

Session- 2020-21

Physics Question Bank

Std 7

First Term Portion

Chapter-1

Physical Quantities and measurement

Q1. Define Area and write its SI unit.

A. The amount of surface occupied by an object or a place is called its area

Unit-SI unit is m^2

Q2. Define one are, one Square KM.

A. It is a surface area of a Square whose each side is equal to 10m

One Square Kilometer – It is a Surface area of a Square whose each side is 1Km long.

Q3. Relationship between the units of area

$$1\text{mm}^2 = 10^{-2}\text{cm}^2 = 10^{-4}\text{dm}^2 = 10^{-6}\text{m}^2$$

$$1\text{cm}^2 = 10^{-2}\text{dm}^2 = 10^{-4}\text{m}^2$$

$$1\text{dm}^2 = 10^{-2}\text{m}^2$$

$$\text{One are} = 100\text{m}^2$$

$$1\text{m}^2 = 10^{-2}\text{are}$$

$$1\text{hector} = 100\text{are} = 10^4\text{m}^2$$

$$1\text{m}^2 = 10^{-4}\text{hector}$$

$$1\text{km}^2 = 100\text{hector} = 10^4\text{are}$$

One Square meter-The Area of a square whose each side is 1m long.

Area of some regular objects

- 1) Area of Square = side \times side
- 2) Area of Rectangle = $1/2 \times (b \times h)$
- 3) Area of Circle = πr^2

Q: Define Volume write its SI Unit

The space occupied by a substance is called volume.

Unit – S.I unit is m^3 other unit is cm^3

Q: Define one cubic meter-

Ans: It is a volume occupied by a cube whose one side is 1m

Formula for calculating the volume of some irregular bodies

Volume of a cube = $side^3$ (unit)³

Volume of a cuboids = $l \times b \times h$ (unit)³

Volume of a cylinder = $\pi r^2 h$ (unit)³

Volume of a sphere = $\frac{4}{3}\pi r^3$ (unit)³

1cm cube –It is volume occupied by a cube whose each side =1cm

Q: Define Density. Write its SI and CGS Unit and state the relation between these units.

Ans: It is defined as mass per unit volume of a substance

Density = mass/volume

$D = m/v$

SI Unit- kg/m^3 or $kg\ m^{-3}$

CGS - gm/cm^3 or $gm\ cm^{-3}$

Relation $\rightarrow 1\ gm/cm^3 = 1000\ kg/m^3$

Q: The Density of a substance is $7.8\ gm/cm^3$. What does the statement mean?

Ans. It means the mass of $1cm^3$ of that substance is 7.8 gr or the volume 7.8gr of this substance is $1cm^3$.

Q: How the density of a substance changes with temperature

Ans. As the temperature of the substance increases the density decreases and vices versa

Q: Define Speed .write its SI Unit ?

Ans: Speed is defined as the rate of change of distance with time

Speed = distance / time

SI unit = $m/s = ms^{-1}$

Q: Define Uniform speed, Non Uniform Speed, Average Sped

Uniform Speed - If a body covers equal distance in equal intervals of time then speed is known as uniform speed.

Non Uniform speed - If a body covers unequal distances in equal intervals of time then the speed is non-uniform speed.

Average speed – It defined as the ratio of total distance covered to total time taken.

Average Speed = $\frac{\text{Total distance}}{\text{Total time}}$

Chapter-2

Force Pressure and Motion

1. Define rest and motion.

Ans. **Rest**-When the position of a body with respect to its surroundings does not change with respect to time, then the body is said to be at rest.

Motion:- -When the position of a body with respect to its surroundings changes with respect to time, then the body is said to be in motion.

2. Write the types of motion with examples.

Ans. **Translatory motion** : The motion in which all the particles of a body moves through the same distance in same time .

e.g. ball rolling on a ground, a girl sliding down a slope.

Translatory motion is of two kinds.

i. Rectilinear motion: - when a body moves along a straight line then the motion is said to be rectilinear motion.

e.g. coins moving on a carrom board.

ii) Curvilinear motion:- when a body moves along a curved path then the motion is said to be curvilinear motion.

e.g. a ball thrown upward at an angle.

iii) Rotatory motion :- A motion in which a body moves about a fixed axis without changing its position.

e.g. a spinning wheel, a ceiling fan.

iv) Circulatory motion:-A body is said to be in circular motion if it moves in a circular path around a fixed point.

e.g. the earth revolving around the sun.

v) Oscillatory motion:-The to and fro or the back and forth motion described by an object along the same path without any change in the shape and size of the object.

e.g. motion of a pendulum in a pendulum clock.

vi) Vibratory motion:- It is a kind of oscillatory motion in which the moving object undergoes rapid to and fro motion.

e.g. all musical instruments produce sound due to vibratory motion.

vii) Periodic motion :- A repetitive motion which repeats itself after a fixed time interval of time.

e.g. motion of a swing.

viii) Non-Periodic Motion:- A repetitive motion which repeats itself but not at affixed interval of time is called as non periodic motion.

e.g. motion of students during a break.

ix) Random motion:- An object which suddenly changes its motion from one kind to other kind.

e.g. flying mosquito

x) Uniform motion:- If a body covers equal distances in equal interval of time along the same straight line.

e.g. a flying aeroplane in a particular direction at a constant speed.

xi) Non uniform motion:- If a body covers unequal distances in equal interval of time along the same straight line.

e.g. a cyclist cycling along a busy street.

3) Define speed. Write its SI unit. How it is related to its CGS unit.

Ans: The rate of change of motion is called as speed. Its SI unit is m/s. CGS unit is cm/s.

Relation:- $1\text{m/s} = 100\text{ cm/s}$

4) Define uniform speed, non uniform speed and average speed.

Ans:- **Uniform speed:-** If a body covers equal distances in equal interval of time.

Non uniform speed:- If a body covers unequal distances in equal interval of time.

Average speed:-The average distance covered by a moving body per unit time when the body is moving with variable speed is called its average speed.

Total distance covered

Average speed= -----

Total time taken to cover the distance.

5) Define velocity. Write its SI unit.

Ans:- The rate of change of motion in a specified direction.

OR

The distance covered by a body in unit time in a specified direction is called velocity.

The SI unit of velocity is m/s.

6) Differentiate between mass and weight.

Ans

<u>Mass</u>	<u>Weight</u>
<p>1. It is the amount of matter contained in a body.</p> <p>2. it is a constant quantity, it does not change with the position or surrounding of the body.</p> <p>3. It is measured by beam balance.</p> <p>4. Its SI unit is kilogram (Kg).</p> <p>5. It can never be zero</p>	<p>1.It is the force with which the earth attract a body towards its centre.</p> <p>2.It is a variable quantity and changes with the change in the acceleration due to gravity of earth.</p> <p>3. It is measured by spring balance.</p> <p>4. Its SI unit is newton (N).</p> <p>5. It can be zero if no gravity is acting on the body.</p>



Chapter-3

Energy

1. Under what condition can it be said that work is done?

A. Work is said to be done only when the applied force causes some displacement in the body in the direction of the force applied.

2. Give an example where force is applied and the work done is zero.

A. A boy when pushing a wall is doing zero work as the displacement is zero.

3. Convert 10 kilocalories into joules.

A. 1 calorie = 4.2 joules

1 kilocalorie = 1000 calories

= 1000 x 4.2 = 4200 joules

10 kilocalories = 4200 x 10 = 42,000 joules.

4. How can you say that light is a form of energy?

A. When a strong beam of light is allowed to fall on fine dust particles, they start moving. This suggests that light is capable of doing work, so it is a form of energy.

5. Give the energy changes when we switch on a torch light.

A. When we switch on a torch light, the chemical energy of the battery changes into electrical energy. The electric energy first changes into heat energy and then into light energy.

6. Give an example of change of potential energy into kinetic energy.

A. When an arrow is stretched in a bow, potential energy is stored in the string. As soon as the string is released, the potential energy changes into kinetic energy of the arrow.

7. Name a device that changes sound energy to electric energy.

A. The device that changes sound energy into electric energy is microphone.

8. How is light energy changed into chemical energy?

A. Light energy changes into chemical energy by a natural process called photosynthesis. This process takes place in the leaves of a plant.

9. A boy does a work of 600 J while pushing a load through a distance of 15 m. Find the magnitude of the force applied by the boy.

A. $W = 600 \text{ J}$, $S = 15 \text{ m}$

As, $W = F \times S$

So, $600 = F \times 15$

Hence, $F = \frac{600}{15} = 40 \text{ N}$

10. Calculate the work done when a force of 20 N is applied to move an object to 1 km.

A. Given: $F = 20 \text{ N}$, $S = 1 \text{ km} = 1000 \text{ m}$

$$\begin{aligned}\text{So, } W &= F \times S \\ &= 20 \times 1000 \\ &= 20,000 \text{ J}\end{aligned}$$

Chapter- 4

Light Energy

1. Define light. Write its speed in air.

Ans. Light is an invisible form of energy which produces the sensation of sight. Its speed in air is $3 \times 10^8 \text{ ms}^{-1}$ or $3 \times 10^5 \text{ kms}^{-1}$.

2. Define the following.

i) Luminous Objects:- Objects which can emit the light of their own

e.g. sun, stars, candle, bulb etc.

ii) Non Luminous Objects:- Objects which cannot emit the light of their own, but reflect the light energy falling on them.

e.g. moon, chair, book, vehicles etc

iii) Transparent material:- Materials in which light can pass completely. e.g. air, water and glass etc.

iv) Translucent material:- Materials in which light can pass partially. e.g. smoked glass, fog, mist etc.

v) Opaque material:- Materials in which light cannot pass. e.g. metals, wood, wall etc

vi) Convergent beam of light:- When light rays coming from different directions meet at a point.

vii) Divergent beam of light:- When light rays starting from a point travelling different directions.

viii) Rectilinear propagation of light:- The property of light travelling in a straight line path is known as rectilinear propagation of light.

ix) Shadow:- When an opaque object is placed in the path of light it creates a region of darkness or partial light.

Unit 2

Reflection of Light

3) What is reflection? Write its laws.

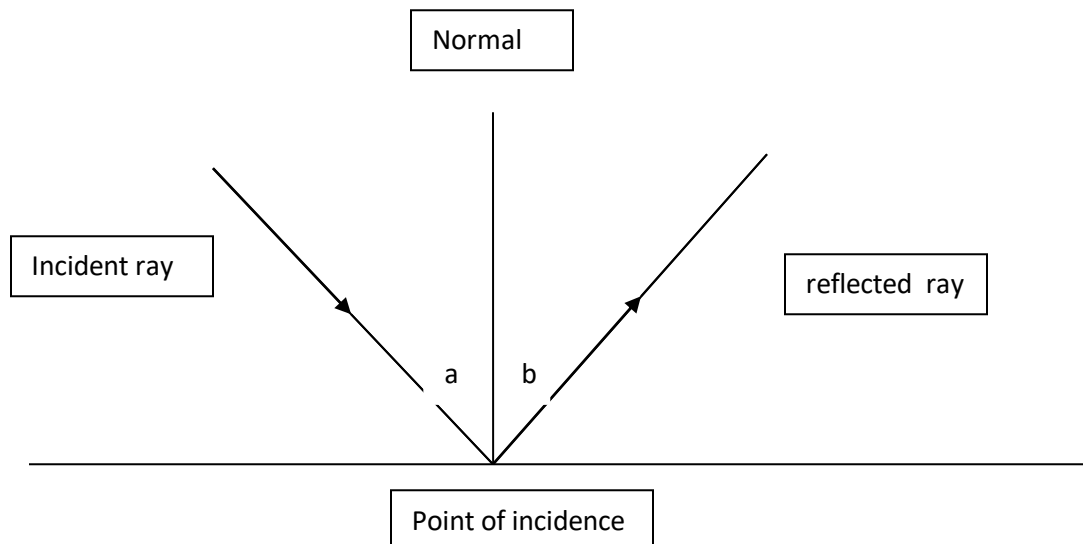
Ans: The bouncing back of light in to the same medium after striking on a surface is known as reflection.

Laws of reflection:-

Law 1:- The incident ray, the reflected ray and the normal at the point of incidence lie on the same plane.

Law 2:- The angle of incidence is equal to the angle of reflection.

4) Draw a diagram for the verification of laws of reflection.



General terms :-

Mirror:- Any smooth polished surface which can turn back the rays of light in to the same medium.

Incident ray:-A ray of light which travels from an optical medium towards a mirror.

Reflected rays:-A ray of light which bounces off the mirror surface where incident ray strikes.

Normal:-The perpendicular drawn at the point of incidence to the surface of mirror is called normal.

Angle of incidence:-The angle between the incident ray and the normal.

Angle of reflection:- The angle between the reflected ray and the normal.

4) What is lateral inversion? Give a one application of it.

Ans:- The phenomenon due to which the left side of an object appears as the right hand side in its image and vice versa is called lateral inversion.

Application: - The word ambulance is written in reverse order so that the vehicle in front of the ambulance can read the word in correct order due to lateral inversion in the rear view mirror and can give side to the ambulance to go ahead.

5) Write the characteristics of image formed by a plane mirror.

Ans:- The image is virtual, erect, same size as that of the object, laterally inverted and formed as far behind the mirror as the object is in front of it.

6) Define regular and diffused reflection.

Ans:- Regular reflection:- when a parallel beam of light striking on a smooth and polished surface is reflected as a parallel beam of light.

It causes a strong glare and not good for eyes.

Irregular reflection:- when a parallel beam of light striking on a smooth and polished surface is reflected in different direction.

We can see different things around us due to irregular reflection only.

7) Differentiate between real and virtual image.

Ans:-

Real image	Virtual image
1. It can be taken on a screen.	1. It cannot be taken on a screen.
2. Light rays actually meet at a point after reflection.	2. The rays appear to meet at the point of reflection.
3. It is always inverted	3. It is always erect but laterally inverted.

8) Write three uses of Plane mirror.

Ans : i) They are used as looking glass.

ii) Used by barbers to show the customer the back side of his head.

iii) Used in solar cooker to reflect the light rays of sun in to the interior of solar cooker.

9) What is primary colour? Give examples.

Ans:- Primary colours are the colours which cannot be made from any other colour.

e.g. red, green and blue are primary colour.

10) What is secondary colour. Give examples.

Ans:-The secondary colour is the one which is formed by adding any two primary colours.

e.g. Green + Blue = Cyan

Green + Red = Yellow

Blue + Red = Magenta

Green + blue + Red = White

11) Why a parrot appears green in white light?

Ans:-Because the pigments of in the feathers absorb all the colours of white light except green. As the green colour is received by the eye the parrot appears green.

Session- 2020-21

Physics Question Bank

Std 7

Second Term Portion

CHAPTER 5-HEAT

UNIT 1- HEAT ENERGY AND ITS GENERAL EFFECTS

STUDY QUESTIONS

1a. Define heat energy and its units.

Ans- Heat is an invisible form of energy which causes in us the sensation of hotness or coldness.

SI unit of heat – Joule and 1 joule of work is said to be done when a force of 1 N displaces, the body through 1m in its own direction.

CGS unit of heat- Erg

And unit is calorie and 1 calorie is the amount of heat energy required to raise the temperature of one gram of water through 1 degree Celsius.

b .Name four effects which the heat energy can bring about in a material body.

Ans- Heat energy brings about:

a-Change in temperature

b- Change in dimensions

c- Change in state

d- chemical/biological change

2. What do you understand by the term “change of state”?

Ans- The process due to which a substance changes from one physical state to another physical state by the absorption or release of heat energy, is known as change of state.

3. Define:

a-Fusion-The process due to which solids change into liquid state at some fixed temperature, by the absorption of heat energy is known as fusion.

b-Fusion point-The fixed temperature at which solids change into liquid state due to the process of fusion is known as fusion point.

c-Solidification- The process due to which a liquid changes to solid state at some fixed temperature, with the release of heat energy is known as Solidification.

d-Solidification point- The fixed temperature at which a liquid change into solid state due to the process of solidification is called solidification point.

4a.How does the fusion point and solidification point of ice and water compare numerically?

Ans- Fusion point of ice is equal to solidification point water is equal to 0 degree Celsius.

b- Describe different sources of heat energy.

Ans- 1 Sun: The sun produces enormous amount of heat and light energy due to fusion of hydrogen atoms.

2 Earth: The Earth is very hot from inside. In the volcanic regions, water is pumped deep into the earth with the help of pipes. This water changes into superheated steam, which is used as heat energy for different purposes.

3 Wood or Biomass: Biomass consists of cow dung, dried leaves etc. The biomass or gobar gas which mainly contains methane and is used as a cooking gas as a source of heat energy.

4 Coal and Petroleum: Coal and Petroleum are formed millions of years ago when large plants and animals were buried inside earth's crust and were under high pressure and temperature. On burning coal and petroleum, heat energy is produced.

5. Define-

a- Vaporization: The process due to which a liquid change into gaseous state at some fixed temperature with the absorption of heat energy is known as vaporization.

b- Vaporization point: The fixed temperature at which a liquid state changes into gaseous state, due to the process of vaporization, is known as vaporization point.

c-Condensation: The process due to which a gas changes into liquid state at some fixed temperature, with the release of heat energy is known as condensation.

d-Condensation point: The fixed temperature at which a gas changes into liquid state, due to the process of condensation is condensation point.

6. How do the vaporization point of water and condensation point of steam compare numerically?

Ans- Vaporization point of water is equal to condensation point of steam is equal to 100 degree Celsius.

7a.What is evaporation?

Ans- The change of liquid stat into its vapor state at any temperature below its boiling point is called evaporation.

b. Give two differences between vaporization and evaporation.

Vaporization	Evaporation
1-The process by which a liquid change into gaseous state at a fixed temperature.	1- The process by which liquid state changes into gaseous state at any temperature.
2- It is a fast process.	2- It is a slow process.

8a. What do you understand by the term sublimation?

Ans- The process by which a solid directly changes into gaseous state on heating and gaseous state directly changes into solid state on cooling is called sublimation.

b. Give two of substances that sublime.

Ans- Two examples are Naphthalene and ammonium chloride.

9. Give two examples to prove that heat energy bring about a chemical change.

Ans- Ex-1: Calcium carbonate on strong heating changes to form calcium oxide and carbon dioxide.

Ex-2: Potassium chlorate on strong heating decomposes to form potassium chloride and oxygen gas.

10. By giving four examples define.

Ans- a- Flammable substances: The substances which burn easily in air or oxygen.

Ex-Coal, diesel, wood, paper etc.

b-Nonflammable substances: The substances that do not burn easily in air or oxygen. Ex-Gold, iron, glass, silver etc.

UNIT 2-TEMPERATURE AND ITS MEASUREMENT

STUDY QUESTIONS

1.What is thermometer? Describe briefly the construction of Celsius thermometer.

Ans- A thermometer is a device that measures the temperature of a body.

(i)A Celsius thermometer is common laboratory equipment.

(ii) It works on the principle of thermal expansion of liquids. It consists of a very fine glass capillary tube having a thin bulb of mercury at one end. The capillary tube is protected by a thick glass stem. The stem is graduated from -10 degree Celsius to 100 degree Celsius. Its lower fixed point is 0 degree Celsius and upper fixed point is 100 degree Celsius.

2a.What do you understand by the term “standard points of a thermometer”?

Ans- The fixed points marked on the stem of a thermometer are called standard points or fixed points.

b. Define lower standard point and state its value in degree Celsius, degree Fahrenheit and kelvin.

Ans- The lower standard point of a thermometer is the melting point of pure ice at a pressure of 76cm of mercury (normal atmospheric pressure). Its value is 0°C, 32°F and 273K in °C, °F and kelvin respectively.

c-Define upper standard point and state its value in °C, °F and kelvin.

Ans- The upper standard point of a thermometer is the boiling point of pure water at a pressure of 76cm of mercury. Its values are 100°C, 212°F and 373 K in °C, °F and kelvin respectively.

3.State three most important qualities of a thermometric liquid.

Ans- a: It should expand uniformly so that a linear scale could be marked on the stem of the thermometer.

b: It should be opaque, colored and shining so that it is easily visible in the capillary tube.

c: It should be easily available in pure form.

4. Why is mercury used as a thermometric liquid? Give three reasons.

Ans- a:Mercury has 357°C high boiling point and -39°C low freezing point.

b:Mercury does not stick to the sides of the capillary tube. Thus it helps in recording accurate temperature.

c:Mercury is opaque and shining. Thus it can be easily seen as a fine thread in the capillary tube.

5. Why is alcohol used as a thermometric liquid in certain situations? Give two reasons.

Ans- a: Freezing point of alcohol is less than -100°C. Thus, alcohol thermometers can be used to measure very low temperatures such as temperature in the arctic and Antarctic regions.

b: Alcohol can be brightly colored, and hence, can be easily seen in the glass capillary tube.

6. State the formulae for converting temperature in Celsius scale into-

a) Kelvin scale: $t\text{ }^{\circ}\text{C} = (t + 273)\text{ K}$

b) Fahrenheit scale: $\frac{C}{5} = \frac{F-32}{9}$

or, $F = \frac{9C}{5} + 32$

7. Convert 149°F into °C

a. $C = \frac{5}{9}(F-32)$

$= \frac{5}{9}(149-32)^\circ\text{C}$

$= 5 \times 13^\circ\text{C}$

$= 65^\circ\text{C}$

b. $65^\circ\text{C} = (65+273) \text{ K}$

$= 338 \text{ K}$

8. Convert -13°F into °C

a. $C = \frac{5}{9}(F-32)$

$= \frac{5}{9}(-13-32)$

$= 5 \times -5$

$= -25^\circ\text{C}$

b. $-25^\circ\text{C} = (-25+273) \text{ K}$

$= 248 \text{ K}$

9. Convert 75°C into

a. temperature in Kelvin = temperature in °C+273

$= (75+273) \text{ K} = 348 \text{ K}$

B : $\frac{C}{5} = \frac{F-32}{9}$

$\Rightarrow \frac{75}{5} = \frac{F-32}{9}$

$\Rightarrow 15 \times 9 = F-32$

$\Rightarrow F = 135+32 = 167^\circ\text{F}$

10.Convert -30°C into

a. Temp in kelvin=Temp in °C +273

$$=(-30+273)$$

$$=243K$$

b. $C \div 5 = (F-32) \div 9$

$$\rightarrow -6 = (F-32) \div 9$$

$$\rightarrow -6 \times 9 = F-32$$

$$\rightarrow -54 + 32 = F$$

$$\rightarrow F = -22$$

UNIT – 3

Q 1.What do you mean by thermal expansion?

Ans-The expansion produced in matter due to the absorption of heat energy is called thermal expansion.

Q 2.Name the kinds of expansion of matter. Define all the kinds briefly.

Ans-The expansion in matter is divided into three classes,

i)Linear expansion: The increase in length of a solid when heated is called linear expansion.

ii)Superficial expansion: The increase in area of a solid when heated is called superficial expansion.

iii)Cubical expansion: The increase in volume of substance when heated, is called cubical expansion.

Q 4.Why does the iron rim to be mounted on a wooden cart wheel have a slightly smaller diameter than the wooden wheel?

Ans-This is because the iron rim is heated to red hot and then lifted by fire tongs. The iron rim easily slips over wooden wheel as its diameter increases due to heating. Cold water is poured over the iron rim. It contracts and holds the wooden wheel very tightly.

Q 5. Why are small gaps left in between the rails?

Ans-In summer due to excess of heat, the iron rails expand causing bending of rails. To avoid the derailment of train due to expansion small gaps are left in between the rails.

Q 6. Why are the girders supporting the bridge not fixed in the walls of the pillars?

Ans-The girders supporting the bridge are not fixed in the walls of pillars because they expand on heating and contract on cooling. This can break the pillars and bridge can be damaged.

Q 7. Why are the telephone or telegraph wires laid in summer kept slightly loose, while in winter they are kept tight?

Ans-When these wires are laid in summer, they are kept slightly loose, so that it allows contraction in winter. If they are laid in winter, they are kept very tight, so that it allows for expansion during summer.

Q 8. Describe principle and function of fire alarm?

Ans-Different metals expand differently on heating to the same temperature.

In case of fire alarm, the unequal expansion of bimetallic strip when it gets heated and bends making the electric circuit complete and hence the electric bell starts ringing.

Q 9.a) Define thermal expansion of liquids.

Ans-The expansion of liquids due to the heating of the container in which they are kept is called thermal expansion of liquids.

b) How can you say different liquids have different rates of expansion for the same rise in temperature?

Ans-Take three similar bottles and fill one of them with ethyl alcohol, the second with water and the third with olive oil. Fix soda straws in them and mark the level of each liquid in soda straw. Place the bottles in a trough containing hot water. It is seen that the increase in levels of liquids is different. So, it is proved that different liquids have different rates of expansion for the same rise in temperature.

Q 10.a) Define thermal expansion of gases?

Ans-The expansion produced in gases due to the absorption of heat energy is called thermal expansion of gases.

b) How can you say expansion of gases is very large as compared to the solids or the liquids?

Ans-To prove that expansion of gases is very large as compared to the solids or liquids,

Take a clean empty bottle. This bottle is filled with hydrogen gas. Fix a deflated rubber balloon over the mouth of the bottle. Place the bottle in a trough of hot water. In a few minutes we will observe that the balloon gets inflated.

UNIT- 4

Q 1.a) What do you understand by the term conduction of thermal energy? In what kind of state of matter does conduction take place?

Ans- The process of transmission of heat energy in solids without the actual movement of particles from their position is called conduction. Conduction takes place in solid state of matter.

b) Why is conduction not possible in case of liquids and gases?

Ans-In liquids and gases molecules are loosely packed and can change their positions so conduction is not possible.

c) Is conduction possible through vacuum? Give reason for your answer.

Ans- Conduction is transfer of heat from particle to particle without actual movement of particles. In vacuum there is no medium, so, conduction is not possible.

Q 2.a) What are good conductors? Give four examples of good conductors.

Ans-The substances which allow the heat energy to flow through them easily are called good conductors of heat. eg- copper, gold, iron, graphite etc

b) What are bad conductors? Give four examples of bad conductors?

Ans- The substances which do not allow heat energy to flow through them easily are called bad conductors. eg: wood, plastic, glass, mica

Q 4. Give three practical applications of good conductors.

Ans- i) Mercury is used as a thermometric liquid as it is a good conductor of heat.

ii) Tip of soldering rod is made of copper as it readily conducts away heat to the solder.

iii) Cooling coils of air conditioners and refrigerators are made of copper as they readily conduct away heat.

Q 5.a) Why do we wear loose woollen clothes in winter?

Ans- Because woollen yarn contains a large amount of trapped air. Since air is a bad conductor of heat, it does not allow the body heat to flow outward. As our body stops losing heat, we feel warm.

b) Why do birds puff up their feathers on a cold day?

Ans- As the birds puff up air is trapped within its feathers. Air being a bad conductor does not allow the body heat to escape. This keeps the bird warm in winter.

c) Why are the houses with thatched roofs cooler in summer than the concrete houses?

Ans- The houses with thatched roofs are cooler in summer as compared to concrete houses because the thatched roof contains a large amount of trapped air. Air being a bad conductor of heat does not allow the heat from outside to flow in.

e) Why does an iron chair feel colder than a wooden chair in winter?

Ans- Iron conducts heat better than wood. Since our body temperature is warmer, the iron chair absorbs more heat as compared to wooden chair (since wooden chair is comparatively a bad conductor of heat).

f) Why are ice blocks wrapped in saw dust or woollen blanket?

Ans- Ice blocks are wrapped in saw dust to prevent melting. The saw dust contains a large amount of trapped air, which acts as an insulator and does not allow the heat from outside to reach ice.

h) Why does a marble floor feel colder in winter than a carpeted floor?

Ans-A cold marble floor transfers heat quickly away from your feet, while a carpet prevents that flow from occurring. That makes the marble floor colder in winter than a carpeted floor.

Q 8.a) What do you understand by the term ventilation? How do convection currents in air help during ventilation?

Ans-The process by which impure and warm air inside a room is continuously replaced by fresh air from outside is called ventilation. The cold and fresh air from doors and windows flow in. The continuous circulation of air is maintained by convection currents.

b) Describe black body radiation with proper examples.

Ans-When radiant heat is incident on the surface of some solid material, a part of it can be absorbed, whereas a part of it can be reflected. It is the absorbed part which is going to raise the temperature of the solid body.

Furthermore, it has been found that the darker or blacker the body, more is the heat radiation absorbed and hence the higher is the rise in temperature .

Q 9.a) Why do we wear white or light colored clothes in summer?

Ans-We wear white or light-colored clothes in summer, because white bodies are poor absorbers and good reflectors of radiant heat. So, less heat is transmitted to the body and hence one feels comfortable.

b) Why do we wear black or dark colored clothes during winter?

Ans-We wear black or dark colored clothes during winter because black bodies are good absorbers of heat, So, the radiant heat from the surroundings rapidly reaches the body and one feels warm.

c) Why is the radiator of a motor car engine painted black?

Ans-The radiator of a motor car engine is painted black, so they can rapidly radiate heat to surroundings. In doing so the water flowing around the engine loses heat rapidly and hence the engine works smoothly.

d) Why are syntex water tanks painted white in hot countries?

Ans-The syntex water tanks are painted white, because white bodies are good reflectors and poor absorbers of radiant Heat. South water in the tanks keep cool in summer on account of less absorption of radiant heat.

EXTRA QUESTIONS OF HEAT

1, Define the following

Heat: An invisible form of energy which causes the hotness or coldness

Change of State : The process due to which a substance changes from one physical state to another with the absorption or release of heat energy.

Fusion point : The fixed temperature at which a solid change into liquid state is known as fusion or melting point

Solidification point: The fixed temperature at which a liquid change into solid state is known as freezing point or solidification point.

Vaporization point: The fixed temperature at which a liquid state changes to gaseous state is known as boiling/vaporization point.

Condensation Point: The fixed temperature at which a gaseous state of matter changes to liquid state is known as condensation point

Sublimation: The process in which a solid directly change into gas without passing through the liquid state.

2. Write the effects of heat energy

Ans. I) Change in temperature

ii) change in dimensions

iii) change in state

iv) Chemical changes in matter

3. Write the SI and CGS unit of heat and their relation

Ans. SI Unit- Joule CGS Unit– erg

Relation:- $1 \text{ joule} = 10^7 \text{ ergs}$

4. Define temperature lower fixed point and upper fixed point of thermometer

Ans. Temperature: The degree of hotness and coldness of a body.

Lower fixed point: The melting point of pure ice at a pressure of 76 cm of mercury is taken as lower fixed point. Its value is 0°C .

Upper fixed point: The boiling point of pure water at a pressure of 76 cm of mercury is taken as upper fixed point.

Its value is taken as 100°C

5. Why mercury is taken as a thermometric liquid.

Ans. i) It needs a very little heat to expand

ii) Its boiling point is 357°C and melting point is 39°C so it can record a wide range of temperature.

iii) It does not stick to the side of capillary tube.

iv) It is opaque and shining. So it can be seen clearly through the capillary tube.

6. write the upper standard point and lower standard point of Celsius scale, Kelvin scale and Fahrenheit scale.

Scales	Upper std. point.	lower std. point.
Celsius scale	100°C	0°C
Kelvin scale	373K	273K
Fahrenheit Scale	213°F	32°F

Define the following:

7. Thermal expansion: The expansion produced in matter due to absorption of heat

8. Linear expansion: The increase in length of a solid on heating

9. Superficial expansion: The increase in area of a substance on heating

10. Cubical expansion: The **increase in volume of a substance on heating**

11. What is bimetallic a strip?

Ans. The plates of two different metals which are riveted together at a number of points in such a way that they cannot slide on being heated or cooled form a bimetallic strip

12. Define conduction:

Ans. The process of transmission of heat energy in solid without the actual movement of particles from their position is called conduction

13. Define convection

Ans. The phenomenon due to which particles of medium actually move to the source of heat energy and an absorbing heat energy move away from it there by making space for other particles move to source of heat energy.

14. Define Radiation: The transfer of heat energy directly from a hot body to cold body without heating the space in between the two bodies.

15. What is thermal radiation/Radiant heat

Ans. The heat energy which is transferred from a hot body to a cold body without being absorbed by the space between hot and cold bodies is called as thermal radiation.

CHAPTER 6-SOUND

Unit1-SOUND, ITS PRODUCTION AND PROPAGATION

STUDY QUESTIONS

1-What causes the sound? Describe an experiment in support of your answer.

Ans- Sound is produced by a vibrating body. When we beat a drum, the membrane of the drum vibrates and sound is produced.

2 (a)-What are conditions for transmission of sound

Ans –For hearing sound following conditions are necessary.

- 1) There should be a vibrating body.
- 2) There should be a medium for propagation of sound.
- 3) There should be a receiver to receive the sound.

(b)-Describe sound as a longitudinal wave.

Ans- Sound travels as a longitudinal wave in which the particles of the medium vibrate in the direction of propagation of the sound wave.

3-Describe how the energy is carried to the ear, from the source of sound ,through a material medium.

Ans – When a body vibrates, it transfers its energy to the molecules of the medium which then start vibrating and transfer the energy from one point to another. In this way sound energy reaches our ear and make the eardrum vibrate. These vibrations in the eardrum are carried to the brain and we hear the sound.

4-Describe an experiment to prove that sound can transmit through

- a) Solids-When we press our ear on one end of a long steel bar and that is hammered from the other end, we hear two sounds
 - 1-The first sound is through the steel bar.
 - 2-The second sound is through air.This indicates that sound can travel through solids.
- b) Liquids-When we take a bell and ring it inside a bucket full of water, we hear the sound of the bell. This indicates that sound can travel through liquids.

5-Why can the sound not travel through vacuum? Describe an experiment in support of your answer.

Ans- Sound is a mechanical (longitudinal) wave .That is why it cannot travel through vacuum. In a bell jar's experiment the sound of bell is heard due to the

presence of air inside the jar. When air from the jar is sucked out, no sound is heard though the bell keeps ringing. This implies that sound cannot travel through vacuum.

6-If you are provided with a powerful cracker, a stop watch, a measuring tape and a friend to help you, explain how can you measure the approximate speed of sound.

Ans-My friend will be at a distance of 1000m from me with a stopwatch. I will fire the cracker and will ask my friend to record the time from seeing the cracker and hearing the sound. Then speed of sound can be calculated as

Speed=Distance/Time i.e. equal to 1000m

Time in seconds

UNIT 2-REFLECTION AND CHARACTERISTICS OF SOUND

STUDY QUESTIONS

1a- What is meant by amplitude?

Ans- The maximum displacement of a particle from its mean position.

b-Define frequency and its SI unit.

Ans- The number of vibrations produced in one second is called frequency. SI unit is hertz (Hz). If a particle completes one oscillation in one second its frequency is called one hertz.

c-Define time period and its SI unit

Ans-The time taken by particle to complete one vibration.SI unit is second.

2-Define the following terms:

a-Infrasonic sound-The sounds of frequency less than 20 Hz are called Infrasonic.

b-Audible sound-The sounds of frequency 20Hz to 20000Hz are called audible sound.

c-Ultrasonic sound-The sounds of frequency more than 20000Hz are called Ultrasonic sound.

3-Name the animals that use ultra-sonic sound. Explain for any one of the animals.

Ans- Bats, Dolphins and Dogs etc. Bats send ultrasonic waves from their body and receive the echo from the obstacles to know the direction of obstacles. According to them they change their directions and move safely without seeing.

4- Define loudness of sound. How does it depend on the amplitude of the sound?

Ans- Loudness is that characteristic of sound which can distinguish a loud sound from a faint sound. Loudness is directly proportional to the square of amplitude i.e. if amplitude increases 3 times then loudness increases 9 times.

5-Define pitch of sound. How does it depend on the frequency of sound?

Ans- Pitch is that characteristic of sound which can distinguish a shriller or sharp sound from a grave or flat sound. It is directly proportional to the frequency of sound i.e. more is the frequency more is the pitch.

6- State difference between loudness and pitch of the sound.

Ans-

Loudness	Pitch
(i)Loudness distinguishes between a loud sound and a faint.	Pitch distinguishes between a shrill and a flat sound.
(ii)It depends on amplitude.	It depends on frequency.
(iii)It does not change with change in frequency.	It changes by changing frequency.

7a- What is meant by quality of sound?

Ans- The property of sound by which two sounds of same loudness and pitch can be distinguished is called quality of sound.

b- On which factor does quality of sound depend? Explain briefly.

Ans- Quality depends on the wave form of sound. For example a piano and a guitar may produce a sound of same loudness and pitch. But differ in their wave form, hence differ in their quality

EXTRA QUESTIONS OF SOUND

1. What is longitudinal wave. Give one example

Ans. When the particles of a medium oscillate in same direction in which the wave is being propagated then the wave so formed is called as longitudinal wave

Ex: Sound wave produced in air

2. Write the conditions for hearing sound

Ans. i) There should be a vibrating body

ii) there should be a material medium through which these vibrations could travel

iii) there should be a receiver to receive and interpret sound

3. Define the following

- i) **Amplitude:** The maximum displacement of a vibrating body from its mean position
- ii) **Frequency:** The number of vibrations of the vibrating body in one second. Its SI unit is hertz (Hz)
- iii) **Time period:** Time taken by the vibrating body to complete one vibration. SI unit is second.

4. Relation between time period and frequency

Ans. If the frequency is f and time period are T then the relation is

$$f = 1/T \text{ or } T = 1/f$$

5. Define audible sound write its frequency

Ans. The sound which are sensitive to human ear are called as audible or sonic sound its frequency is 20Hz to 20000Hz (20KHz)

6. What is Infrasonic sound range

Ans. Sound of frequency less than 20Hz is called as infrasonic sound

7. What is Ultrasonic sound

Ans. Sound of frequency more than 20,000Hz (20KHz) is called as ultrasonic sound

8. Write any three applications of ultra sound.

Ans. i) Used in Ultrasonography in medical science

ii) used for homogenizing milk

iii) Used to detect flaw in metals and structures

9. What is Galton whistle?

Ans. Dogs can hear up to the frequency level of 40,000Hz. They can be specially trained to respond to an ultrasonic whistle known as Galton whistle.

10. What is reflection of sound?

Ans. Sound energy after striking on a hard surface bounces off in some other direction is known as reflection of sound.

11. Define Echo.

Ans. The repetition of sound which is reflected from a high-rise building or a hill after the original sound dies off.

12. What is SONAR?

Ans. It is known as Sound Navigation and Ranging. It is used to measure the depth of sea.

13. Define loudness. Name the factor on which it depends.

Ans. It is the characteristics of sound which distinguishes a feeble sound from a loud sound of same frequency.

Factors on which loudness of sound depends:

1. Amplitude- more the amplitude more is the loudness.

2. Surface area- more is the surface area more is the loudness.

3. Distance- more is the distance from the source of sound less is the loudness.

14) Define Pitch. Name the factors on which it depends.

Ans. It is the effect produced on the ear by the sound of some particular frequency.

Factors :

1. Pitch depends on frequency of vibrating body
2. Higher the frequency shriller is the sound and lower is the frequency flatter is the sound
3. Small length of vibrating air column produces high pitch sound and vice-versa
4. Pitch of sound increases with the decrease in thickness or length of vibrating wires .

15) Define Quality of sound

Ans. The property due to which two notes of the same loudness and same frequency produced by two different bodies can be distinguished.

ELECTRICITY,UNIT2

Q 1.a) Define electric charge and its unit.

Ans-The number of charges(free electrons)which drift from higher to lower potential is called quantity of charge.

The electric charge is measured in Columbus(C).The quantity of electric charge which will deposit 0.00118 g of silver on the cathode, when passed through silver nitrate solution is called one coulomb.

b) Define electric current and its unit.

Ans-The rate of flow of charge in an electric circuit is called electric current.

The unit of electric current is Ampere(A).When one coulomb charge flows through an electric circuit in one second, the current flowing through the circuit is said to be one ampere.

Q 2.What do you understand by resistance? State its unit also

Ans-The friction (or obstruction) offered to the passage of electric current by a material is called resistance of the material.

Its unit is ohm(Ω).

Q 4.a)Describe a simple electrical circuit in series combination with proper diagram.

Ans-A single bulb connected to a dry battery through a switch when the circuit is closed ,the bulb glows dimly. Two bulbs connected to a dry cell, such that the positive of the bulb is connected to the negative of the other bulb. When the circuit is closed the two bulbs glows dimly.

Q 4.b)Describe a simple electrical circuit in parallel combination with proper diagram.

Ans-Two bulbs connected to a cell through a switch, such that positive end of the cell is simultaneously connected to one point of the bulbs and the negative end of the cell is simultaneously connected to the other point of the bulb. Nowhere three bulbs glow with same brightness .If circuit is broken for a particular bulb, the other bulbs continue functioning independently.

Q 5.a)Define good and bad conductors with proper examples.

Ans-The materials which allows the electric current to flow through them are called good conductors silver, copper, aluminum.

Eg'

The materials which do not allow the electric current to flow through them are called bad conductors or insulators.

Eg: plastic, nylon ,wood

b)Describe how electric cell is considered as a source of electricity?

Ans- A cell is a small source of electric current. The cells are used to operate small devices like torches, transistors, radios, bicycle lamp, small type recorders, etc. Button cell(very small cells)are used for operating calculators, wrist watches etc. These cells are called primary cells. They cannot be recharged.

In addition to these cells, there are storage cells. These are used in cars, trucks, tractors, motorcycle etc.to provide electric current for head lights and in the operation of engine. The storage cells are called secondary cells.They can be recharged.

EXTRA QUESTIONS ONElectricity

1)Define one coulomb (or) unit of charge

Ans. The quantity of electric charge which will deposit 0.008g of silver on cathode when passed through silver nitrate solution is called one coulomb.

2)What is the magnitude of charge an electron

Ans. Charge on an electron $1.6 \times 10^{-19}C$

3) Define resistance write its SI Unit .

Ans. The obstruction offered to the flow of electric current by a material is called as resistance. Its SI Unit is ohm.

4) Define one ohm.

Ans. It is obstruction offered by a conductor when a current of 1 ampere flows through it such that the potential difference is one volt across the ends.

5) Define one ampere.

Ans. When one coulomb charge flows through an electric circuit in one second then the current flowing through the circuit is said to be one ampere.

