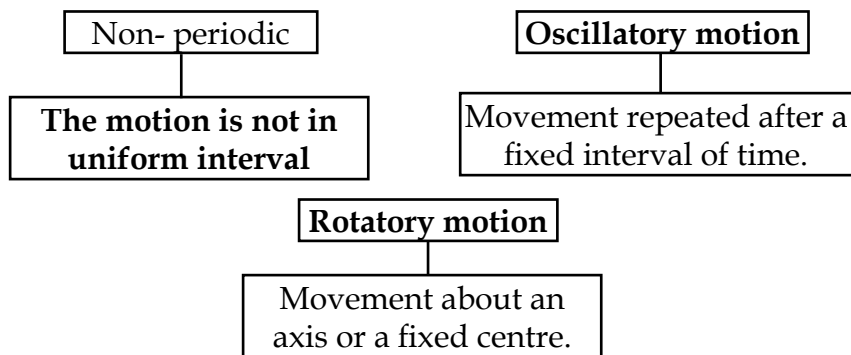
Distance (m)	0	4	8	12	16	20
Time (s)	0	2	4	6	8	10

- (i) Distance/Time = $\frac{4}{2} \times 4 = \frac{16}{2} = 8$
- (ii) Distance/Time = $\frac{4}{2} \times 8 = \frac{32}{2} = 16$
- (iii) Time/Distance = $\frac{10}{20} \times 12 = \frac{12}{2} = 6$

VI. Complete the Analogy:

1. Kicking a ball: contact force :: Falling of leaf : non contact forces.
2. Distance : metre :: Speed : m/s
3. circulatory motion : a spinning top :: oscillatory motion : Pendulum.

VII. Complete the web chart.



VIII. Answer in a word or two

1. The force which acts on an object without physical contact non contact forces.
2. A change in the position of an object with time. Motion.
3. The motion which repeats itself after a fixed interval of time. Oscillatory motion.
4. The motion of an object which covers equal distances in equal Intervals of time Uniform motion.
5. A machine capable of carrying out a complex series of actions automatically. Robots.

IX. Answer briefly

1. **Define force:**
Force is a push or pull by an animate or inanimate agency.
2. **Name different types of motion based on the path .**
 1. Linear motion; 2. Curvilinear; 3. Circular motion; 4. Rotatory motion;
 5. Oscillatory motion 6. Irregular motion.

3. If you are sitting in a moving car, will you be at rest or motion with respect your friend sitting next to you?

I will be at rest with respect to my friend sitting to me in a moving car.

4. Rotation of the earth is a periodic motion. Justify

Rotation of the earth is a periodic motion because it takes equal interval of time for all rotations.

5. Differentiate between rotational and curvilinear motion

	Rotational motion	Curvilinear motion
1	The movement of a body about its own axis	Movement of a body along curved path
2	Eg. Rotating tape	Eg. Throwing a ball

X. Answer in detail:

1. What is motion ? classify different types of motion with examples.

Motion is a change in position of an object with respect to time.

Types of motion based on path:

- Linear motion:** moving in a straight line. Ex. a person walking on a straight path.
- Curvilinear motion:** moving ahead by changing direction. Ex. throwing a ball.
- Circular motion:** moving in a circle path. Ex. Swirling stone tied to the rope.
- Rotatory motion:** The movement of a body about its own axis. Ex. Revolution of earth around sun.
- Oscillatory motion:** Coming back to the same position after a fixed time interval. Ex. pendulum.
- Zig zag (irregular):** The motion of a body in different direction. Ex. the motion of a bee.

Motion based on duration:

Periodic motion : motion repeated in equal interval of time. Ex. Revolution of the moon around the earth.

Non periodic motion: motion is not repeated in equal interval Ex. Sailing swing.

Motion based on speed :

Uniform motion : The object covers uniform distance in uniform intervals. Ex. Hour hand of a clock

Non- uniform motion : if an object covers different distances in different interval of times. Ex. Motion of vehicle.



XI. Problems

1. A vehicle covers a distance of 400 km in 5 hour. calculate its speed.

$$\begin{aligned}\text{speed (s)} &= \frac{\text{distance (d)}}{\text{time (t)}} \\ &= \frac{400}{5} = 80 \text{ km per hour.}\end{aligned}$$

XII. Give examples

Linear motion	- A man walking in a straight road
Curvilinear motion	- motion of paper Aeroplane
Self rotatory motion	- Motion of the wheel in a cart
Circular motion	- Motion of moon a round earth.
Oscillatory motion	- Motion of pendulum
Irregular motion	- People walking in a crowded street.

PART II - ADDITIONAL QUESTIONS**I. Choose the best option:**

1. How earth revolves ?

- a) From west to east b) east to west
c) From north to south d) south to west.

Ans. a) From west to east

2. What is the path of the housefly buzzing around the room?

- a) Periodic motion b) Non- Periodic motion
c) circular motion d) None of the above

Ans. b) Non- Periodic motion

3. What is the unit of average speed in SI system?

- a) metre / second
b) metre / second
c) kilometre/ time d) Metre/ Time.

Ans. a) metre / second

4. The cheetah the fastest animal among terrestrial animals run with the average speed of _____

- a) 100 km /hr b) 200 km/hr
c) 112 km/hr d) 10 km /hr.

Ans: c) 112 km/hr

5. The motion of moon which revolves around the earth is _____

- a) Oscillatory motion b) Periodic motion
c) curvilinear d) b and c

Ans. b) Periodic motion

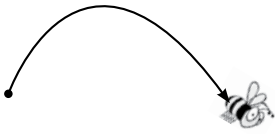
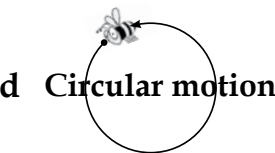
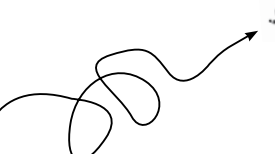
II. Correct Answer: If it is wrong give the correct answer.

1. Change of position of an object with respect to time is motion **Ans: correct.**
2. Swirling stone tied to the rope is an example of **rotatory motion.**
Ans: wrong. Swirling stone tied to the rope is an example of **circular motion.**
3. The children flying in a swing is a periodic motion. **Ans: correct.**
4. All the oscillatory movement are periodic motions. **Ans: correct.**
5. The SI unit of speed is **kilometre** **Ans: wrong,** The SI unit of speed is **metre.**

III. Fill up the blanks :

1. People walking in a crowded street is _____ type of motion. **Ans: irregular**
2. Object moves not in a constant speed then the motion is _____
Ans: on- uniform motion
3. If Priya in her cycle travels 40 km in 2 hours then what is her average speed ?
Ans: 20 km /hr
4. Motion are of _____ types. **Ans: four**
5. The movement of a body about its own axis is _____ **Ans: Rotatory motion**

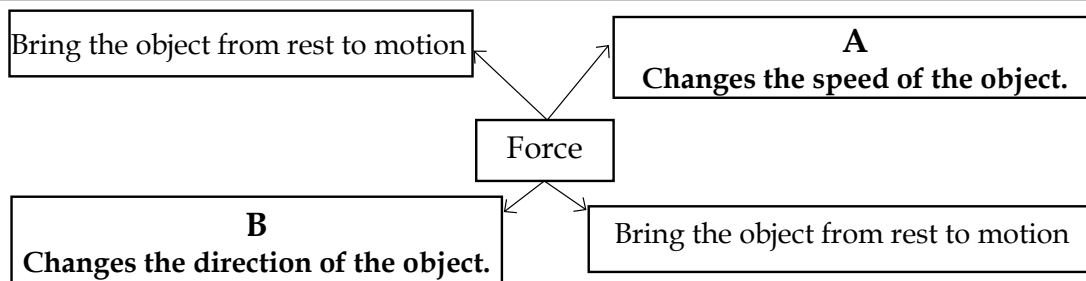
IV. Match :

	A		B		Answers
1		a	Oscillatory motion	b	Curvilinear motion
2					
3		c	Non- periodic motion	a	Oscillatory motion
4		d	Circular motion	c	Non- periodic motion



V. Fill up the blanks in accordance with their relation:

- The Motion of train – uniform motion. Motion of vehicles _____.
Ans. non – uniform motion.
- Periodic motion – The motion of moon which revolves around the earth.
Oscillatory motion – _____.
Ans : Motion of simple pendulum.

VI. Fill up the missing statement.**VII. Fill up the blanks with the help of examples:**

- Motion of the needle of a clock.
- Motion of an athlete of 100 m race
- Motion of flag wagging
- Motion of a car which goes in a circular path.
- The motion of a needle in a sewing machine.

Ans: 1. Oscillatory motion. 2. Linear motion. 3. Non- periodic motion
4. circular motion 5. periodic motion or uniform motion.

VIII. Two Mark Questions: Short answers:

- | | |
|--|---|
| 1. What is meant by the State of Rest?
When there is no change of position of an object with respect to time and if it remains stationery it is called rest. | 2. What are the types of Force?
(i) Contact Force;
(ii) Non-Contact Force |
| 3. What is a contact force?
When the force is in contact with the object then it is known as contact force. | 4. What is average speed of the object?
The distance travelled by an object in unit time is called average speed of the object. |
- 5. A bus moves with a speed of 40km and crosses 200km and then how many hours has that bus taken to travel?**

$$\text{Time (t)} = \frac{\text{Distance}}{\text{Average Speed}}$$

$$\text{Time (t)} = \frac{200 \text{ km}}{40 \text{ km/h}} = 5 \text{ hrs}$$

IX. Give Detailed Answers:

1. What is a force? What are its types?

Forces: Forces are push or pull by an animate or inanimate agency.

Types of Forces: (i) Contact forces; (ii) Non – Contact forces.

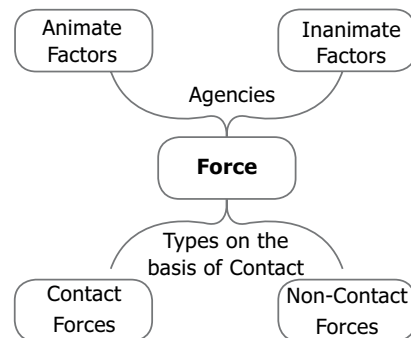
Contact Force: The force that is executed by touching the body is a contact force .

Eg. Kicking the foot ball

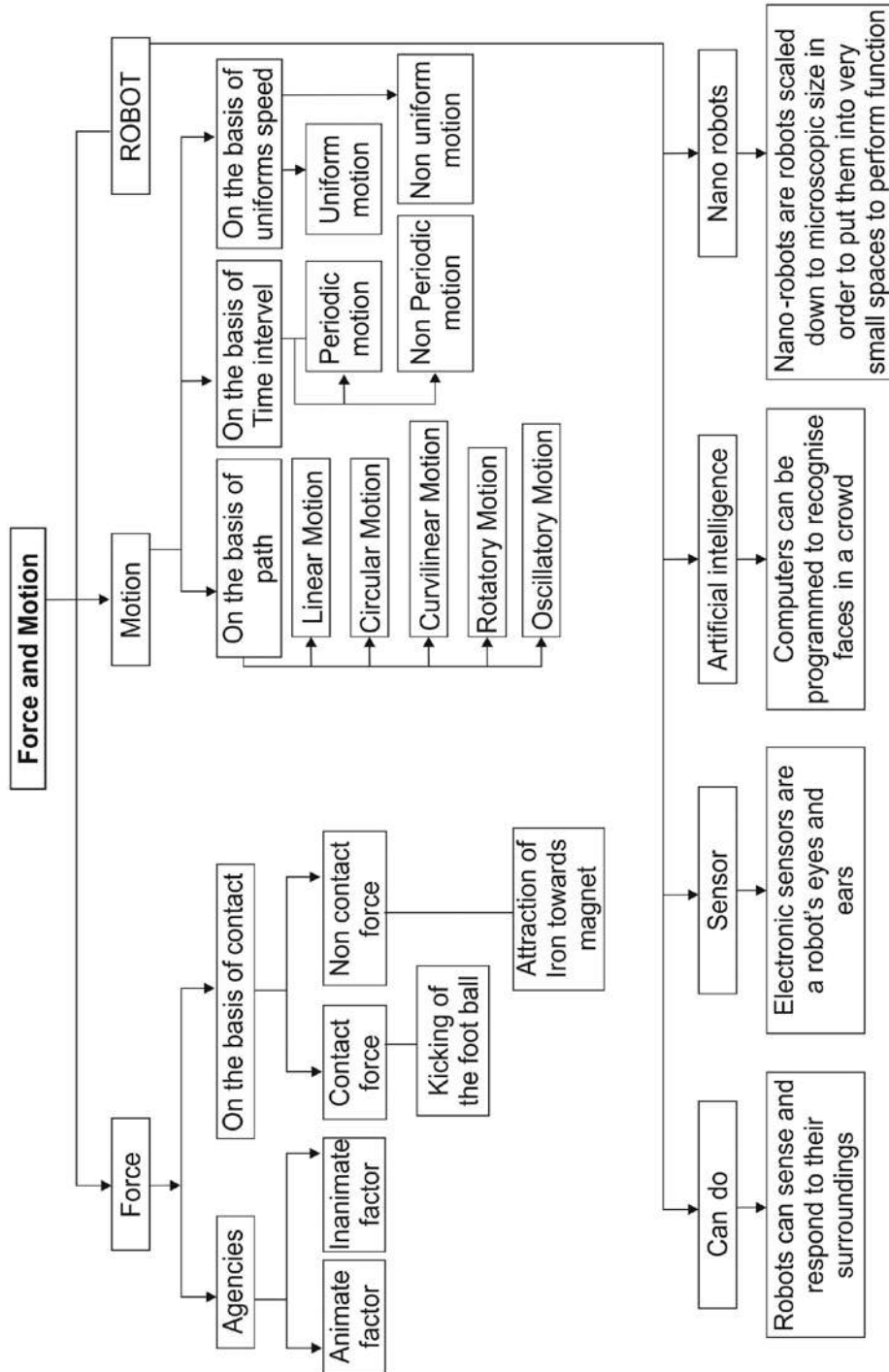
Non-Contact Force: The force is applied. Without touching the object then it is called as non contact force.

Forces can

- (i) Change the states of body from rest to motion or motion to rest.
- (ii) Either change the speed or direction or both of the body.
- (iii) Change the shape of the body.



MIND MAP



**UNIT
3**
MATTER AROUND US
PART I - BOOK BACK QUESTIONS
I. Choose the correct answer:

1. _____ is not made of matter
 a) Gold ring b) Iron nail c) Light ray d) Oil drop
Ans: a) Light ray

2. 200 ml of water is poured into a bowl of 400 ml capacity. The volume of water will be _____
 a) 400 ml b) 600 ml c) 200 ml d) 800 ml
Ans: c) 200 ml

3. Seeds from water-melon can be removed by _____.
 a) hand-picking b) filtration
 c) magnetic separation d) decantation **Ans: a) hand-picking**

4. Lighter impurities like dust when mixed with rice or pulses can be removed by _____.
 a) filtration b) sedimentation c) decantation d) winnowing
Ans: d) winnowing

5. _____ is essential to perform winnowing activity
 a) Rain b) Soil c) Water d) Air
Ans: d) Air

6. Filtration method is effective in separating _____ mixture
 a) Solid-solid b) Solid-liquid c) liquid-liquid d) liquid-gas
Ans: b) Solid-Liquid

7. Among the following _____ is not a mixture
 a) lemon juice b) Coffee with milk
 c) Water d) ice cream embedded with nuts.
Ans: c) Water

II. Fill in the blanks

1. Matter is made up of _____ **Ans: Atoms**
2. In solids, the space between the particles is less than in _____ **Ans: Liquids**
3. Grains can be separated from their stalks by _____ **Ans: Threshing**
4. Chillies are removed from 'upma' by _____ method. **Ans: Hand picking**



5. The method employed to separate clay particles from water is __ **Ans: Filtration**
6. Water obtained from tube wells is usually _____ water **Ans: Impure**
7. Which Among the following _____ will get attracted to a magnet?
(Safety pins, pencil and rubber band) **Ans: Safety pins**

III. State True or False. If false, correct the statement

- 1) Air is **not** compressible.
Ans: False. Air is Compressible.
- 2) Liquids have no fixed **volume** but have fixed **shape**.
Ans: False. Liquids have no fixed **shape** but have fixed volume.
- 3) Particles in solids **are** free to move.
Ans: False. Particles in solids **are not** free to move.
- 4) When pulses are washed with water before cooking, water is separated from them by **filtration**
Ans: False. When pulses are washed with water before cooking, the water is separated from them by **Decantation**.
- 5) Strainer is a kind of sieve which is used to separate a **liquid from solid**
Ans: True.
- 6) Grain and husk can be separated by winnowing.
Ans: True.
- 7) Air is a **pure substance**
Ans: False. Air is a **mixture**. (Or) Air is **not a** pure substance.
- 8) Butter from curd is separated by **sedimentation**.
Ans: False. Butter from curds is separated by **churning**.

IV. Complete the given analogy

1. Solid: Rigidity :: Gas: _____ **Ans: Highly compressible**
2. Large Inter-particle space: Gas:: _____: Solid **Ans: Little inter-particle space**
3. Solid : Definite shape :: _____: shape of the vessel. **Ans: liquids**
4. Husk-Grains: winnowing:: Sawdust-Chalk piece: _____ **Ans: Handpicking**
5. Murukku from hot oil: _____: Coffee powder residue from decoction
Ans: Strainer, Filtrate.
6. Iron-sulphur mixture: _____: Mustard seeds from Urad-dhal: Rolling
Ans: Magnetic Separation.

V. Match the following

a.

	Property		Example		Answers
1	Breaks easily (Brittle)	a	Metal pan	d	Mud pot
2	Bends readily	b	Rubber band	e	Plastic wire
3	Can be stretched easily	c	Cotton wool	b	Rubber band
4	Gets compressed easily	d	Mud pot	c	Cotton wool
5	Gets heated readily	e	Plastic wire	a	Metal pan

b.

	A	B	C
i	Separation of visible undesirable components	Water mixed with Chalk powder	Magnetic Separation
ii	Separation of heavier and lighter components	Sand and water	Decantation
iii	Separation of insoluble impurities	Iron impurities	Filtration
iv	Separation of magnetic components from non-magnetic components	Rice and stone	Hand-picking
v	Separation of solids from liquids	Husk and paddy	Winnowing

Answer:

	A	B	C
i	Separation of visible undesirable components	Rice and Stone	Hand-picking
ii	Separation of heavier and lighter components	Winnowing	
iii	Separation of insoluble impurities	Water mixed with Chalk powder	Decantation
iv	Separation of magnetic components from non-magnetic components	Iron impurities	Magnetic Separation
v	Separation of solids from liquids	Sand and water	Filtration

VI. Answer very briefly

- Define the term matter?**
Matter is defined as anything that has mass and takes up space. Matter is found in solid, liquid and gas.
- How can husk or fine dust particles be separated from rice before cooking?**
Before cooking, the husk or fine dust particles in rice are being separated by 'Sedimentation'. The lighter impurities float while heavier rice grains sink to the bottom. Then the water with the impurities is carefully poured away by decantation leaving clean rice at the bottom.
- Why do we separate mixtures?**
A mixture is an impure substance and contains more than one kind of particles. So, we have to separate mixtures.
- Give an example for mixture and justify your answer with reason.**
Milk is an example for mixture.
It contains water, fat, protein etc. Since two or more compounds are mixed in a physical combination, milk is a mixture.
- Define Sedimentation?**
Sedimentation is the deposition process of setting down of heavy solids in a mixture of liquid and an insoluble solid.
- Give the main difference between a pure substance and an impure substance.**

	Pure Substance		Impure Substance
1	Made up of only one kind of particles.	1	Has particles of other Substance mixed in it.
2	Cannot be separated by physical means.	2	Can be separated by physical means.

VII. Answer briefly

- A rubber ball changes its shape on pressing. Can it be called a solid?**
Yes. A solid has a certain shape and size. The shape of a rubber ball changes only if we squeeze it.
- Why do gases not have fixed shape?**
 - Gases possess more intermolecular space and less forces of attraction.
 - They can move freely at any direction.
 - They have the property of filling the entire part of a container by taking the shape of the container.

So, gases do not have fixed shape.
- What method will you employ to separate cheese (Paneer) from milk? Explain.**
Filtration:
 - Heat the milk
 - Add lime Juice or vinegar after few minutes
 - Cheese will float on the liquid
 - Use strainer to separate the cheese (paneer) from milk.

4. Look at the picture given below and explain the method of separation illustrated.



The given picture shows the 'Sieving' method of separation. It is used to separate the solid particles of different sizes. Example: Bran from flour; Sand from gravel.

5. How can you separate a large quantity of tiny bits of paper mixed with pulses/dal?

We can separate the mixture of a large quantity of tiny bits of paper and pulses/Dal by "Winnowing". The lighter papers will be carried by wind and heavier pulses/dals will fall closer and form a separate heap.

6. What is meant by food adulteration?

The process of mixing harmful and unwanted substances with the food stuffs that we buy in the market is called food adulteration

7. Mr. Raghu returns home on a hot summer day and wants to have buttermilk. Mrs. Raghu has only curd. What can she do to get buttermilk? Explain

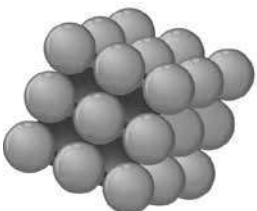
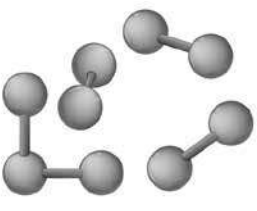
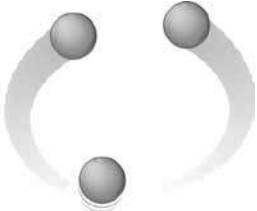
Mrs. Raghu has to take half a cup of curd, add half a cup of water to it and mix well. Now, she can serve buttermilk.

VIII. Higher Order Thinking Questions

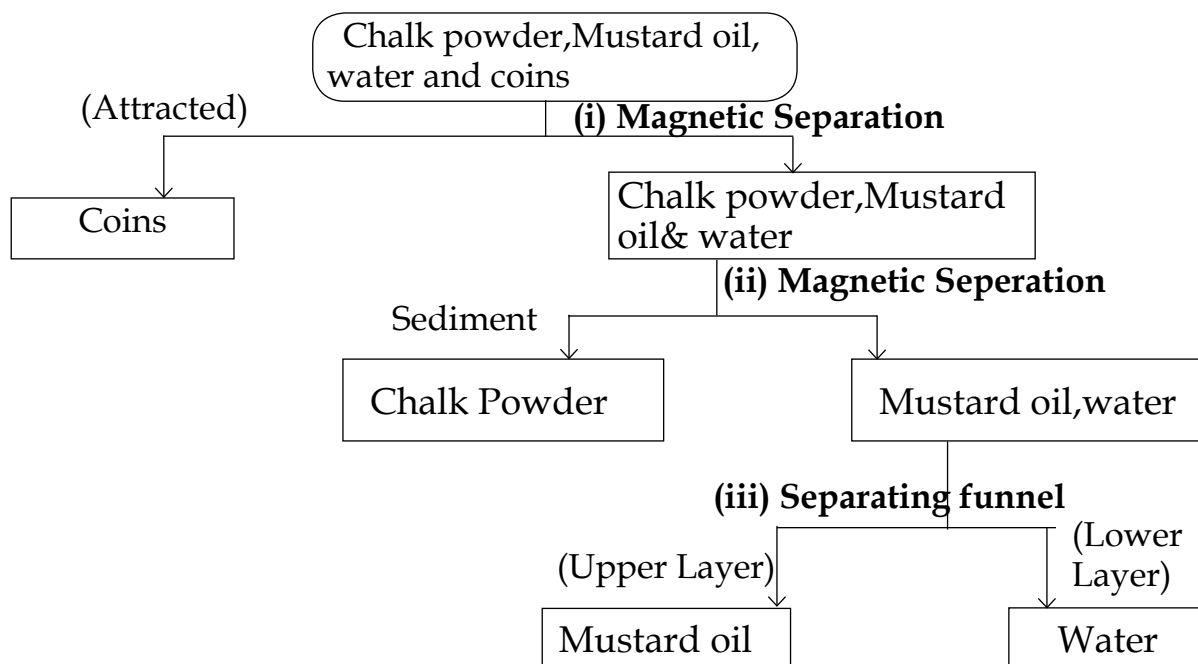
1. Distinguish the properties of solid, liquid and gas. Draw a suitable diagram.

a	Property	Solid	Liquid	Gas
(i)	Shape and Volume	Definite shape and volume	No Definite shape but has Volume	Neither Definite shape nor volume
(ii)	Compressibility	Not compressible	Slightly compressible	Highly compressible
(iii)	Particles Arrangement	Little space between the particles.	Greater space between the particles.	Greatest space between the particles.
(iv)	Inter molecular attraction	Very strong	Lesser than the solids	Least
(v)	Molecular motion	Cannot move freely	Move freely	Continuous, random motion.



(vi)	 Solid Ex. Stone	 Liquid Ex. water	 Gas Ex. air
------	---	--	---

2. Using suitable apparatus from your laboratory separate the mixture of chalk powder, mustard oil, water and coins. Draw a flow chart to show the separation process.



3. Justify your answer.

Arrangements of particles in three different phases of matter is shown above.

FIG 1



FIG 2

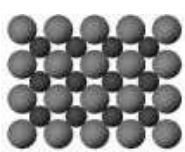


FIG 3



- a) Which state is represented by fig. 1?

Figure 1 represents a gas.

b) In which State will the inter particle attraction be maximum?

Inter Particle attraction is maximum in solids (fig. 3)

c) Which one of them cannot be contained in an open vessel?

A gas (fig. 1) cannot be contained in an open vessel.

d) Which one can take the shape of its container?

Liquid (fig.2) can take the shape of its container.

4. Malar's mother was preparing to cook dinner. She accidentally mixed ground nuts with urad-dhal. Suggest a suitable method to separate the two substances so that Malar can have ground nuts to eat.

The groundnuts shall be separated by hand picking method, because they are in different size, when compared with urad-dhal.

5. In a glass containing some water, tamarind juice and sugar is added and stirred well. Is this a mixture? Can you tell why? Will this solution be sweet or sour or both sweet and sour?

- A glass containing some water, Tamarind juice and sugar is a mixture.
- Because, it is made up of two or more ingredients that are physically separable.
- This mixture is both sweet and sour.

IX. Life Skills - Debate (For Students)

1. Debate on 'Food adulteration and detection'

X. Field Trip (For Students)

1. Visit a nearby paddy field and rice mill and note down the different separating techniques used there. Is technology replacing some traditional practices?

XI. Sequence Type

1. Write the sequence of steps you would use for making tea. (Use the words : mixture, dissolve, filtrate and residue).

- i) Take Tea powder and Milk.
- ii) Heat the milk, then add tea powder.
- iii) Add sugar to taste and, Stirr well.
- iv) The sugar will be dissolved in the mixture.
- v) Filter the mixture. Tea(filtrate) flows down through filter papaer.
- vi) Tea leaves settle as residue on the filter paper.

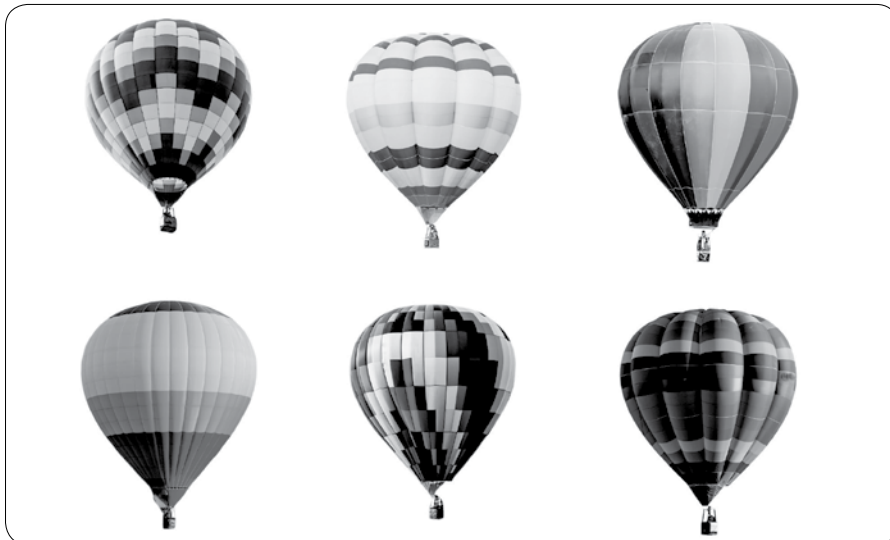
XII. Topic enrichment – Project

1. Make a fruit or vegetable salad. Give reasons why you think it is a mixture.
Apple, pomegranate, guava and grapes are cut into small pieces and a fruit salad is made. Since it contains four types of fruits, it is a mixture.



2. Connect with sports

Air is not a pure substance. It helps us in many ways from breathing to playing. Balloon sports are a very popular sport. Hot air is lighter than cool air. So, the balloons filled with hot air rise up. Find out more about hot air balloons.



- In hot air balloons, There is a basket to carry passengers.
- Air inside the balloon is heated by a heater.
- This makes the air inside the balloon lighter.
- Air out side the balloon is heavier.
- Hence the balloon rises up in the air.
- Hot air balloons are used for fun and weather observation.

PART II - ADDITIONAL QUESTIONS

I. Choose The Correct Answer

1. Which of the following are homogeneous in nature?

i) ice ii) wood iii) soil iv) Air

a) (i) and (iii) b) (ii) and (iv) c) (i) and (iv) d) (iii) and (iv)

Ans: c) (i) and (iv)

2. Inter molecular forces of attractions is maximum in

a) liquids b) plasma particles c) solids

d) gases Ans: c) solids

3. Which among the following is not a matter?

a) Electron b) Blood c) Moon rock

d) Humidity

Ans: a) Electron

4. The method of separating substances based on size, color and shape is called

a) Hand picking b) Winnowing c) Threshing

d) sieving.

Ans: a) Hand picking

5. Pure rava when adulterated with wheat flour is separated by
 a) Sieving b) Filtration c) Winnowing d) Threshing

Ans: a) Sieving

II. Match the following

	Column A		Column B		Answer
1	Separation of salt from salt water	a	Magnetic separation	b	evaporation
2	Separation of tea leaves from tea extract	b	evaporation	d	filtration
3	Separation of sand and iron fillings	c	Churning	a	Magnetic separation
4	Separation of butter from curds	d	filtration	c	Churning

III. Fill in the blanks

- _____ particles are tightly packed into a definite shape. Ans: Solid
- The tendency of particles to spread out in order to occupy the available space is _____. Ans: diffusion
- The purest form of gold is denoted by _____. Ans: 24 carat
- Milk is a _____. Ans: mixture.
- The principle of _____ is used in washing machines. Ans: centrifugation

IV. Very short answer.

- Mention any two characteristics of the particles of matter.**
 i) Particles of matter have a lot of space in between them.
 ii) Particles of matter attract each other.
- What type of matter glass is?**
 Glass is looking like a solid, but not. It is actually a very slow moving liquid.
- What is meant by compound?**
 Compound is the substance formed by the chemical combination of two or more elements.

Bran from flour is separated by _____ method

Bran from flour is separated by 'sieving'.
 Solid particles of different sizes can be separated by sieving.

- What is Decantation?**
 After sedimentation, the supernatant liquid is slowly poured out from the container without disturbing the sediment.

V. Answer in detail

- What are the similarities between a gas and a liquid?**
 - Neither a gas nor a liquid has a definite shape.
 - The particles of gases and liquids can move. We call this movement as diffusion.



- Liquids can evaporate into gases and the gases can condense into liquids.
- They can have the property of compressibility for some extent.

2. How do decantation and filtration differ and which is faster?

Filtration	Decantation
Filter papers should be used Complete separation of mixture is possible. Pouring the entire solution through a filter. Ex: Tea leaves from water. AC dust filters (solids from liquids/gases)	No need to use any kind of filter papers. No complete separation of mixture. Keeping some solid things in the original container Ex: cream from milk (liquid layer from precipitate)

Note: Normally filtration will give a better separation than decantation.

MIND MAP

