# Grade 10 Science Maharashtra 2019

## PART - 1

General Instructions:

(i) All questions are compulsory.

(ii) Draw scientifically, technically correct labelled diagrams wherever necessary.

(iii) Start writing each main question on a new page.

(iv) Figures to the right indicate full marks.

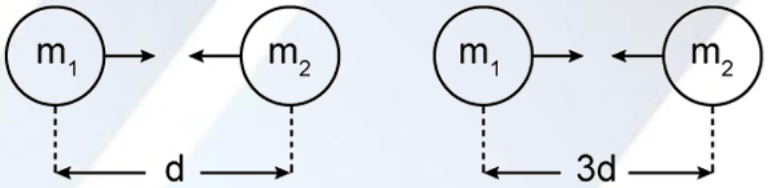
(v) For each MCQ (i.e. Q. No. 1-B) evaluation would be done for first attempt only.

(vi) For each MCQ, correct answer must be written along with its alphabet.

E.g.: (i) (a) ..... (ii) (b) ..... (iii) (c) .....

Q1. **(A) Answer the following questions:** **5**

1. Write the proper answer in the box




If $F = Gm_1 m_2/d^2$, then F =_____

**Solution:**

$F = Gm_1 m_2/9\ d^2$

As shown in the second figure, the distance is **3d**. Substituting this value into the formula:

$F = Gm_1\ m_2/(3\ d)^2 = G\ m_1\ m_2/9\ d^2$

2. In Dobereiner's triads Li, Na, K the atomic masses of Lithium and Potassium are 6.9 and 39.1, respectively. What will be the atomic mass of sodium?

**Solution:**

According to Dobereiner's Triads, the atomic mass of sodium (Na) is the average of the atomic masses of lithium (Li) and potassium (K). This can be calculated as: (6.9 + 39.1) ÷ 2 = 23. This shows that sodium's atomic mass falls between the atomic masses of lithium and potassium.

3. State whether the given statement is true or false:
   A concave lens is a converging lens.

**Solution:**

The statement is false. Because a lens that brings refracted rays together at a single point is called a converging lens. In contrast, a concave lens spreads out the refracted light, making it a diverging lens.

4. By considering first correlation, complete the second correlation:

Hubble telescope: 569 km high from earth surface
Revolving orbit of Hubble telescope: _____

**Solution:**

Revolving orbit of Hubble telescope: Low Earth Orbit

5. If the height of the satellite orbit above the earth's surface is in between 180 km and 2000 km, the orbits are called Low Earth Orbits. Hence, the revolving orbit of Hubble telescope is Low Earth Orbit.
   Find the odd man out:

Tinning, Anodization, Alloying, Froth floatation

**Solution:**

The odd one is Froth floatation. Tinning, anodization, and alloying are methods used to coat a thin layer of metal onto another metal's surface. In contrast, froth flotation is a technique that separates hydrophobic substances from hydrophilic ones and is commonly used in mineral processing, paper recycling, and wastewater treatment.

**(B) Choose the correct alternative:** **5**

1. The reaction of iron nail with copper sulphate solution is ___ reaction.

(A) Combination

(B) Decomposition

(C) Displacement

(D) Double displacement

**Solution:**

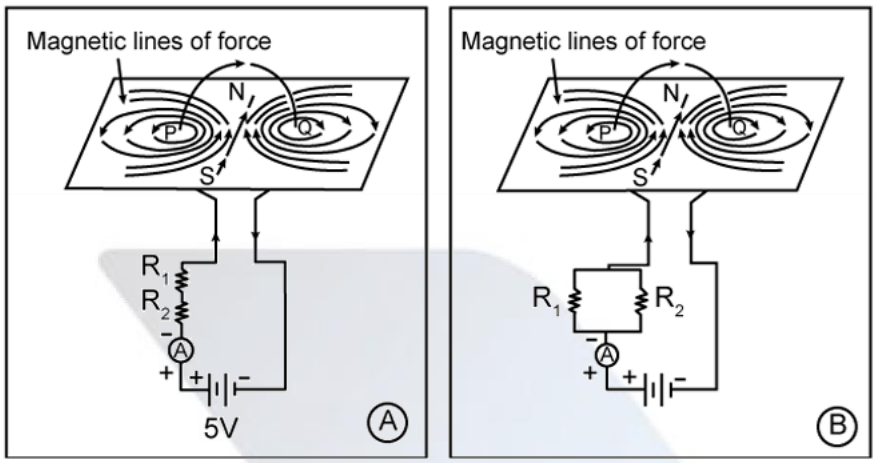
(C) Displacement

Iron is more reactive than copper, so it can replace copper in its compounds, like copper sulfate solution. This displacement reaction changes the blue color of copper sulfate to the light green color of iron sulfate.

Given below is the reaction:

$Fe + CuSO_4$ (aqueous) $\rightarrow FeSO_4 + Cu$

2. Observe the following diagram and choose the correct alternative:




(A) The intensity of magnetic field in $A$ is larger than in $B$.

(B) The intensity of magnetic field in $B$ is less than in $A$.

(C) The intensity of magnetic field in $A$ and $B$ is the same.

(D) The intensity of magnetic field in $A$ is less than in $B$.

**Solution:**

(D) The intensity of a magnetic field in $A$ is less than in $B$. In other words, the magnetic field is weaker in A compared to B. This means that B has a stronger magnetic force than A.

3. A ray of light makes an angle of 50° with the surface $S_1$ of the glass slab. Its angle of incidence will be _____.

(A) 50°

(B) 40°

(C) 140°

(D) 0°

**Solution:**

(B) 40°

The second law of reflection states that the angle of incidence (i) is equal to the angle of reflection (r). We also know that the sum of angles on a straight line is 180°.

In this case:

$50° + i + r + 50° = 180°$

Since the angle of incidence equals the angle of reflection (i = r), we can rewrite the equation as:

$100° + i + i = 180°$

This simplifies to:

$2i = 180° - 100°$

$2i = 80°$

Now, divide both sides by 2:

$i = 80° \div 2$

$i = 40°$

Therefore, the angle of incidence is 40°. This means the light hits the surface at a 40° angle, and it reflects at the same angle.

4. Water expands on reducing its temperature below _____ °C.

(A) 0
(B) 4
(C) 8
(D) 12

**Solution:**

(B) 4°C

At **4°C**, liquid water has the smallest volume under normal atmospheric pressure. When the temperature drops below this, water expands because its molecules arrange themselves in a way that reduces energy in their interactions.

5. The carbon compound used in daily life is _____.

(A) Edible oil

(B) Salt

(C) Carbon dioxide

(D) Baking soda

**Solution:**

(A) Edible oil

Edible oil is a carbon-based compound that contains unsaturated hydrocarbons. While baking soda and carbon dioxide also contain carbon, they are not as commonly used as edible oils. Therefore, the correct answer is edible oils.

**2. Attempt any five of the following questions: 10**

1. Two tungsten bulbs of power 50 W and 60 W work on 220 V potential difference. If they are connected in parallel, how much current will flow in the main conductor?

**Solution:**

Given: If $P_1$ is $= 50$ W

$P_2$ is $= 60$ W and

V is $= 220$ V, then

To Find I $= ?$

Formula P = VI

Then Solution would be:

$=$ Total Power $(P) = P_1 + P_2 = 50 + 60 = 110$ W

So, if P $=$ VI

$I = P/V = 110/220 = 0.5$ A.

2. Give scientific reason:

In the electric equipment producing heat e.g. iron, electric heater, boiler, toaster etc., an alloy such as Nichrome is used, not pure metals.

**Solution:**

Nichrome is an alloy with high resistivity, which makes it heat up quickly even with a small current. Electrical devices like irons, heaters, boilers, and toasters work using the heating effect of electric current. Because of this property, nichrome is commonly used in these heat-producing appliances.

3. A metal ball of mass 5 kg falls from a height of 490 m . How much time will it take to reach the ground? ( g $=$ 9.8 m/s2 ).

**Solution:**

10 Seconds

$u$ is the Initial velocity of the metal ball $= 0$

$s$ is the displacement travelled by the metal ball $=$ 490 m

We know that $s = ut + 1/2at^2$

Replacing the values you get $490 = 0 \times t + 1/2 \times g \times t^2$

( g is acceleration due to gravity)

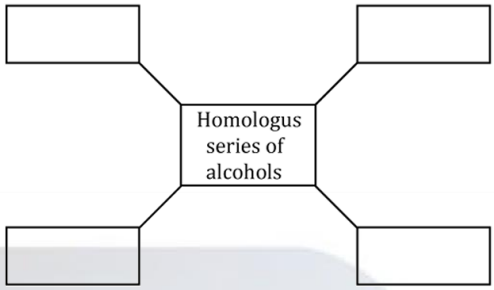
Hence, $490 = 0 \times t + 1/2 \times 9.8$xt$^2$

$490 = 0 + 4.9 \times t^2 = 4.9t^2$

t$^2$ $= 490/4.9 = 100$

So, t=10.

4. Write names of first four homologous series of alcohols:




**Solution:**

The first four homologous series of alcohols are known as:

- Methanol series ($CH_3OH$)
- Ethanol series ($C_2H_5OH$)
- Propanol series ($C_3H_7OH$)
- Butanol series ( $C_4H_9OH$ )

The common formula for alcohols in a homologous series is $C_nH_{(2n+1)}OH$. You can find specific alcohols by substituting different numbers for "n." This helps identify various alcohols like methanol, ethanol, and propanol.

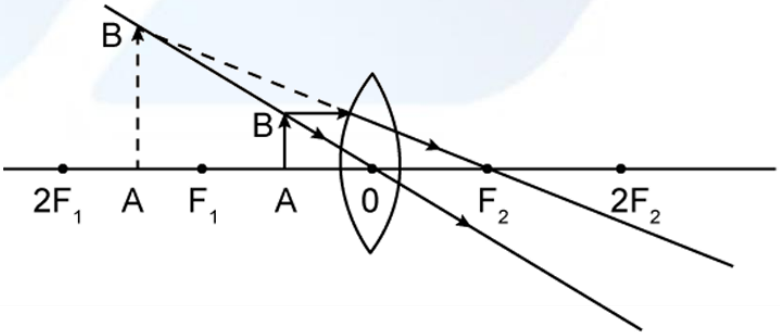
$n = 1$, Methanol ($CH_3OH$)

$n = 2$,Ethanol ($C_2H_5OH$)

$n = 3$, Propanol ($C_3H_7OH$)

n=4, Butanol ($C_4H_9OH$).

5. Observe the following figure and complete the table:



| | Points | Answers |
|---|---|---|
| (i) | Position of the object | |
| (ii) | Position of the image | |
| (iii) | Size of the image | |
| (iv) | Nature of the image | |

**Solution:**

| | Points | Answers |
|---|---|---|
| (i) | Position of the object | Between F1 and O |
| (ii) | Position of the image | On the same side of the lens as the object |
| (iii) | Size of the image | Very large |
| (iv) | Nature of the image | Virtual and erect |

6. Out of sodium and sulphur, which is a metal? Explain its reaction with the oxygen.

**Solution:**

Sodium is a metal, while sulfur is a non-metal. When sulfur burns in air, it reacts with oxygen to produce sulfur dioxide, an acidic oxide. In contrast, sodium reacts with oxygen even at room temperature, forming sodium oxide.

$4Na + O_2 \rightarrow 2Na_2O$

Sodium + Oxygen → Sodium Oxide

7. A tapping vessel opens in a tank like container that is tapering on the lower side. The tank has an outlet for water on the upper side and a water inlet on the lower side. Finely ground ore is released in the tank. A forceful jet of water is introduced in the tank from lower side and gangue particles and pure ore are separated by this method.

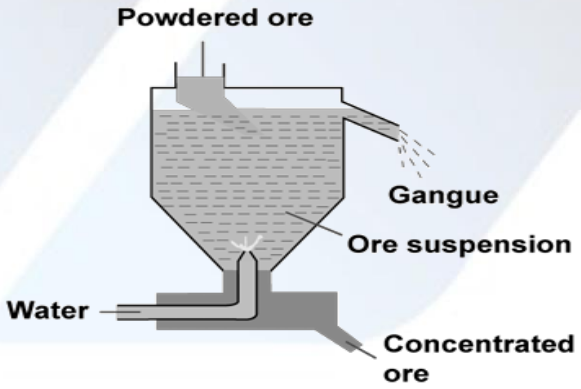
i. The above description is of which gravitation separation method?

ii. Draw labelled diagram of this method.

**Solution:**

(i) Hydraulic Separation Method

(ii)




Hydraulic separation

**3. Attempt any five of the following questions: 15**

1. What would be the value of ' $g$ ' on the surface of the earth if its mass was twice and its radius half of what it is now?

**Solution:**

The formula is given $g = GM/R^2$

In this g is the acceleration due to gravity

M for mass of the earth

R is radius of the earth

G for universal gravitational constant

Now, according to the question

Mass is twice $= 2M$

Radius is half= $R/2$

g 1 is considered as the new gravity.

When we substitute the formula we get

$g1 = G \times 2M/(R/2)^2$

$g1 = 2GM/R^2/4$

$= 8(GM/R^2)$

$= 8 \times g = 8(9.8) = 78.4\ m/s^2$.

2. Write the merits of Mendeleev's periodic table.

**Solution:**

Mendeleev's periodic table demonstrates the following merits:

1. Mendeleev organized the 63 elements known at that time.

2. The atomic masses of some elements were adjusted to fit them correctly in the periodic table based on their properties.

3. He left empty spaces in the periodic table for elements that had not yet been discovered. Three of these unknown elements were named eka-boron, eka-aluminium,

and eka-silicon, with estimated atomic masses of 44, 68, and 72, respectively. Their properties were also predicted.

4. Although noble gases were not included in Mendeleev's original table, their discovery in the late 19th century led him to introduce the 'zero' group, ensuring they fit into the periodic table without altering its structure.

3. Study the following chemical reaction and answer the questions given below:

$$AgNO_{3(aqq)} + NaCl_{(aq)} \longrightarrow \underset{\text{(Precipitate)}}{AgCl_{(s}\downarrow} + NaNO_{3(aq)}$$

i. Identify and write the type of chemical reaction.

ii. Write the definition of the above type of chemical reaction.

iii. Write the names of reactants and products of the above reaction.

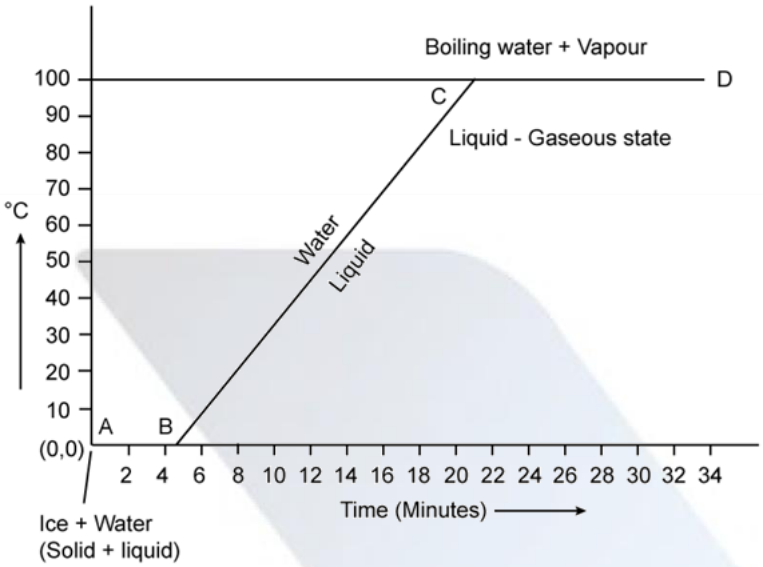
**Solution:**

(i) This is a double replacement reaction.

(ii) It usually happens in aqueous solutions, where ions from the reactants swap places to create a precipitate. Such reactions are known as double displacement reactions.

(iii) Silver Nitrate and Sodium Chloride are the substances involved in this reaction.

4. Explain the following temperature vs. time graph:




**Solution:**

The graph shows the changes that occur when a mixture of ice and water is heated. The line AB represents the melting of ice into water at a constant temperature of 0°C. This is known as the melting point of ice. As heating continues, the temperature rises from 0°C to 100°C along line BC. At 100°C, water begins to turn into steam, which is the boiling point of water. Beyond this point, the temperature remains constant, even with continued heating, as shown by line CD.

5. Surabhi from Std. *X* uses spectacles. The power of the lenses in her spectacles is 0.5 D.

Answer the following questions from the given information:

i. Identify the type of lenses used in her spectacles.

ii. Identify the defect of vision Surabhi is suffering from.

iii. Find the focal length of the lenses used in her spectacles.

**Solution:**

(i) Since the power is positive, the lenses in Surabhi's spectacles are convex lenses.

(ii) Surabhi has hypermetropia, also called long-sightedness. This common condition causes difficulty in seeing nearby objects clearly, while distant objects remain in focus.

(iii) Power of the lens ( $P$ ) =1/Focal length ( $F$ )

Given that Power $= 0.5$D

$0.5 = 1/Focal$ length

Focal length $= 1/0.5 = 10/5$

Hence, Focal length is 2 m.

6. Complete the following table:

| Sr. No. | Common Name | Structural Formula | IUPAC Name |
|---|---|---|---|
| 1. | Ethylene | $CH_2 = CH_2$ | _____ |
| 2. | _____ | CH 3 COOH | Ethanoic Acid |
| 3. | Methyl alcohol | _____ | Methanol |

**Solution:**

| Sr. No. | Common Name | Structural Formula | IUPAC Name |
|---|---|---|---|
| 1. | Ethylene | $CH_2 = CH_2$ | Ethene |
| 2. | Acetic Acid | $CH_3COOH$ | Ethanoic Acid |
| 3. | Methyl alcohol | $CH_3OH$ | Methanol |

7. What is meant by space debris? Why is there a need to manage the debris?

**Solution:**

Along with artificial satellites, there are other objects orbiting the Earth. These include inactive satellites, parts of rocket launchers that were detached during launch, and debris from collisions between satellites or other objects in space. As of a 2016 estimate, around 20 million pieces of debris longer than 1 cm are orbiting Earth. This debris poses a risk to

artificial satellites and spacecraft, as it could collide with and damage them. The amount of space debris is growing, and soon it may become challenging to launch new spacecraft. Therefore, managing space debris is crucial.

**Q.4. Answer anyone of the following questions: 5**

1. Taking into consideration the period of the elements given below, answer the following questions:

| Elements | Atomic Radius (pm) |
|---|---|
| O | 66 |
| B | 88 |
| C | 77 |
| N | 74 |
| Be | 111 |
| Li | 152 |

i. Arrange the above elements in a decreasing order of their atomic radii.

ii. State the period to which the above elements belong.

iii. Why is this arrangement of elements similar to the above period of modern periodic table?

iv. Which of the above elements have the biggest and the smallest atom?

v. What is the periodic trend observed in the variation of atomic radius while going from left to right, within a period?

**Solution:**

(i) According to the decreasing order of atomic radii:

Li > Be > B > C > N > O.

(ii) The given elements belong to Period 2.

(iii) As you move from left to right across a period, the atomic radius decreases. This happens because, as the atomic number increases, the positive charge in the nucleus also increases. However, the extra electrons are added to the same outer shell. The stronger nuclear charge pulls the electrons closer to the nucleus, which causes the atom's size to shrink.

(iv) Among these elements, Lithium has the largest atom, while Oxygen has the smallest atom.

(v) The atomic radius decreases as you move from left to right across a period.

2. The observations made by Swarali while doing the experiment are given below. Based on these, write answers to the questions:

Swarali found that the light ray travelling from the denser medium to rarer medium goes away from the normal. If the angle of incidence (i) is raised by Swarali, the angle of refraction (r) went on increasing. However, after certain value of the angle of incidence the light ray is seen to return into the denser medium. Questions:

i. What is the specific value of $i$ called?

ii. What is the process of reflection of incident ray into denser medium called?

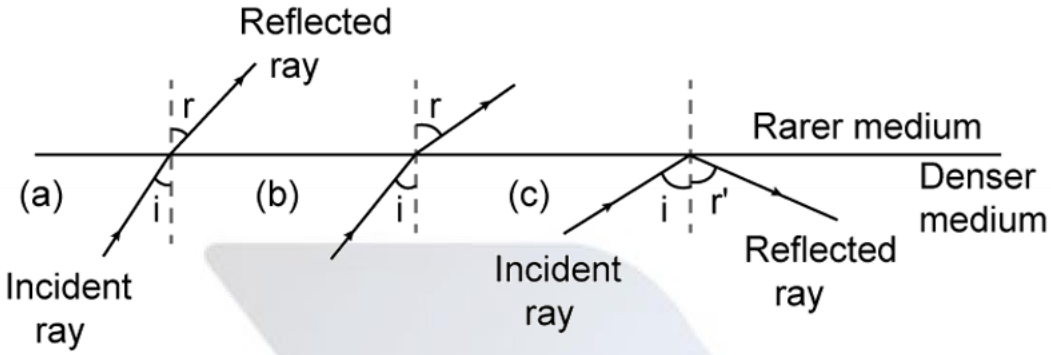
iii. Draw the diagrams of three observations made by Swarali.

**Solution:**

(i) The exact value of angle $i$ is known as the critical angle. It is the angle at which light, when passing from a denser to a rarer medium, refracts along the boundary between the two materials.

(ii) Total internal reflection is the process where an incident ray is reflected back into a denser medium.

(iii)


Reflected ray
r
r
Rarer medium
(a)
i
(b)
i
(c)
i
r'
Denser medium
Incident ray
Incident ray
Reflected ray

## PART - 2

General Instructions:

(i) All questions are compulsory.

(ii) Draw scientifically, technically correct labelled diagrams wherever necessary.

(iii) Start writing each main question on a new page.

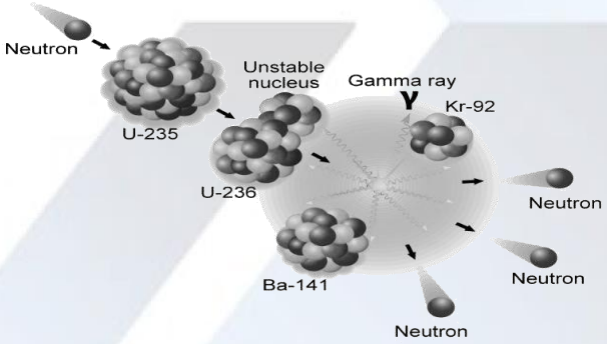
(iv) Figures to the right indicate full marks.

(v) For each MCQ (i.e. Q. No. 1-B) evaluation would be done for first attempt only.

(vi) For each MCQ, correct answer must be written along with its alphabet.

**1. (A) Solve the following questions:** **5**

(i) Identify the process shown in the figure and name it.




(ii) Pranav and Pritee are twins in your class. They belong to …….. twins' type.

(iii) There is an oil layer on the water surface of a river in your area. What will you do?

(iv) Fill in the boxes with the help of the given clues:

Continuous consumption of alcohol and tobacco material ……

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| A | | | | | | | O | |

(v) Find out the correlation: 1

White revolution: Increase in dairy production :: Green revolution : ……..

**Solution:**

(i) The process shown is nuclear fission or a chain reaction.

(ii) Pranav and Pritee are twins in the class and belong to the dizygotic (fraternal) twin type.

(iii) If an oil layer forms on a river's surface, we can use hydrocarbonoclastic bacteria like Pseudomonas to clean the spill.

(iv) Continuous consumption of alcohol and tobacco material **addiction**.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| A | **D** | **D** | **I** | **C** | **T** | **I** | O | **N** |

(v) White revolution : Increase in dairy production :: Green revolution : Increase in agriculture production or crop yield.

**(B) Choose the correct alternative and rewrite the statements:** **5**

(i) Somatic and stem cells undergo …….. type of division.

(a) meiosis

(b) mitosis

(c) budding

(d) cloning

**Solution:**

(b) mitosis

Somatic cells and stem cells divide through a process called mitosis. This type of cell division helps in growth, repair, and the replacement of old or damaged cells.

(ii) Which of the following is a man-made disaster?

(a) Earthquake

(b) Flood

(c) Meteoroid

(d) Leakage of toxic gases

**Solution:**

(d) Leakage of toxic gases

Leakage of toxic gases a human-caused disaster.

(iii) In a food chain, autotrophic plants are present at the …….. level.

(a) Tertiary nutrition

(b) Secondary nutrition

(c) Producer

(d) Apex

**Solution:**

(c) In a food chain, plants that make their own food, known as autotrophs, are found at the producer level. They use sunlight, water, and carbon dioxide to produce energy through photosynthesis, which supports all other living things in the chain.

(iv) …….. is a cold-blooded animal.

(a) Bat

(b) Snake

(c) Rabbit

(d) Elephant

**Solution:**

(b) Snake is a cold-blooded animal.

(v) …….. is a connecting link between annelida and arthropoda.

(a) Duck-billed platypus

(b) Peripatus

(c) Lungfish

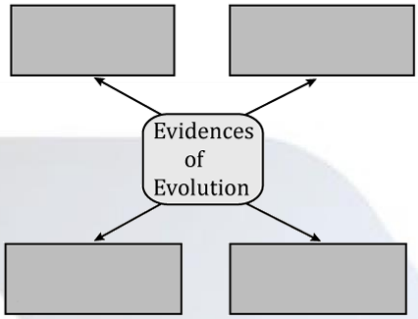
(d) Whale

**Solution:**

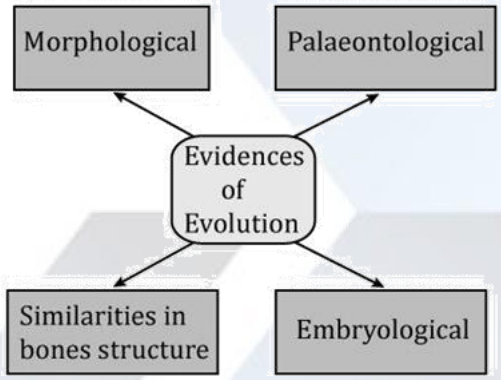
(b) Peripatus serves as a link between annelids and arthropods, showing features of both groups. It has characteristics similar to annelids, like a soft, segmented body, and traits of arthropods, such as jointed legs. This makes it an important organism for studying the evolutionary connection between these two groups.

**Q2. Solve any five of the following questions: 10**

(i) Complete the following chart:




**Solution:**

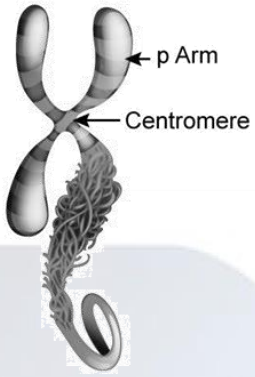



(ii) Draw a neat diagram of the structure of chromosome and label the parts:

(a) Centromere

(b) p-arm

**Solution:**




(ii) What are the advantages of hydroelectric power generation?

**Solution:**

Advantages of hydroelectric power generation are:

- Hydroelectric power generation does not cause pollution because no fuel is burned.
- If the dam has enough stored water, electricity can be produced whenever needed.
- The water reservoir used for power generation gets refilled during the rainy season, ensuring continuous electricity supply.

(iii) State any four benefits of animal classification.

**Solution:**

Benefits of classifying animals include:

- By learning about a few animals from a group, we can gain knowledge about the whole group.
- It helps in correctly identifying animals, which makes studying them simpler.
- Classification gives us an understanding of how animals have evolved and adapted over time.
- It helps us learn about where animals live and how they fit into the natural world.
- It also shows how animals are connected to other living things.

Additionally, animal classification helps organize information in a clear way, making it easier for scientists to share and compare their research.

(iv) State any four objectives of disaster management.

**Solution:**

The objectives of disaster management include:

- Saving lives by moving people to safer places away from disaster-affected areas.
- Supplying essential items like food, water, and medical aid to reduce the hardship caused by the disaster.
- Assisting in bringing life back to normal in areas affected by the disaster.
- Helping people who have lost their homes or been displaced to settle down again.
- Taking steps in advance to reduce the damage and risks of future disasters.

Disaster management also focuses on quick response and effective recovery to minimize losses and support affected communities.

(v) Give scientific reason:

Microbial enzymes are used instead of a chemical catalyst in a chemical industry.

**Solution:**

Microbial enzymes are used instead of a chemical catalyst in a chemical industry because:

- Microbial enzymes work efficiently at low temperature, pH, and pressure.
- This helps save energy and removes the need for erosion-resistant equipment.
- They prevent waste buildup and decomposition.
- Since enzymes perform specific tasks, unwanted byproducts do not form.
- Purification costs are reduced.
- These enzymes are environmentally friendly and can be reused.

(vii) Read the following extract and answer the questions that follow:

A liberal view behind the concept of organ and body donation is that after death our body should be useful to other needful persons so that their miserable life would become comfortable. Awareness about these concepts is increasing in our country and people are voluntarily donating their bodies.

Life of many people can be saved by organ and body donation. Blinds can regain their vision. Life of many people can be rendered comfortable by donation of organs like

liver, kidneys, heart, heart valves, skin etc. Similarly, body can be made available for research in medical studies. Many government and social organisations are working towards increasing the awareness about body donation.

(a) What is the liberal view behind organ and body donation?

(b) Name any four organs that can be donated.

**Solution:**

(a) A person who needs an organ transplant can receive one to improve their quality of life.

(b) Organs such as the kidneys, heart, eyes, liver, and skin can be donated.

**6. Solve the following questions (any five): 15**

(i) Answer the following questions:

(a) What do you mean by central dogma?

(b) What is transcription?

(c)What is meant by triplet codon?

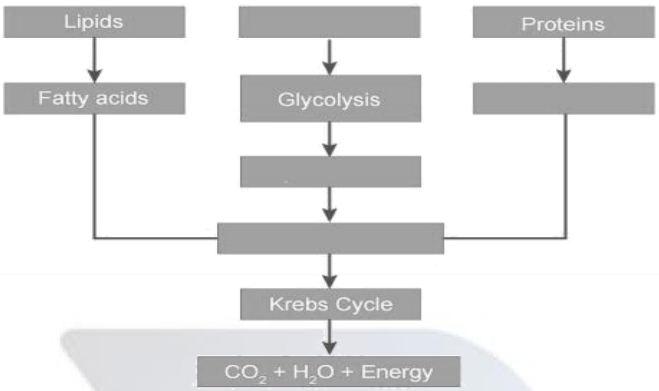
**Solution:**

(a) The process in which DNA makes proteins through RNA is known as the central dogma.

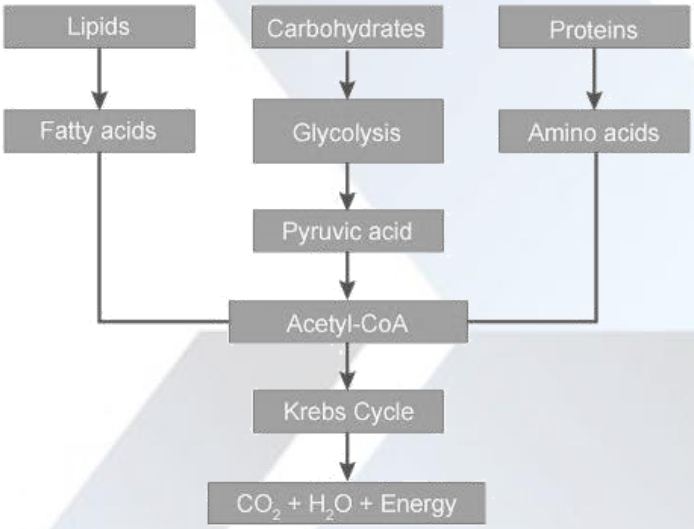
(b) The creation of RNA that matches the DNA strand is called transcription.

(c) Each amino acid is represented by a group of three nucleotides, known as a "triplet codon."

(ii) Complete the following chart and state which process of energy production it represents:




**Solution:**




(iii) (a) Playing games on the mobile while eating is right or wrong? Justify.

(b) What do your conclude from the following picture?

(c) Observe the following picture and state what can be the outcome?

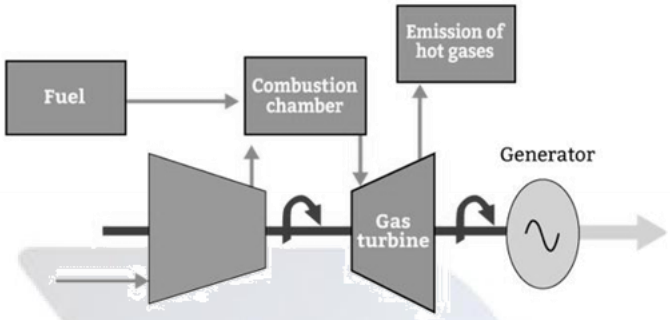
**Solution:**

(a) It is not right to play games on your mobile while eating. We should show respect for our food and eat in a proper manner.

(b) Avoid harmful addictions like smoking, drugs, and alcohol. The image sends a message about controlling such habits.

(c) Taking a selfie in the middle of the road can lead to an accident.

(iv) Observe the diagram and answer the questions:




(a) Which energy is generated from the power plant?

(b) State its source.

(c)Which is more eco-friendly – Power generation from coal or power generation from natural gas? Why?

**Solution:**

(a) Electricity is produced at a power plant.

(b) Energy is produced using natural gas.

(c) Generating power from natural gas is more environmentally friendly because burning it doesn't release sulfur dioxide, which causes pollution. Natural gas also has a higher efficiency in power generation.

(v) Identify my class/phylum and give one example of it:

(a) I have mammary glands and exoskeleton in the form of hair.

(b) We form the highest number of animals on the planet. We have bilateral symmetry and our exoskeleton is in the form of chitin.

(c) I live in your small intestine, my body is long and thread-like and pseudocoelomate.

**Solution:**

(a) **Class: Mammals**

Examples: Cat, dog, human

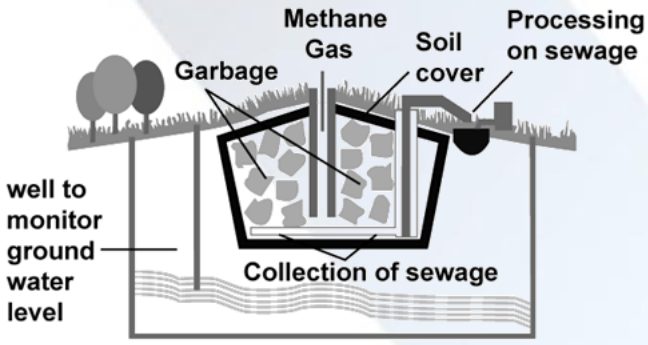
(b) **Phylum: Arthropods**

Examples: Prawn, crab

(c) **Phylum: Aschelminthes**

Examples: Filarial worm, Ascaris

(vi) Observe the following figure and answer the questions:




Modern landfill site

(a) Identify the process shown in the figure.

(b) Explain the process in short.

**Solution:**

(a) The process shown is a modern landfill site.

(b) **Modern landfill site:** Biodegradable waste from cities is managed by placing it in large, plastic-lined pits dug in open areas away from homes. The waste is compressed, covered with soil, sawdust, plant matter, and biochemicals, and sometimes mixed using bioreactors. Microorganisms break down the waste, and once the pit is full, it's sealed with soil slurry. After a few days, nutrient-rich compost is ready, and the site can be reused.

(vii) (a) What is biotechnology?

(b) Explain any two commercial applications of it.

**Solution:**

(a) Biotechnology is a technology that makes artificial genetic changes and hybridization in organisms for the benefit of humans.

(b) Commercial uses of biotechnology:

Crop biotechnology: It is applied in agriculture to enhance crop yield and variety. Research is focused on genetically modified crops, hybrid seeds, and plants that can tolerate herbicides.

Biofertilizers: Using biofertilizers instead of chemical ones helps improve plants' ability to fix nitrogen and dissolve phosphate, benefiting plant growth.

**7. Solve any one of the following questions:** **5**

(i) (a) Identify the following symbols and state their significance: 2

(b) How can biodiversity be conserved? 3

**Solution:**

(i) (a) The symbol conveys the message "Save Water" and the symbol encourages "Using a Bicycle," which is an eco-friendly and non-polluting mode of transport.

(b) Biodiversity can be preserved through:

- Protecting rare species
- Declaring certain areas as 'bioreserves'

- Setting up national parks and sanctuaries
- Conserving all plants and animals
- Following relevant laws and regulations
- Undertaking conservation projects for endangered species
- Keeping a record of traditional knowledge.

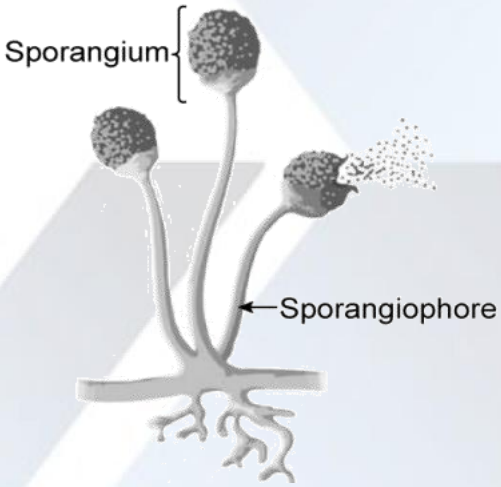
(ii) Answer the following questions:

(a) 'Gender of a child is determined by the male partner of a couple'.

Draw a diagram explaining the above statement. 2

(b) Prepare a slogan for the campaign against female foeticide. 1

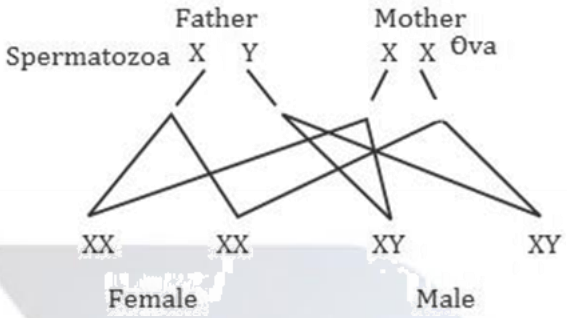
(c) In the following figure, explain how new fungal colonies of mucor are formed. 1




(d) Identify and state the type of reproduction represented in the above figure. 1

**Solution:**

(a) Diagram:




The diagram shows that males produce two types of sperm: one carrying an X chromosome and the other a Y chromosome. The mother only has eggs with X chromosomes. The sex of a baby is decided by the sperm that joins with the egg. If the sperm carries an X chromosome, the baby will be a girl. If it carries a Y chromosome, the baby will be a boy. The mother always provides an X chromosome, while the father's sperm decides the gender.

(b) "Save Her Life, Save the Future – Stop Female Foeticide!"

(c) Mucor has a body made of filaments and produces sporangia. When the spores are ready, the sporangia burst open and release them. The spores grow into new fungal colonies in warm, moist environments.

(d) It is a type of reproduction that does not involve sexual processes.