

SELECTION

8

TERM-II

SCIENCE

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SELECTION

EIGHTH STANDARD

8

TERM - II

SCIENCE

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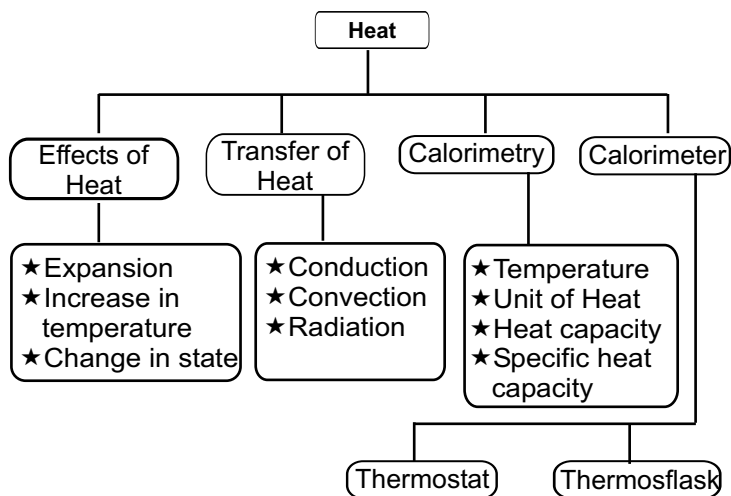
SELECTION 8 SCIENCE

TERM - II

PHYSICS

UNIT - 1 HEAT

MIND MAP



TEXT BOOK EXERCISES

I. Choose the best answer.

1. Heat is a form of _____.

- a) electrical energy
- c) thermal energy

- b) gravitational energy
- d) None of these

Ans : c) thermal energy

2. If you apply some heat energy to a substance, which of the following can take place in it?

- a) Expansion b) Increase in temperature
c) All the above. d) All the above.

Ans : d) All the above.

3. Which of the following substances will absorb more heat energy?

- a) Solid b) Liquid
c) Gas d) All the above

Ans : a) Solid

4. If you apply equal amount of heat to a solid, liquid and gas individually, which of the following will have more expansion?

- a) Solid b) Liquid
c) Gas d) All of them

Ans : c) Gas

5. The process of converting a liquid into a solid is called _____.

- a) sublimation b) condensation
c) freezing d) deposition

Ans : c) freezing

6. Conduction is the heat transfer which takes place in a _____.

- a) solid b) liquid
c) gas d) All of them

Ans : a) solid

II. Fill in the blanks.

1. A calorimeter is a device used to measure the _____.

Ans : heat capacity of a substance

2. _____ is defined as the amount of heat required to raise the temperature of 1 kg of a substance by 1°C.

Ans : specific heat capacity

3. A thermostat is a device which maintains _____.

Ans : the temperature of an object constant

4. The process of converting a substance from gas to solid is called _____. **Ans : deposition**

5. If you apply heat energy, the temperature of a system will _____. **Ans : increase**

6. If the temperature of a liquid in a container is decreased, then the interatomic distance will _____. **Ans : decrease**

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

1. The applied heat energy can be realized as an increase in the average kinetic energy of the molecules.

2. The dimensions of a substance are increased if the temperature of the substance is decreased.

Ans : False. correct statement: The dimensions of a substance are decreased if the temperature of the substance is decreased.

3. The process of converting a substance from solid to gas is called condensation.

Ans : False. correct statement: The process of converting a substance from solid to gas is called sublimation.

4. Convection is the process by which the thermal energy flows in solids.

Ans : False. correct statement: Convection is the process by which the thermal energy flows in liquids and gases.

5. The amount of heat gained by a substance is equal to the product of its mass and latent heat.

Ans : False. correct statement: The amount of heat gained by a substance is equal to the product of its mass and heat capacity of a substance

6. In a thermos flask, the silvered walls reflect and radiate the heat to the outside.

Ans : False. correct statement: In a thermos flask, the silvered walls reflect and radiate the heat back to the liquid in the bottle.

IV. Match the following:

1. Conduction	a) Liquid
2. Convection	b) Gas to liquid
3. Radiation	c) Solid to gas
4. Sublimation	d) Gas
5. Condensation	e) Solid

Ans :

1. Conduction	e) Solid
2. Convection	a) Liquid
3. Radiation	d) Gas
4. Sublimation	c) Solid to gas
5. Condensation	b) Gas to liquid

V. Read the directions given below and answer the questions.

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

1. Assertion: Radiation is a form of heat transfer which takes place only in vacuum.

Reason: The thermal energy is transferred from one part of a substance to another part without the actual movement of the atoms or molecules.

Ans : b) If both assertion and reason are true, but reason is not the correct explanation of the assertion.

2. Assertion: A system can be converted from one state to another state.

Reason: It takes place when the temperature of the system is constant.

Ans : c) If the assertion is true, but the reason is false.

VI. Answer briefly.

1. What are the applications of conduction in our daily life?

Ans : Conduction in daily life :

- ★ We cook food in vessels made up of metals. When the vessel is heated, heat is transferred from the metal to the food.
 - ★ When we iron dresses heat is transferred from the iron to the cloth.
-

2. What are the effects of heat?

Ans :

- ★ Expansion
 - ★ Increase in temperature
 - ★ Change in state
-

3. Name three types of heat transfer.

Ans : Three types of heat transfer are :

- ★ Conduction
 - ★ Convection
 - ★ Radiation
-

4. What is conduction?

Ans : The process of heat transfer in solids from a region of higher temperature to a region of lower temperature by the movement of molecules is called conduction.

5. Write a note on convection.

Ans : The form of heat transfer from places of high temperature to places of low temperature by the actual movement of liquid or gas molecules is called convection.

6. Define specific heat capacity.

Ans : The amount of heat energy required to raise the temperature of 1 kilogram of a substance by 1°C or 1K is called specific heat capacity of a substance.

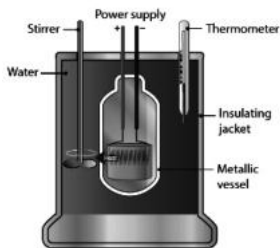
7. Define one calorie.

Ans: One calorie is the amount of heat energy required to raise the temperature of 1 gram of water through 1°C .

$$1 \text{ calorie} = 4.186 \text{ J.}$$

VII. Answer in detail.**1. With the help of a neat diagram explain the working of a calorimeter.**

Ans : A calorimeter is a device used to measure the amount of heat gained or lost by a substance. It consists of a vessel made up of metals like copper or aluminium which are good conductors of heat and electricity. The metallic vessel is kept in an insulating jacket to prevent heat loss to the environment. There are two holes in it. Through one hole a thermometer is inserted to measure the temperature of the contents. A stirrer is inserted through another hole for stirring the content in the vessel. The vessel is filled with liquid which is heated by passing current through the heating element. Using this device we can measure the heat capacity of the liquid in the container.



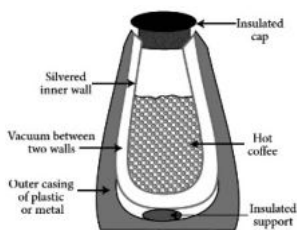
calorimeter

2. Write a note on thermostat.**Thermostat:**

Ans : A thermostat is a device which maintains the temperature of an object constant. The word thermostat is derived from two Greek words, 'thermo' meaning heat and 'static' meaning staying the same. Thermostats are used in any device or system that gets heated or cools down to a pre-set temperature. It turns an appliance or a circuit on or off when a particular temperature is reached. Examples for thermostat include building heater, central heater in a room, air conditioner, water heater, as well as kitchen equipments including oven and refrigerators. Sometimes, a thermostat functions both as the sensor and the controller of a thermal system.

3. Explain the working of thermos flask.**Ans : Working of thermos flask :**

A thermos flask has double walls, which are evacuated. It is silvered on the inside. The vacuum between the two walls prevents heat being transferred from the inside to the outside by conduction and convection. With very little air between the walls, there is almost no transfer of heat from the inner wall to the outer wall or vice versa. Conduction can only occur at the points where the two walls meet, at the top of the bottle and through an insulated support at the bottom. The silvered walls reflect radiated heat back to the liquid in the bottle.

**Thermos flask****VIII. HOT Questions.****1. Why does the bottom of a lake not freeze in severe winter even when the surface is all frozen?**

Ans : When a lake freezes, the upper layer freezes due to being in contact with the cold atmosphere. This ice sheet doesn't sink as it is less dense than water. This ice sheet acts like an insulator and keeps the water inside warm enough to be in a liquid form. The water on the surface of a lake is frozen.

2. Which one of the following statements about thermal conductivity is correct? Give reason.

- a) Steel > Wood > Water b) Steel > Water > Wood
 d) Water > Wood > Steel

Ans: c) Water > Steel > Wood

Reason :

- ★ Liquid conducts heat faster than solid. So water conducts heat more than steel.
- ★ Wood is a bad conductor of heat.
- ★ Steel is a good conductor of heat
- ★ So, steel conducts heat more than wood.

IX. Problems.

1. An iron ball requires 1000 J of heat to raise its temperature by 20°C. Calculate the heat capacity of the ball.

Ans : Given :

Heat energy, $Q = 1000 \text{ J}$

Raise in temperature, $\Delta T = 20^\circ\text{C} = 20 \text{ K}$

Heat capacity, $C' = ?$

$$C' = Q / \Delta T$$

$$1000 \text{ J}$$

$$C' = \frac{\quad}{\quad}$$

$$20 \text{ K}$$

Heat capacity $C' = 50 \text{ JK}^{-1}$

2. The heat capacity of the vessel of mass 100 kg is 8000 J/°C. Find its specific heat capacity.

Ans : Given : Mass, $m = 100 \text{ kg}$

Heat capacity, $C' = 8000 \text{ J/}^\circ\text{C} = 8000 \text{ J/K}$

Q

Specific heat capacity, $C = \frac{\quad}{\quad}$

$m \times \Delta T$

Q

Heat capacity, $C' = \frac{\quad}{\Delta T}$

ΔT

$$\text{Specific heat capacity } C = \frac{C'}{m} = \frac{8000 \text{ J/K}}{100 \text{ kg}}$$

$$= 80 \text{ J/K/Kg} = 80 \text{ JK}^{-1}\text{Kg}^{-1}$$

Specific Heat capacity, $C = 80 \text{ JK}^{-1}\text{Kg}^{-1}$

Additional Questions and Answers.**I. Choose the best answer :****1. Heat expansion is maximum in**

b) liquids

c) gases

d) plasma

Ans : c) gases**2. is a bad conductor or insulator.**

a) Steel

b) Sodium

c) Silver

d) Wood

Ans : d) wood**3. Heat can be transferred through empty space even through a vacuum by**

a) conduction

b) radiation

c) convection

d) convection

Ans : b) radiation**4. The unit of energy in SI system is**

a) Kelvin

b) Celcius

c) Joule

d) Fahrenheit

Ans : c) Joule**5. The relation between calorie and joule is given as 1calorie =J**

a) 4.798

b) 7.498

c) 4.896

d) 4.186

Ans : d) 4.186**6. The SI unit of heat capacity is**

a) JK

b) JK^{-1}

c) JKg

d) JKg^{-1} **Ans : b) JK^{-1}** **7. The vacuum flask was invented by**

a) Kelvin

b) James Dewar

c) Celcius

d) Joule

Ans : b) James Dewar**8. measures the heat capacity of water.**

a) Calorimeter

b) Thermos flask

c) Thermostat

d) Calorimetry

Ans : a) Calorimeter**II. Fill in the blanks.****1. is the process of heat transfer in solids.****Ans : Conduction****2. are good conductors of heat****Ans : Metals****3. Heat energy from the sun reaches the earth by****Ans : radiation****4. is a physical quantity which expresses whether an object is hot or cold.****Ans : Temperature****5. The most commonly used unit of heat is****Ans : calorie****6. The SI unit of specific heat capacity is****Ans : $\text{JKg}^{-1}\text{K}^{-1}$**

7. The world's first ice - calorie meter was used by
and

Ans : Antoine Lavoisier, Pierre Simon Laplace

the heat is transferred asthe heat is transferred as

Ans : electro magnetic waves

III. State True or False. if false correct the statement :

1. Water is the only matter on the earth that can be found naturally in all three states - solid, liquid and gas.

Ans : True

2. Conduction takes place in liquids and gases

Ans : False. correct statement: Convection takes place in liquids and gases

3. A Thermostat is a device used to measure the amount of heat gained or lost by a substance.

Ans : False. correct statement: A Calorie meter is a device used to measure the amount of heat gained or lost by a substance. 4. A Calorie meter is a device which maintains the temperature of a place or an object.

Ans : False. correct statement: A Thermostat is a device which maintains the temperature of a place or an object.

5. A Thermostat functions both as the sensor and the controller of a thermal system

Ans : True

IV. Match the following.

(i) sublimation	gas to solid
(ii) condensation	liquid to solid
(iii) freezing	gas to liquid
(iv) deposition	solid to gas

Ans :

(i) sublimation	solid to gas
(ii) condensation	gas to liquid
(iii) freezing	liquid to solid
(iv) deposition	gas to solid

V. Short questions and answers:

1. You would have noticed some space being left in railway tracks. Why?

Ans : It is because railway tracks which are made up of iron metal expand during summer. When there is a gap, there will not be any damage in the track due to expansion of the metal rod.

2. What are the applications of convection in daily life?**Ans : Convection in daily life :**

- ★ Formation of land breeze and sea breeze is due to
 - ★ Wind flows from one region to another region by convection.
-

3. What are the applications of radiation in daily life?**Ans : Radiation in daily life :**

- ★ Heat energy from the Sun reaches the Earth by radiation.
 - ★ While standing near fire we feel the heat which is transferred as radiation.
-

4. What is Calorimetry?

Ans : Calorimetry is the technique used to measure the amount of heat involved in a physical or a chemical process.

5. Define heat capacity.

Ans : Heat capacity is the amount of heat energy required to raise the temperature of a substance by 1°C or 1K .

Activity : 1

Take a metal ball and a metal ring of suitable diameter. Pass the metal ball through that ring. You can observe that the metal ball can easily go through it. Now heat the metal ball and then try to pass it through the ring. It will not pass through the ring. Keep the metal ball on the ring for some time. In few minutes, it will fall through the ring.

Ans : When the ball is heated the atoms in the ball gain heat energy. They start vibrating and force each other apart. As a result an expansion takes place. That's why the ball did not go through the ring. After some time, as the ball lost the heat energy to the surrounding it came back to its original size and it went through the ring. This shows that heat energy causes expansion in solids. This expansion takes place in liquids and gases also. It is maximum in gases.

Activity 2

Take a cup of water and note its temperature. Heat the water for few minutes and note the temperature again.

What is the change in the temperature? What caused the temperature change?

Ans : When the water is heated, water molecules receive heat energy. This supplied heat energy increases the kinetic energy of the molecules. When the molecules receive more energy, the temperature of the water increases. This shows that heat energy causes increase in temperature.

Activity 3

Take few ice cubes in a container and heat it for some time. What happens? The ice cubes melt and become water. Now heat the water for some time. What do you observe? The volume of water in the vessel decreases. What do you understand from this activity?

Ans : In ice cubes the force of attraction between the water molecules is more. So they are close together. When we heat them the force of attraction decreases and the ice cubes become water. When we heat the water, the force of attraction between the molecules decreases further. Hence they move away from one another and become vapour. Since water vapour escape to the surrounding, water level decreases further. From this we understand that heat energy causes change in the state of the substances. When heat energy is removed, changes take place in reverse direction.

Activity 4

Take hot water in a cup and put a silver spoon in it. Leave the spoon inside the water for some time. Now touch the end of the spoon. Do you feel the heat?

Ans : Yes, I feel the heat.

Activity 5

Take some water in a vessel and heat it on a stove. Touch the surface of the water. It will be cold. Touch it I be hot now. How did it will heat hot now. How did the heat which was supplied at the bottom reach the top?

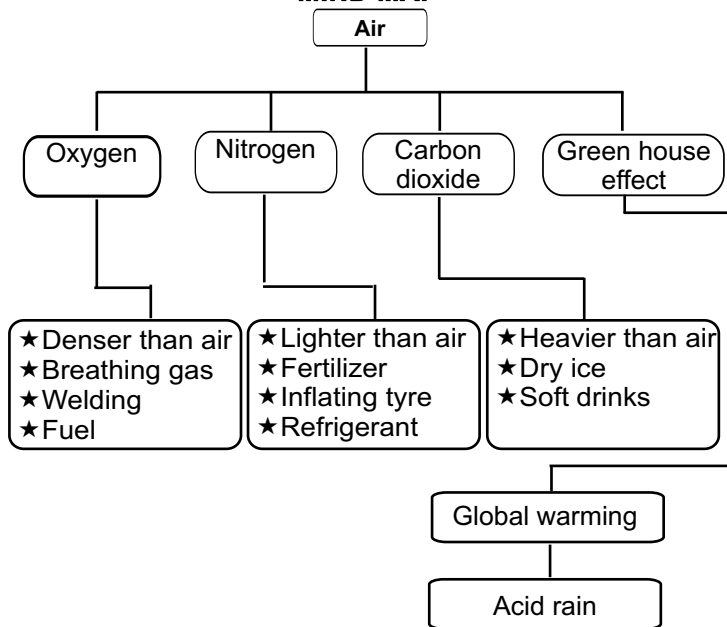
Ans : When water in the vessel is heated, water molecules at the bottom receive heat energy and move upward. Then the molecules at the top comes down and get heated. This kind of heat transfer is known as convection. This is how air in the atmosphere is also heated.

Activity 6

Take some amount of water and cooking oil in two separate vessels. Heat them till they reach a particular temperature (Caution: Heat the oil under the supervision of your teacher). Which one is heated first? Water will take more time to get heated. Why?

Ans :

- ★ Oil is heated first.
 - ★ Because the amount of heat energy gained by the substance is determined the heat capacity of a substance.
 - ★ Oil has more heat capacity than water.
-

CHEMISTRY**UNIT - 3. AIR****MIND MAP****TEXT BOOK EXERCISES****I. Choose the best answer.****1. Which of the following is true about oxygen?**

- a) Completely burning gas b) Partially burning gas
c) Doesn't support burning d) Supports burning

Ans : d) Supports burning

2. Aerated water contains

- a) air b) oxygen
c) carbon dioxide d) nitrogen

Ans : c) carbon dioxide

3. Solvay process is a method to manufacture

- a) lime water b) aerated water
c) distilled water d) sodium carbonate

Ans : d) sodium carbonate

4. Carbon dioxide with water changes

- a) blue litmus to red b) red litmus to blue
c) blue litmus to yellow d) doesn't react with litmus

Ans: a) blue litmus to red

5. Which of the following is known as azote?

- a) Oxygen b) Nitrogen
c) Sulphur d) Carbon dioxide

Ans : b) Nitrogen

II. Fill in the blanks.

1. _____ is called as vital life. **Ans : Oxygen**
2. Nitrogen is _____ than air. **Ans : lighter**
3. _____ is used as a fertilizer. **Ans : Nitrogen**
4. Dry ice is used as a _____. **Ans : refrigerant**
5. The process of conversion of iron into hydrated form of oxides is called _____. **Ans : rusting**

III. Match the following:

1. Nitrogen	Respiration in living animals
2. Oxygen	Fertilizer
3. Carbon dioxide	Refrigerator
4. Dry ice	Fire extinguisher

Ans :

1. Nitrogen	Fertilizer
2. Oxygen	Respiration in living animals
3. Carbon dioxide	Fire extinguisher
4. Dry ice	Refrigerator

IV. Answer briefly.**1. What are the sources of oxygen?**

Ans : Sources of Oxygen :

- | | | |
|---|------------------------|----------------------------|
| (i) Atmospheric air | } Oxygen in free state | } Oxygen in combined state |
| (ii) water | | |
| (iii) plants and animals | | |
| (iv) Minerals in the form of silicates, carbonates and oxides | | |

2. Mention the physical properties of oxygen.**Ans : Physical properties of oxygen :**

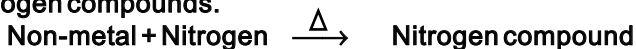
- ★ Oxygen is a colourless, odourless and tasteless gas.
- of heat and electricity
- ★ Oxygen dissolves readily in cold water
- ★ It supports combustion.

3. List out the uses of nitrogen.**Ans : Uses of nitrogen :**

- ★ Liquid nitrogen is used as a refrigerant.
- ★ It provides an inert atmosphere for conducting certain chemical reactions.
- ★ It is used for inflating tyres of vehicles.

4. Write about the reaction of nitrogen with non metals.**Ans : Reaction of nitrogen with non metals**

Nitrogen reacts with non-metals like hydrogen, oxygen etc., at high temperature to form their corresponding nitrogen compounds.

**Example :****5. What is global warming?**

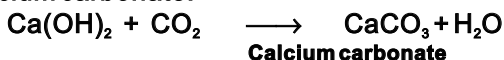
Ans : Global warming refers to an average increase in the temperature of the atmosphere or simply it is the warming of the earth.

6. What is dry ice? What are its uses?

- Ans :** (i) Solid carbon dioxide is called dry ice
(ii) Dry ice is used as a refrigerant.

V. Answer in detail.**1. What happens when carbon dioxide is passed through lime water? Write the equation for this reaction.**

Ans : When a limited amount of CO_2 is passed through lime water, it turns milky due to the formation of insoluble calcium carbonate.



When an excess amount of CO_2 is passed through lime water, it first turns milky and the milkyness disappears due to the formation of soluble calcium hydrogen carbonate, $\text{Ca(HCO}_3)_2$.

2. Name the compounds produced when the following substances burn in oxygen.

- a) Carbon b) Sulphur c) Phosphorous
 e) Iron f) Sodium

Ans :

Substances burn in oxygen	Compounds produced
a) Carbon	Carbon dioxide (CO ₂)
b) Sulphur	Sulphur dioxide(SO ₂)
c) Phosphorous	Phosphorous trioxide (P ₂ O ₃) or Phosphorous pentoxide (P ₂ O ₅)
d) Magnesium	Magnesium oxide (MgO)
e) Iron	Iron oxide (Fe ₃ O ₄)
f) Sodium	Sodium oxide (Na ₂ O)

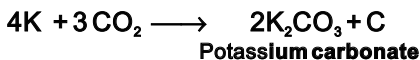
3. How does carbon dioxide react with the following?

- a) Potassium b) Lime water c) Sodium hydroxide

Ans :

a) Potassium :

When carbon dioxide react with potassium it gives potassium carbonate.



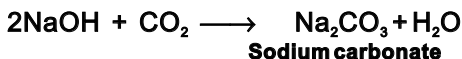
b) Lime water :

When a limited amount of CO₂ is passed through lime water, it turns milky due to the formation of insoluble calcium carbonate.



c) Sodium hydroxide

Sodium hydroxide is neutralized by carbon dioxide to form sodium carbonate and water



4. What are the effects of acid rain? How can we prevent them?**Ans : Effects of Acid rain :**

kin of human beings.

- ★ It inhibits germination and growth of **seedlings**.
- ★ It changes the fertility of the soil, destroys plants and aquatic life.
- ★ It causes corrosion of many buildings, **bridges, etc.**

Preventive measures :

Acid rain and its effects can be controlled by the following ways.

- ★ Minimizing the usage of fossil fuel such as petrol, diesel etc.,
 - ★ Using CNG (Compressed Natural Gas).
 - ★ Using non-conventional source of energy.
 - ★ Proper disposal of the industrial wastes.
-

VI. Higher Order Thinking Questions.**1. Soda bottle bursts sometimes when it is opened during summer. Why?**

Ans : Because the gas in the soda bottle expands during summer. So the pressure inside the bottle increases. Due to high pressure soda bottle bursts sometimes when it is opened during summer.

2. It is said that sleeping beneath the tree during night is bad for health. What is the reason?

Ans : The tree leaves carbon dioxide at night. So if we sleep under the tree at night, we will not get oxygen, which can cause breathing problem, suffocation.

3. Why does the fish die when it is taken out of water?

Ans : When fishes are taken out of water the supply of oxygen to the fishes will be stopped. Fishes cannot absorb and breathe using oxygen present in the atmosphere. So the fishes die when it is taken out of water.

4. How do astronauts breathe when they go beyond earth's atmosphere?

Ans : Astronauts breathe air almost identical to the stuff we breathe down here on planet Earth that is same pressure and about 80% nitrogen and 20% oxygen. It turns out water into hydrogen and oxygen by electricity

Additional Questions and Answers.**I. Choose the best answer :**

1. gas is called as 'fire air'

b) Nitrogen

c) Hydrogen d) Helium **Ans : a) Oxygen**

2. is the third most abundant element on earth.

a) Hydrogen b) Helium

c) Oxygen d) Carbon **Ans : c) Oxygen**

3. is used as a substitute for compressed air in tires.

a) Hydrogen b) Nitrogen

c) Oxygen d) Helium **Ans : b) Nitrogen**

4. can be used in the preservation of food grains & fruits

a) CO_2 b) O_2

c) H_2 d) He **Ans : a) CO_2**

5. is used as a fire extinguisher

a) Carbon dioxide b) Carbon monoxide

c) Nitrogen dioxide d) Nitric oxide

Ans : a) Carbon dioxide

II. Fill in the blanks.

1. is used as oxy - acetylene for cutting and welding metals. **Ans : Oxygen**

2. The greek word 'azote' means.....

Ans : no life

3. Many explosives such as TNT, nitroglycerin and gun powder contains..... **Ans : nitrogen**

4. Venus atmosphere consists of roughly 96-97%

Ans : carbon dioxide

5. CFC means.....

Ans : chloro fluoro carbon

III. Match the following :

(i) Nitrogen	Green house gas
(ii) Oxygen	Irritates skin and eyes
(iii) Carbon dioxide	Acid producers
(iv) Acid rain	Incandescent Bulb

Ans :

(i) Nitrogen	Incandescent Bulb
(ii) Oxygen	Acid producers
(iii) Carbon dioxide	Green house gas
(iv) Acid rain	Irritates skin and eyes

IV. Short answers.**1. Write the uses of oxygen?****Ans : Uses of oxygen**

ethylene light for cutting and welding metals. and welding

★ It is used to remove carbon impurities from steel

2. What is nitrogen fixation?

Ans : Any process that converts nitrogen in the air into a useful nitrogen compound is called the nitrogen fixation.

3. Define sublimation.

Ans : The process of conversion of solid into vapour without reaching liquid state is called sublimation.

4. What are the preventive measures need to take to save the earth from Global warming ?**Ans :**

- ★ Reduction in the use of fossil fuels.
 - ★ Controlling deforestation.
 - ★ Restricting the use of CFCs.
 - ★ Planting more trees.
 - ★ Reducing, reusing and recycling resources.
-

5. What is green house effect?**Ans :**

The gaseous molecules which absorb the infra red rays are called green house gases and this effect is called green house effect.

(Ex.) CO_2 , N_2O , CH_4 , CFC are the green house gases

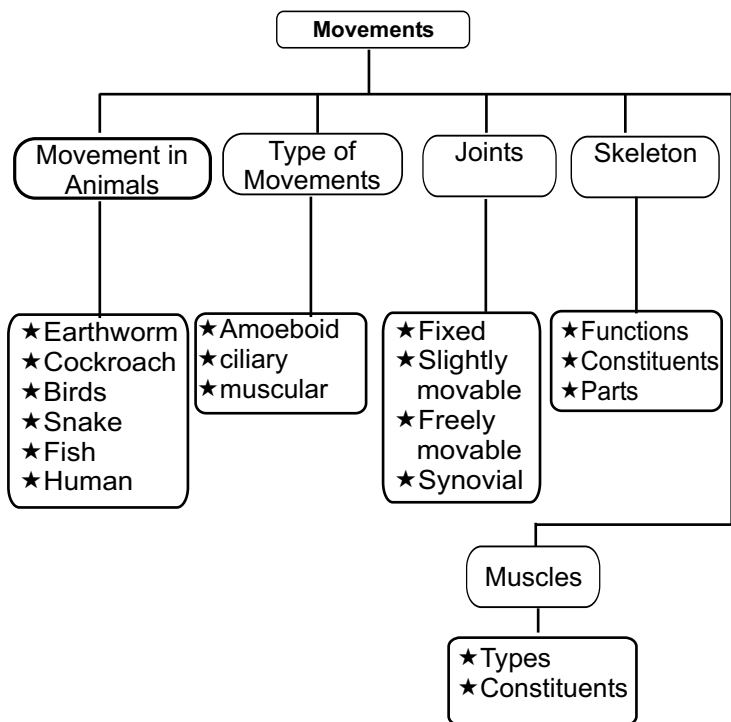
Activity : 1

Heat a strip of magnesium ribbon in the flame till it catches fire and introduce it into the jar containing a dazzling bright light and white ash of magnesium oxide is formed.

Activity 2

Heat a small piece of phosphorous and introduce it into the oxygen jar. Phosphorous burns with suffocating smell and gives phosphorous pentaoxide (white fumes).



BIOLOGY**UNIT - 5. MOVEMENTS****MIND MAP****TEXT BOOK EXERCISES**

I. Choose the best answer.

1. Which of the following parts of our body help us in movement?

(i) Bones (ii) Skin (iii) Muscles (iv) Organs

Choose the correct answer from the option below.

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

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

Ans : (a) (i) and (iii)

2. Which one of the following organisms lack muscles and skeleton for movement?

- (a) Dog (b) Snail
(c) Human being (d) Human being

Ans : (b) Snail

3. _____ joints are immovable.

- (a) Shoulder and arm (b) Knee and joint
(c) Upper jaw and skull (d) Lower jaw and upper jaw

Ans : (c) Upper jaw and skull

4. Why do underwater divers wear fin-like flippers on their feet ?

- (a) To swim easily in water.
(b) To look like a fish.
(c) To walk on water surface.
(d) To walk over the bottom of the sea (sea bed).

Ans : (a) To swim easily in water.

5 External ear (pinna) is supported by

- (a) bone (b) cartilage
(c) tendon (d) capsule

Ans : (b) cartilage

6. Cockroach moves with the help of its

- (a) leg (b) bone
(c) muscular foot (d) whole body

Ans : (a) leg

7. Which one of the following categories of vertebrae are correctly numbered.

- (a) Cervical-7 (b) Thoracic-10
(c) Lumbar-4 (d) Sacral-4

Ans : (a) Cervical-7

II. Fill in the blanks.

1. Movement of organism from place to place is called _____.

Ans : Locomotion

2. _____ refers to change in position of the part of an organisms body.

Ans : Movement

3. A structure which provides rigid frame work to the body is called _____.

Ans : Skeleton

4. Axil skeleton in human consists of _____, _____, _____ and _____.

Ans : Skull, Ribs, Sternum and vertebral column

5. Appendicular skeleton in human consists of _____ and _____. **Ans : Pectoral girdle And pelvic girdle**

6. The place where two bones meet is termed as _____. **Ans : Joint**

7. _____ is attached to soft parts of the body like blood vessels, iris, bronchi and the skin

Ans : Antagonistic muscles

8. _____ muscle makes pupil of eyes wider.

Ans : Radial

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

1. Skull in humans consists of 22 bones.

Ans : True

2. There are 12 pairs of ribs in human body.

Ans : True

3. Pelvic girdle is a part of axial skeleton.

Ans : False. Correct statement : Pelvic girdle is a part of appendicular skeleton.

4. Hinge joint is slightly movable joint.

Ans : False. Correct statement : Hinge joint is freely movable joint.

5. Cardiac muscle is a voluntary muscle.

Ans : False. Correct statement : Cardiac muscle is a involuntary muscle.

6. The flexor and extensor muscle of the arm are antagonistic muscles.

Ans : True

IV. Answer very briefly.

1. What is skeleton?

Ans : Skeleton is the hard structure or framework to the human body which supports and protects the body.

2. What is cranium?

Ans : Cranium:

- ★ Cranium or skull box is formed of 8 bones.
 - ★ They have immovable joints
 - ★ It forms the hard structure of skull.
-

3. Why our backbone is slightly movable?

Ans : ★ Backbone or vertebral column runs from the base of the skull to the hip bone forming a tube.

It is held together by gliding joints which allow the body to be bent back, front or sideways.

4. Differentiate axial and appendicular skeleton.

Ans :

S.No.	Axial skeleton	Appendicular skeleton
1.	Axial skeleton consists of the bones along the axis or central line, of the human body	Appendicular skeleton contains the bones in the appendages of the body
2.	There are 80 bones	There are 126 bones.

5. What is ligament?

Ans : Ligaments are short bands of tough fibrous connective tissues that function to connect one bone to another.

6. Define Muscle.

Ans : ★ Muscles are long bundles of contractile tissue.

★ Muscles in the body provide the means of all movements.

7. Differentiate tendons and ligament.

Ans :

S.No.	Tendons	Ligament
1.	Tendons are made of elastic tissue	Ligaments are short bands of tough fibrous connective tissues
2.	Connect bones to muscle	Connect bone to bone.

V. Answer briefly.**1. Differentiate between the following.****a) Movement and Locomotion.**

Ans :

S.No.	Movement	Locomotion
1.	Act of changing the place or position by one or more parts of the body	The movement of an organism from one place to another
2.	Voluntary or involuntary	Voluntary
3.	Requires energy	Doesn't require energy

b) Endoskeleton and Exoskeleton**Ans :**

S.No.	Endoskeleton	Exoskeleton
1.	Found inside the body	Found on the exterior layer of the body
2.	Originates from the mesoderm.	Originates from embryonic ectoderm or mesoderm.
3.	From the main body structure.	Protects and preserves the inner organs.

c) Pectoral and Pelvic girdle**Ans :**

S.No.	Pectoral girdle	Pelvic girdle
1.	Pectoral girdle is formed by collar bone at the front and shoulder blade at the back	Pelvic girdle is formed by five fused vertebrae at the back and form a cavity in the centre.
2.	Attachment of arms	Attachment of legs.
3.	Comprises arm, wrist and hand bones.	Comprises leg, ankle and foot bones.

d) Ball and socket Joint and Hinge Joint**Ans :**

S.No.	Ball and socket joint	Hinge joint
1.	A ball shaped head of one bone articulates with a cup like socket of an adjacent bone.	A cylindric protrusion of one bone articulates with a trough shaped depression of an adjacent bone
2.	Examples. Shoulder, Hip	Examples : Elbow, knee, ankle.

e) Voluntary and Involuntary muscle**Ans :**

S.No.	Voluntary muscle	Involuntary muscle
1.	Voluntary muscles are multi nucleated unbranched and striated	Involuntary muscles are single, central nucleated, branched and non-striated
2.	Attached to bones, arms, legs, neck.	Attached to soft parts of the body like blood vessels, iris, bronchi and the skin.

2. What are antagonistic muscles? Give one example.**Ans :**

★ Muscles which work in pairs against each other are called antagonistic muscles.

Examples :

- ★ In the iris of the eye, there are two sets of muscles.
- ★ Radial muscles → Make the pupil of the eye wider.

3. How is the skeleton of a bird well-suited for flying?**Ans :** ★ Bones of birds are light and strong

- ★ They are hollow and have air spaces between them.
- ★ The hind limbs of birds are modified as claws, which help them to walk and to perch.
- ★ The breast bones are modified to hold massive flight muscles ; which help in moving wings up and down.
- ★ Forelimbs are modified into wings.

4. What are the functions of skeleton in human body?**Ans : Functions of skeleton :**

The skeletal system serves five important functions in the human body.

1. It provides structure and shape to the body.
2. It supports and surrounds the internal organs of the body.
3. Calcium and phosphorus, the two minerals that the body needs for important regulatory functions, are stored inside the bones.
4. Red blood cells are produced in the bone marrow.
5. The bones of the skeletal system act as levers for muscular action. Muscular movement would not be possible without **tendons** (fibrous cords of tissue that attach muscle to bone) and **ligaments** (fibrous cords of tissue that attach bone to bone).

VI Answer in detail.

1. Name the different types of joints? Give one example for each type.

Ans :

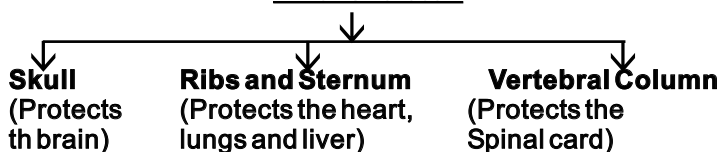
Types of joints	Examples
a) Fixed or Immovable joints	Bones of the skull
b) Slightly movable joints	Rib and the breast bone, vertebrae.
c) Freely movable joints : Types :	
1) Ball and socket joint	Shoulder, Hip.
2) Hinge joint	Elbow, Knee, Ankle.
3) Pivot joint	Spine, Atlas / Axis joint at the top
4) Condylod	Wrist
5) Gliding	Spine (between the bony processes of the vertebrae.)
6) Saddle	Thumb, Shoulder and inner ear

2. Write about the human axial skeleton, giving suitable labelled diagram.

Ans : Axial skeleton :

The axial skeleton consists of the bones along the axis or central line of the human body.

Axial skeleton



a) skull :

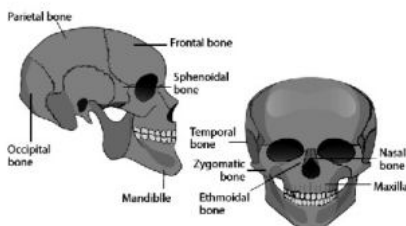
★Skull is a hard structure made up of small bones.

★It is formed of 22 bones. They are,

★Cranium - 8 bones

★Face - 14 bones

★Lower jaw is the only movable joint



skull bone in human

★ The movable joint is supported by muscles and ligaments.

e :

Rib cage :

★ Rib cage occupies the chest region.

★ It is a cone-shaped structure made up of 12 pairs of ribs.

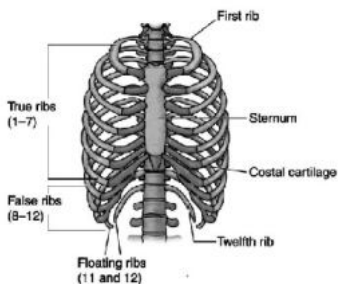
★ Ribs are attached to vertebrae at the back which curve around to form a cage.

★ 10 pairs of ribs are attached to the breast bone at the front.

★ 2 pairs of lower ribs are free at front. These are called as free-floating ribs.

★ Rib cage can contract and expand during the process of breathing.

★ Rib cage protects the underlying lungs, heart and some part of liver.



Rib cage in human

c) Vertebral Column :

★ Vertebral column running at the back of the body is also called as spine or the backbone.

★ It is in the trunk region to offer support to the upper part of the body.

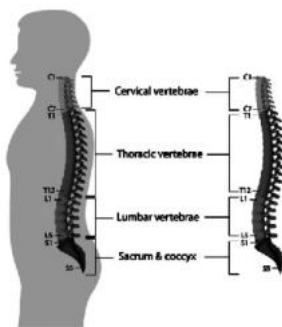
★ Vertebral column is made up of individual bones called as vertebrae.

★ Total vertebral column consists of 7 cervical vertebrae, 5 lumbar vertebrae, 5 fused sacral and 4 fused coccygeal vertebrae.

★ Vertebral column runs from the base of the skull to the hip bone forming a tube.

★ Spinal cord passes through this hollow tube.

★ Vertebrae are joined by gliding points which allow the body to be bent back, front or side wards.



3. Discuss various types of movements seen in living organisms.**Ans :**

★ It is brought about by pseudopodia which are appendages which move with movement of protoplasm within a cell.

Ciliary movement :

★ This movement is brought about by appendages called as cilia which are the hair-like extensions of the epithelium.

★ Both these kinds of movements are seen with cells of the lymphatic system.

Muscular movement :

★ It is a more complex movement which is brought about by the musculoskeletal system.

★ This type of movement is seen in the higher vertebrates.

Movements in Human body :

★ Humans can move some parts of their body in different directions

★ skeleton which helps in the movement of the body. ★

Some of the movements in body parts of human are:

(a) Movement of eyelids.

(b) Movement of the heart muscles.

(c) Movement of teeth and jaw.

(d) Movement of arms and legs.

(e) Movements of head.

(f) Movements of neck.

Movement in Snake :

★ Movement of snake is called *slithering movement*. ★

Many snakes can swim in water also.

4. What is a streamlined body? How does it help in the movement of animals that fly or swim in water?**Ans :**

means body which can offer minimum resistance to air and water by its particular type of body shape.

(ii) ★ Fish have streamlined body structure which helps them to move smoothly with the flow of water.

★ Muscles and fins on the body and the tail help to keep the balance.

★ Some birds can also swim in the water. A bird has streamlined body.

★ The body of a fish is streamlined to reduce friction while moving in water.

★ They have strong muscles, which help in swimming.

★ When a fish swims its front part curves to one side and the tail part stays in the opposite direction.

★ In the next move, the front part curves to the opposite side and the tail part also changes its position to another side.

★ The caudal or tail fin helps in changing direction.

5. Write a short note on different types of muscles.**Ans : Types of muscles :**

Characteristics		Characteristics
Striated / Skeletal / Voluntary muscle	Attached to bones. Found in arms, legs, neck.	Multinucleate, Unbranched, Voluntary.
Non striated / Smooth / Involuntary	Attached to soft parts of the body like blood vessels, iris, bronchi and the skin.	Single, central nucleus Involuntary
Cardiac	Heart	Branched, 1-3 central nuclei Involuntary

Additional Questions and Answers.**I. Choose the best answer :****1.use their muscles and scales for walking.**

a) Earthworm b) Snakes

c) Cockroach d) Birds

Ans : b) Snakes**2. Flexion and extension movement it by..... joint**

a) Condylloid b) Pivot

c) Saddle d) Hinge

Ans : c) Saddle**3.bones are found in skull.**

a) Flat b) Irregular

c) Long d) Short

Ans : a) Flat**4. The hardest working muscle is in**

a) Liver b) Lungs

c) Stomach d) Eye

Ans : d) Eye**5. Muscles of skin are..... and**

a) Straited / Voluntary

b) Non-straited / Voluntary

c) Smooth / Involuntary

d) Branched / straited

Ans : c) Smooth / Involuntary

II. Fill in the blanks.

1. A..... can run faster than a man.

Ans : Hippopotamus

..... that can swim.....

Ans : Dolphin

3. Wrist is an example ofjoint

Ans : Conolyloid

4. Synovial joint is known as

Ans : diarthrosis joint

5. Knee cap is called as.....

Ans : Patella

III. Say True or False. If false correct its statements.

1. A movement takes place at the organism level.

Ans : False. Correct statement : A movement takes place at the **biological** level.

2. Chitin is shed regularly so that the body can grow.

Ans : True

3. Movement of Snake is called forward movement.

Ans : False. Correct statement : Movement of Snake is called **slithering** movement.

4. Articulating surfaces of gliding joint are flat and of a similar size.

Ans : True

IV. Answer the following.

1. Explain the two types of flight in birds.

Ans :

Birds show two types of flight: gliding and flapping.

Gliding: ★ During gliding the bird has its wings and tail spread out.

★ In this movement the bird uses air currents for going up and down.

Flapping: ★ This is an active flight. The bird beats the air by flapping its wings.

★ They use flight feathers for this purpose.

2. Mention the thrusts involved in forward movement.

Ans :

★ Sideway thrust

★ Resultant thrust

★ Backward thrust

3. What are arthritis?

Ans : Arthritis is a disease, caused due to the deposition of uric acid crystals in the joints.

4. What are the different types of bones found in human skeletal system ?

Ans :

Long Bones: in arms and legs.

Short Bones: Found in wrist ankle, vertebral column.

Flat Bones: Found in skull, ribs, shoulder and hips.

Irregular Bones: Found in spine and vertebral column, mandible, palatine, inferior, nasal concha and hyoid

Answer in Detail.

1. Tabulate the features, structure and function of Synovial joint.

Feature	Structure	Function
Ligament	A band of strong fibrous tissue.	To connect bone to bone.
Synovial fluid	A slippery fluid with the consistency of egg-whites that is contained within the joint cavity.	To reduce friction between the articular cartilage in the joint.
Articular cartilage	Glassy-smooth cartilage that is spongy and covers the ends of the bones in the joint.	To absorb shock and to prevent friction between the ends of the bones in the joint.
Joint Capsule	A tough fibrous tissue that has two layers, with the fibrous capsule lying outside the synovial membrane.	The fibrous capsule helps to strengthen the joint, while the synovial membrane lines the joint and secretes synovial fluid.

2. List out the functions of vertebral column.**Ans : The functions of vertebral column:**

- ★ It protects the spinal cord.
 - ★ head.
 - ★ It serves as an attachment for the ribs.
 - ★ It provides support and place of attachment for the pectoral and pelvic girdle.
 - ★ It provides movement for the human skeleton.
 - ★ It helps in walking and standing erect with correct posture.
-

Activity : 1

Observe an earthworm moving on soil in the garden. Gently lift it and place it on a piece of blotting or filter paper. Observe its movement now. In which of the above two surfaces do you find that the earthworm is able to move easily?

Ans :

- ★ On filter paper earthworm moves easily.
 - ★ On blotting paper it cannot move easily because of smooth surface.
-

Activity 2

Observe a Cockroach and identify its legs and wings. Try to know more about other parts of Cockroach with the help of your teacher.

Ans: Parts of Cockroach :

- ★ Three pairs of jointed legs, helps to walk, run and climb.
 - ★ Two pairs of wings for flying.
 - ★ Large and strong muscles help in the movement of legs.
 - ★ The body is covered by chitin, a light protective material.
 - ★ Chitin is shed regularly so that the body can grow.
-

Activity 3

Observe a hen and crow. How do they move?

Write about the similarity and dissimilarity in your note book.

Ans :**Hens :** ★ Hens move by wadding

- ★ Chickens can't as selective breeding has made them too heavy.
- ★ They walk and run everywhere.

Crow : ★ Crows migrate.

- ★ They fly to maintain balance among the group.
 - ★ Crows are always on the move.
-

Activity 4

Make a paper boat; put it in water and push it with narrow end pointing forward. Now hold the boat into water from the broad side. water from the broad side. What did you observe? In which process was it easy to move the boat? Have you noticed that the shape of a boat is somewhat like a fish?

Ans :

- ★ If the paper boat pushed from the broad side, it moves very slowly
 - ★ Paper boat pushed with narrow end pointing forward process was easy to move the boat
 - ★ Yes. I have noticed that the shape of a boat is somewhat like a fish.
-

Activity 5

Measure the size of your biceps and also ask your friends to do. Take turns lifting a water full of bottle as many times as you can. Record the number of lifts each student was able to do. Compare each pair's results with the rest of the class and determine whether those with larger bisceps were able to do more lifts.

(Classroom Activity)

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