بِسۡمِ اللّٰہِ الرَّحۡمٰنِ الرَّحِیۡمِ

Allah's Name to commence with the Most Gracious, the Most Merciful

SPECTRUM Science

SOLVED EXERCISES

5

Prepared by:
Rana Amir Munawar

Reviewer:
Saifullah Khalid

Spectrum
Enlightening Generations

Spectrum Science Grade-5
(Solved Exercises)

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Introduction to Spectrum Science Series Book 1 to 5

Spectrum Science Series is a completely new approach to textbooks. This series focuses on doing one thing right; imparting necessary education to young learners with no frills.

The main aim of *the Science Series Grade-4* textbook is to provide a real-life hands-on experience to the young learners regarding scientific phenomena around us. For this reason, we have ensured multiple sections within a chapter to help students digest scientific knowledge and concepts, through a step-by-step process, rushing nothing.

Every chapter starts with a warm-up section, which includes the *Think* and *Explores* section. It is followed by the *Know* section, which presents new concepts. In the end, we have an *Exercise* section, which includes the *Activity Time* section to test that which students have learnt.

Think

This section rekindles the *existing repository* of *knowledge* and information about young children. Each *Think* activity is aligned with given SLOs, focusing on exercising the mental processing of a child. It aims at directing the students toward the subject of the chapter.

Explore

The *Explore* section asks the children to *perform* an activity. The student has to write the results of their exploration. Combined with *Think* activity, the *Explore* section aims at gearing up the young learners towards the content of the chapter.

Know

The essence of the unit lies in this section. It is carefully *constructed* to disseminate knowledge that adheres to the SLOs and that caters to the curious young minds of the readers. The structure has been ensured to maintain continuity of topics within a chapter, which leads to fun reading and a better understanding of concepts.

Activity

This section comes at the end of the chapters with a focus on *cementing* the knowledge learned by students through *practical* activity. These activities take a cue from the content of the chapter and ask the student to apply it in various ways.

The language of the book has been reviewed and proofed by our language experts, who have painstakingly tried to smooth the edges and maintain continuity within texts.

Spectrum Science Teaching Guide Grade-5

Spectrum Science Teaching Guide consists of unit-wise worksheets, solved exercises of the book, unit-wise assessment papers, a terminal assessment and lesson plans. It is designed to effectively support the teachers in student-centered teaching strategies, with simple and clear instructions.

The following key features of the lesson plans make teaching easier for teachers:

⇒ **Student Learning Outcomes (SLOs)** are carefully planned goals for what students will learn. These also define what students will know and be able to do by the end of the lesson.

⇒ **Prior Knowledge** connects students to what is being taught in class.

⇒ **Resources** are required material in the lesson. Teachers are encouraged to arrange necessary materials in advance.

⇒ **Warm-up** is an icebreaker. These are done to develop students' interest in the subject and generate engagement.

⇒ **Lesson Structure** is the central part of the lesson plan. Its goal is to ensure that learning outcomes are achieved through explanation, demonstration, activities, class discussion, and brainstorming. Referencing the text, illustrations and pictures in the manual will make the lesson engaging and interesting. Teachers are encouraged to collect student feedback to determine if learning outcomes are being achieved.

⇒ **Conclusion** summarizes the topic and often includes an assessment of the topics covered in a particular lesson.

⇒ **Class Assignments** based on worksheets or activities. The teacher can assign it for homework.

⇒ **Homework** is assigned to students during the lesson to reinforce what they have learnt.

Conclusion

We hope teachers and students will find *Spectrum Science Series Books 1-5* thoroughly beneficial. These books contain modern teaching approaches which help students to become curious learners of science.

We wish all the teachers and students using Spectrum Science Series Books 1-5 all the best.

Solved Exercises

Unit-1- Importance of Science

Model Answers

Exercise 1

Answer the following questions.

i. Science is a study through which we get knowledge about the structure and attitude of the material world.
ii. Science is deeply connected with our everyday lives because it provides comforts to our lives. All the electronic and non-electronic gadgets/instruments, medical advancements and different machines are the examples of scientific connection to our lives.
iii. Science studies the physical universe which includes the components of the material world around us like atoms, plants, galaxies, ecosystems, people as well as the natural forces on these things.
iv. Science contradicts with the existence of God which is false because science only deals with physical phenomenon and explanations. It has nothing to do with spiritual and metaphysical world.
v. The Bait-al-Hikmah was a place of learning in the Muslim world, in the Abbasi Caliphate.

Exercise 2
Fill in the blanks with correct words.

i. The technologies, medical advances and knowledge that improve our worldly lives every day are the result of scientific research.

ii. The first completely synthetic plastic was made by a chemist in 1900s.

iii. Science can only answer in terms of physical phenomena and explanations.

iv. In the late 1700s, Edward Jenner fist convincingly showed that vaccination worked.

v. Muslim civilization always valued learning and knowledge.

vi. If we want to spread peace all over the world, we should make progress in science and technology seeking the reward from Allah.

vii. Scientific knowledge is not absolute; it is tentative and subject to change.

viii. We should use the scientific knowledge for the welfare and benefit and humanity.

Exercise 3

Complete the translation of the following Ayah of the Holy Quran.

"Surely, in the creation of the heavens and the earth and in the alternation of the night and day, there are science for the people of wisdom." (Sura-Al Imran: 190)

Activity:

Computer:

An English inventor named Charles Babbage designed the first computer in the 1830s. It was mechanical not electronic, because scientists did not then know how electricity worked. The designed called for more than 50,000 moving parts.

Robots:

Leonardo Da Vinci designed a humanoid robot in 1464. Da Vinci's robot was called the "mechanical knight", and it could move it arms, sit, and stand independently. The word "Robot" was first used in a play called "Rossum's Universals Robots".

Aeroplanes:

Orville and Wilbur Wright are famous for creating the first successful airplane. The first American flight pioneers, The Wright Brothers were the brains behind the first controlled and sustained human flight on December 17, 1903.

Bulb:

The first practical commercial light bulbs were created by Thomas Edison in 1879. The filament used in Thomas Edison's first practical commercial light bulb came from is observation of a bamboo fishing line while observing a total solar eclipse.

Unit-2- Classification of Living Things

Model Answers

Exercise 1

Answers of questions.

i. Scientist have divided all living things/organism into five main groups. These groups are called kingdoms. Following are the five kingdoms of organism.
   a. Kingdom Monera
   b. Kingdom Protista
   c. Kingdom of Fungi
   d. Kingdom Plantae
   e. Kingdom Animalia

ii. Algae considered as a plant because it belongs to kingdom of Protista and they are usually found in ponds, lakes or other water bodies.

iii. Kingdom Monera is a bacteria, a microscopic and unicellular organism. They are mostly found in air, water and the top layer of the soil.

iv. Following are the key features of Fungi.
   a. Fungi do not have chlorophyll; therefore, they cannot make their own food.
   b. They absorb nutrition from living or dead organisms.

v. Flowering plants are different from non-flowering plants due to following reasons:
   a. Flowering plants have flowers, whereas non-flowering plants don't.
   b. The seed of Flowering plants are enclosed inside fruit, whereas the seed of non-flowering plants are enclosed in special structures called cones.
   c. Flowering plants are also called angiosperms, whereas non-flowering plants are also called gymnosperms.

vi. The difference between worms and insects are as follows:

S. #	WORM	INSECTS
1.	They have long, snake-like bodies.	They have small bodies.
2.	They do not have any bones or legs.	Their body is divided into three parts: the head, thorax and the abdomen.

vii. Biodiversity is existence of a wide variety of plants and animals in their natural environments on our Earth. The biodiversity of plants is important because they are the source of food and shelter, and the biodiversity of animals is important because they are used for food production and agriculture.

viii. Biodiversity is being lost due to the loss of habitats, climatic changes, pollution, overuse of resources, deforestation and hunting, etc.

Exercise 2

Fill in the blanks.

i. The scientists have classified all living things into five main groups called Kingdoms.

ii. Algae belong to kingdom Protista.

iii. Fungi do not have chlorophyll.

iv. Flowering plants are also called angiosperms.

v. Animalia is the largest kingdom.

vi. Ants and flies are common examples of insects.

Exercise 3

Can you name the animals that have the following features?

1.	tube feet	echinoderms
2.	soft porous body	sponges
3.	hard shell on body	molluscs
4.	snake-like body	worms
5.	six jointed legs	insects

Exercise 4

Look at the pictures below. Identify these organisms and write their names.

1.

2.

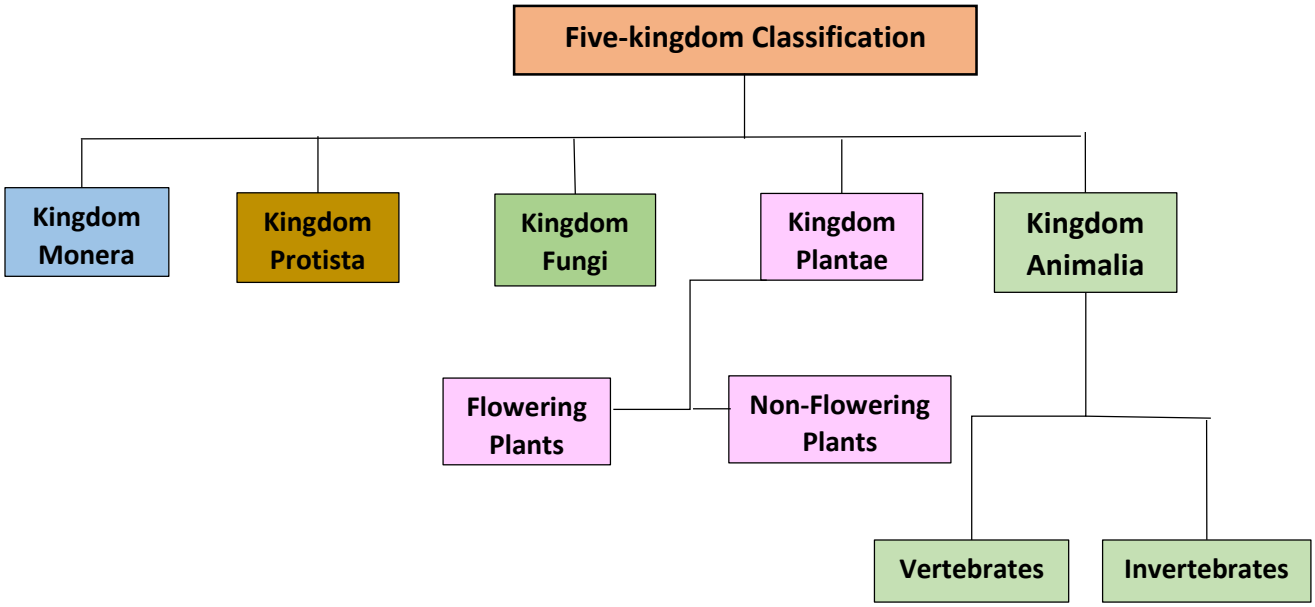
3.

4.

5.

Exercise 5

Complete the flowchart of the five-kingdom classification.



Exercise 6

Prepare a presentation on the differences and similarities in vertebrates and invertebrates.

VERTEBRATES	INVERTEBRATES	SIMILARITIES
Vertebrates possess a backbone and an internal skeleton.	Invertebrates do not possess a backbone not an internal skeleton.	Vertebrates and invertebrates belong to the kingdom Animalia.
Invertebrates have an exoskeleton.	Invertebrates have an exoskeleton.	Both vertebrates and invertebrates show bilateral symmetry.
All vertebrates have closed circulatory systems.	Nearly all invertebrates possess an open circulatory system.	Gills are present in some vertebrates and invertebrates.
Mode of nutrition is usually heterotrophic.	Mode of nutrition includes Autotrophic, Parasitic and Heterotrophic.	Both vertebrates and invertebrates have a nervous system.
5 % of animal species are vertebrates.	95% of animal species are invertebrates.	Both vertebrates and invertebrates have a life cycle.
Mammals, fish, reptiles, amphibians, and birds are examples of Vertebrates.	Flatworms, arthropods, sponges, insects are a few examples of Invertebrates.	Both vertebrates and invertebrates composed of cells.

Exercise 7

Make a list of the ways human beings can adopt to protect biodiversity of both plants and animals.

Following are the ways human beings can adopt to protect biodiversity of both plants & animals.

- We should avoid deforestation to protect animals and plants in their natural habitats.
- We should reduce all kinds of pollutants in the environment.
- We should conserve forests and start reforestation.
- We should reduce all kinds of pollutants in the environment.
- We should avoid unnecessary burning of fossils fuels.
- We should practice recycling, reusing and reducing strategies.
- We should raise public awareness on the importance of protecting biodiversity.

Exercise 8

Discuss the Ayah number 30 of Surah Al-Anbiya of the Holy Qur'an with reference to some scientific facts.

Allah said the Holy Qur'an, "and We made every living thing out of water."

Only after advances have been made in science, we now know that cytoplasm, the basic substance of the cell, is made up of 80% water. Modern research has also revealed that most organisms consist of 50% to 90% water and that every living entity requires water for its existence.

Activity: Divide the students into three or four groups, give them task to make a fact file of living organisms from the given kingdom, on page 25, using the stickers on the one side of page, while the information on the corresponding page.

Unit-3- Human Organ Systems

Model Answers

Exercise 1

Answer the following questions.

i. The musculoskeletal system provides support, shape and movement to the body.
ii. Voluntary muscles are under our control, whereas involuntary muscles are not under our control.
iii. The role of stomach in digestive system is to mix the food with acids, gastric juices and enzymes. Enzymes further mash the food into a soft paste and passes the food to the small intestine.
iv. The role of blood vessels is to carry blood to all parts of the body.
There are three types of blood vessels
   a. Arteries
   b. Veins
   c. Capillaries
v. The function of alveoli is to absorb oxygen from blood through capillaries and gives up carbon dioxide.
vi. The function of medulla is to control all involuntary actions like breathing, heartbeat and digestion.

Exercise 2

Circle the correct answer.

i.
   a. 400 b. 500 c. 600
ii.
   a. stomach b. mouth c. intestine
iii.
   a. heart b. brain c. lungs
iv.
   a. cerebrum b. cerebellum c. medulla
v.
   a. Respiratory system b. circulatory system c. digestive system

Exercise 3

Discuss the Ayah number 56 of Surah Al-Nisa of the Holy Qur'an in relation to nerves in the human nervous system.
Ans: In the Holy Qur'an Surah Al-Nisa: 56, almighty Allah SWT associated between the sensation f pain and the skin when roasted and burnt totally, thus losing its structure and function. When sensation of pain is lost, anew fully composed and functional skin is replaced where the nerve

endings. Thus, the Qur'anic scientific miracles are crystallized. Feeling of pain as perceived in medical facts are very much compatible with the statements of the Holy Qur'an, the true book of Allah Who knows everything.

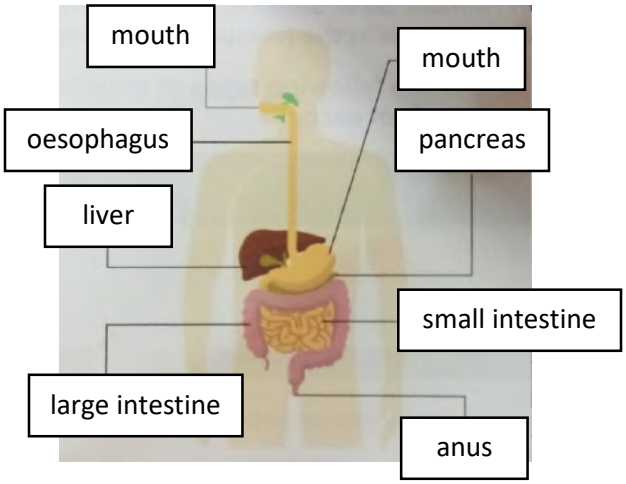
Exercise 4
Explain the working of the following types of muscles.
Give at least one example of each.

Types of Muscles	Working	Examples
Skeletal Muscle	Skeletal muscles are directly attached to our bones with tendons	legs
Cardiac Muscle	Cardiac muscles are not attached to any bones.	heart

Exercise 5
Match each organ in column A with its function in column B and write the correct answer in the given spaces.

Column A	Column B
brain	pumps blood around the body
heart	digests food
stomach	exchange gases
lungs	controls all bodily functions

Exercise 6
Name the organ system and label its parts.



Unit-4-Plant Structure

Model Answers
Exercise 1
Answer the following questions.

i. Flowers are the most beautiful and attractive parts of the plants. Sometimes known as bloom or blossom.
ii. Petals are different from Sepals, because petal is the inside colorful part of sepals. Insects and birds are attracted their bright colors and fragrance.
iii. Stamens are the male reproductive organ of a rose flower. Each stamen consists of two parts: an anther and a filament.
iv. Carpel or Pistil is the female reproductive organ of a rose flower. Each carpel or Pistil is consisting of a stigma, style and an ovary.
v. Following are the dicot plants:
   - Buttercups
   - Rose
   - Beans
   - Peas

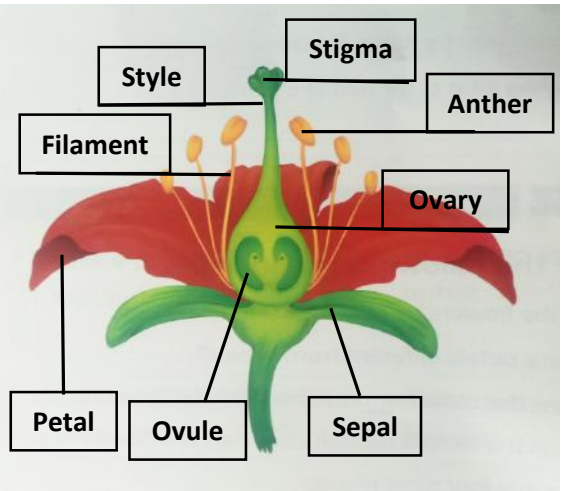
Exercise 2
Fill in the blanks.

i. Insects and birds are attracted by the bright colors and fragrance of Petals.
ii. The sepals are collectively called the calyx.
iii. Most monocots have a fibrous root system.
iv. Cotyledon is a seed leaf.
v. Wheat is a monocot plant.
vi. Allah brings out of the dead and brings the dead out of the living.

Exercise 3
Write 'T' for true and 'F' for false statement.

i. The carpel is also called the calyx. **F**
ii. The pollen grains look like yellow powder or dust. **T**
iii. The floral leaves of monocots are in multiple of three. **T**
iv. The ovary produces pollen grains. **F**
v. Dicot plants mostly have a tap root system. **T**

Exercise 4
Label the parts of the rose flower.



Exercise 5
Write three differences between a monocot plant and a dicot plant. Give at least two examples of each.

Monocot Plants	Dicot Plants
They have one cotyledon in their seeds.	They have two cotyledons in their seeds.
Their leaves have veins running parallel to each other.	They have veins on their leaves that form a branched network.
They have floral leaves which are usually arranges in groups of three or multiple of three.	They have floral leaves which are usually arranged in groups of four or five or multiple of four or five.
Examples	**Examples**
wheat	beans
tulip	rose

Science Lab:
Take the students to the school science lab to perform an experiment to find out the difference between a monocot seed and a dicot see.

Objective: The students will be able to differentiate between a monocot seed and a dicot seed.
You will need following items.

- The maize and French bean seeds
- Dissection box
- Lab gloves
- A magnifying glass.

Maize

French beans

Dissection Box

Lab Gloves

Magnifying glass

Unit-5-Reproduction in Plants

Model Answers

Exercise 1
Answer the following questions.

i. **(a) Pollination:** A process by which the pollens of a flower get transferred to the stigma of another flower called pollination.
(b) Fertilization: A process by which pollen joins the ovule through pollen tube and fertilizes it called fertilization.
ii. There are two types of pollination; Self-pollination & Cross-pollination.
iii. The process of reproduction mainly occurs through spores and stems. Plants tend to reproduce by spores instead of seeds, because spores are small and lightweight and therefore, they develop on the underside of the leaf. Whereas plants grow directly from stems and the stems sprout above the ground (such plants include potatoes).
iv. Germination is when a seed requires favorable conditions to grow into a new plant. These conditions include water, light, temperature (warmth) and oxygen.
Steps:
1. The first stage is a seed swells up when it gets water, since it makes the seed coat burst open. Further making the seed develop into a baby plant.
2. In the second stage water breaks down its stored food that provides energy to the growing embryo.
3. Then officially the roots start growing downwards and the young shoot upwards.
4. The sunlight makes photosynthesis possible for the new plant.

v. Animals and birds are one of the sources of seed dispersal. They simply eat the fruit and excrete the undigested seed far away from the parent plant. Because some seeds are sticky and some have spikes, therefore they stick to the skin of animals and feathers of birds and this is the way they get dispersed too far off places.

Exercise 2
Fill in the blanks.

i. Ovules are the female cells of the flower.
ii. Pollen grains are the male cells of the flower.
iii. Some fruits such as mango and peach, have only one seed.
iv. Some plants such as ferns, reproduced by spores.
v. Sugar cane is an example of plants that grow from stem cuttings.
vi. The concept of diverse pairs of plants was stated in the Holy Qur'an around fourteen centuries ago.

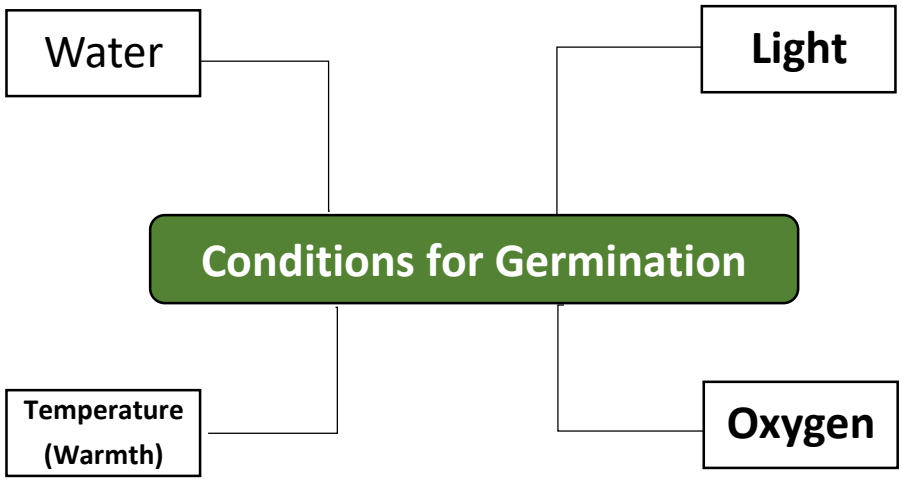
Exercise 3

Write T for a true and F for a false statement.

i.	Stamen is the female reproductive part of the flower.	F
ii.	A sweet potato plant develops from buds on old stems.	F
iii.	The plantlets grow along the edges of the leaves.	T
iv.	The sticky seeds dispersed by water.	T
v.	Dandelion seeds are carried away by wind.	T

Exercise 4

Fill in the boxes to show the favourable conditions of germination.



Unit-6- Introduction to Microorganisms

Model Answers

Exercise 1

Answer the following questions.

vi. Microorganisms are extremely small living creatures that cannot be seen without a microscope. They are also known as microbes. The examples are bacteria, virus and fungi.

vii. Fungi are multicellular organisms. They are found in different shapes and sizes. They can be microscopic as well as macroscopic.

viii. The main advantages of microorganisms are as follows;
   a. Some microorganisms helpful in the preparation of food.
   b. A number of bacteria are found in the human intestine. They help in digestion of food.
   c. Microorganisms are also used for the production of medicines and vaccines.

ix. Disease-causing microorganisms are called pathogens. For examples viruses, bacteria and fungi.

x. Diseases spread because of germs which pass on from an infected person to a healthy person through air, water, food animals as well as some insects.

xi. We can protect ourselves from diseases by taking following measures;
   a. Always wash hands well before eating and after using the toilet.
   b. Eating uncovered food should be avoided.
   c. Fruits and vegetables should always be washed well before eating them.
   d. Brushing the teeth twice a day to keep your mouth and teeth clean and safe from germs.
   e. Always cover your mouth and nose with a tissue when cough or sneeze.

Exercise 2

Fill in the blanks with correct words.

ix. Microorganisms can only be seen under a <u>microscope</u>.

x. Viruses are unicellular <u>organisms</u>.

xi. Pneumonia is caused by a <u>bacteria</u>.

xii. When an infected person sneezes or coughs, germs are released into the <u>air</u> <u>around</u>.

xiii. <u>Tetanus</u> is the disease that is caused through skin.

xiv. A <u>vaccine</u> is a harmless from of germs to protect us from diseases.

Exercise 3

Write 'T' for a true or 'F' for a false statement.

i. Microorganisms are also known as microbes. T

ii. The athlete's foot is a viral disease. F

iii. Milk sours because of bacteria. T

iv. Malaria is caused by the bite of a male mosquito. F

v. Some fungi are used to prepare antibiotics. T

vi. Chickenpox is caused by polluted water. F

Exercise 4

Hadith number 5728 of Sahih Bukhari says regarding the concept of spread of diseases, "If you hear of an outbreak of plague in a land, do not enter it. And if the plague breaks out in a place while you are in it, do not leave that place."

According to today scientists affirm that healthy people who have no symptoms in the place of plague are already carrying the microbes and so they represent a real threat because they may transfer the plague to another place if they move to it.

Exercise 5

Complete the following table.

Microorganism	Features	Diseases
Bacteria	**They are found in air, water and soil. They can grow and reproduce inside or outside the human body.**	**Cholera, pneumonia, typhoid, throat infection, food poisoning, etc.**
Virus	**They are made of chemicals like those found in the living bodies. They live and grow only in the living cells of humans, animals and plants.**	**Influenza, measles, hepatitis, chickenpox, COVID-19, etc.**
Fungi	**Fungi are plants without chlorophyll. They take their food from animals or other plants. Fungi are mostly harmless, but some fungi can cause diseases in humans and animals.**	**Athlete's foot, fungal eye infection, ringworm, etc.**

Unit-7- Changes in the States of Matter

Model Answers

Exercise 1

Answers of questions.

I. A matter can change its state by either heating or cooling, means change in temperature. For example; we put ice cubes in our drinks to cool it and later we notice that the ice cubes have melted in the drink because of the change in its temperature once taken out from the freezer.

II. **Sublimation** is the process in which a solid is changed directly to a gas without first becoming a liquid. For example, dry ice sublimes at room temperature.

III. **Deposition** is the process in which a gas changes directly to a solid without first becoming a liquid. Deposition is the reverse of the sublimation process. This process takes place at very low temperature. For example, frost is the deposition of water vapour from humid air.

IV. **Stage of Evaporation**: The heat of the Sun causes water to evaporate from the water bodies, such as seas, oceans, lakes, etc.

V. **Stage of Condensation**: Water vapours in the air cool down and condense to form clouds and tiny droplets. These tiny droplets join together to form bigger drops. Finally, the bigger drops fall down on Earth as rain.

VI. Melting is the process in which a solid change into liquid on heating.

VII. Freezing is the process in which a liquid change into solid on cooling.

VIII. Precipitation is the process in which water falls from the sky in the form of rain, snow, sleet and hail.

IX. There are two types of changes in matter. Physical Changes & Chemical Changes.

X. A change is the appearance of matter is called a Physical Change. These changes are temporary in nature and do not produce any new substances. These changes are also called reversible changes. For example, dissolving sugar in water and changing of water into the ice are examples of physical changes in matter.

XI. A change in the chemical composition of matter is called a Chemical Change. Chemical changes are permanent changes, and they produce a new substance. These changes are also called irreversible changes. For example, burning a piece of wood, it turns into ashes. This new substance can never be changes back into wood.

Exercise 2

Fill in the blanks.

I. Evaporation is the process by which a liquid change into gas.

II. Water falls from the sky in the form of rain, snow, sleet and hail**.**

III. A new substance is formed in a chemical change.

IV. Dry ice is made by the process of freezing.

V. A change in the appearance of matter is called a physical change.

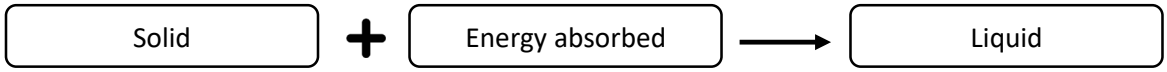
VI. Dissolving sugar in water, crushing an aluminum can and changing of water into the ice are the examples of physical changes in matter.

VII. Allah has created everything and designed it in a perfect measure.

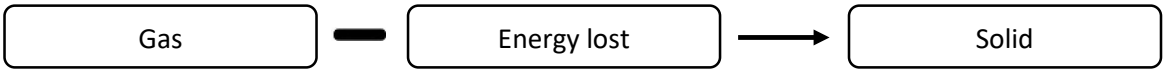
Exercise 3

i. Melting

ii.

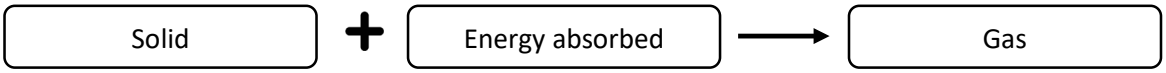


iii. Deposition

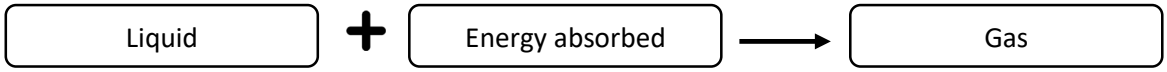


iv. Sublimation

v.



vi. Evaporation



Exercise 4

i. freezing
ii. evaporation, condensation
iii. infiltration
iv. chemical
v. irreversible

Unit-8- Magnets and Electromagnets

Model Answers

Exercise 1
Answer the following questions.

1. Hard magnet is the one which does not lose its magnetism easily once it is magnetized. For example; steel. Whereas soft magnet is the one which can easily magnetize but they lose their magnetism easily. They are also called temporary magnets. For example; iron.
2. Magnetism is the power of a magnet to attract other objects, it is invisible but a powerful force. For example; the mixture of sand in iron fillings which is not easy to separate except with the help of another magnet which can pull the iron filling to itself, separating iron from sand.
3. Magnetic forces get weaker at a longer distance because the distance from the magnet increases. That is because the area around the magnet within which it attracts magnetic materials is known as its magnetic field.
4. Magnetic compass is a device to detect magnetic field since magnetism is invisible. It main use is to find directions. Common uses are determine the direction of the Qibla or like in the ancient times magnetic compasses were used to find directions in the oceans.
5. Electromagnets are temporary and artificial magnets because they work when electric current flows through them.
6. A few examples of electromagnets can be like radio speaker, an electric door lock uses an electromagnet to lock the door or large and powerful electromagnets used in magnetic cranes; often used in scrapyards to lift heavy loads.

Exercise 2
Fill in the blanks.

I. Magnetic forces become weaker as the distance increases.

II. Opposite poles of different magnets attract each other whereas like poles push each other.

III. A magnetic object inside the magnetic field of a magnet will be attracted to it.

IV. Hard magnetic materials are also known as permanent magnets.

V. The strength of an electromagnets depends on the number of coils.

VI. A radio and an electric door have electromagnet inside them.

VII. The Earth acts like a giant magnet.

VIII. The Holy Qur'an mentioned that Allah has sent down the iron which has strong power and also has benefits for the people.

Exercise 3

i. A magnetic compass needle always points towards the North pole of the Earth. T

ii. Electromagnets are natural magnets. F

iii. Soft magnetic materials do not lose their magnetism easily. F

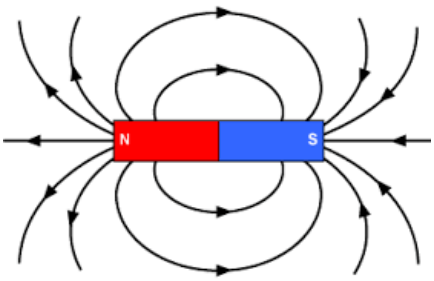
iv. The magnetic field can be detected by magnetic compass. T

v. A basic electromagnet consists of four parts. F

vi. The Earth's invisible magnetism helps animals such as birds, bats, sharks and mice to find their way around. T

Exercise 4

Draw the pattern of magnetic field lines around the bar magnet given below.



Unit-9-Forces on Earth

Model Answers

Exercise 1

Answer the following questions.

i. **Electrostatic force** is an attractive or repulsive force that is produced by charged objects, and Magnetic **force** is an invisible of each magnet that pulls metal objects.

ii. **Elastic Force:** The force that allows some materials to return to its original shape after being stretched or compressed.
Muscular Force: *The force that is created through the use of muscles* or exerted by the body to pull, push, lift, stretch or twist an object.

iii. If the weight of an object is 2400 N on Earth, its weight on the Moon will be 400 N. This is because the Earth's gravity is six times greater than the Moon's.

iv. The tendency of an object to stay at rest or in motion unless a force acts upon it, is called **inertia**. For example, the moving spaceship will continue to move at the same speed because of inertia.

v. **Mass** is the total amount of matter present in an object, and it is measured in Kilogram (kg), whereas, **weight** is the force of gravity on an object, and the measuring unit for weight is Newton (N).

vi. **Net Force**: The sum of all the forces acting on a body is called the **net force**.
Balanced Force: When the net force is zero, the forces applied on a body are said to be **balanced**.

vii. **Unbalanced Force**: If the net force applied on a body is not zero, the forces are said to be **unbalanced**. **Exercise 2**

Fill in the blanks.

i. We need the frictional force to walk and drive vehicles.

ii. The measuring unit of weight is newton (N).

iii. The measuring unit of mass is kilogram (kg).

iv. Magnetic force is used to pull magnetic objects.

v. Weight depends upon gravitational force.

Exercise 3

Write 'T' for true and 'F' for false statement.

I.	The weight of a body remains the same on Earth as well as on the Moon.	F
II.	Mass is the total amount of matter in an object.	T
III.	Inertia is important to move or stop an object.	T
IV.	Rainfall is due to the force of gravity.	T
V.	Einstein was the first to introduce the concept of gravity.	F

Exercise 4

Identify the forces and write their names under their respective pictures.

i. friction
ii. muscular
iii. elastic

Exercise 5

Complete the translation of the following Ayah of the Holy Quran.

i. Allah
ii. sea
iii. Heavens
iv. earth
v. ever gracious
vi. mankind

Unit-10-Light and Shadow

Model Answers

Exercise 1
Answer the following questions.

i. Without Sunlight we use artificial sources of light for example; electric bulbs, headlights, torches, candles and street lights.
ii. When the source of light is at a lower angle the shadows made are long, however when the source of light is at a higher or upper level, the shadows are relatively shorter, or the same size of the original object.
iii. Light is a form of wave, and prefers travelling from one point to another in the form of rays, and collectively the rays form a beam.
iv. Three things are needed for the formation of a shadow.
    - An object,
    - source of light
    - a surface.
v. The structure of a pinhole camera: It is a small box with a pinhole at one end with a screen at the other end. The screen is made of a tracing paper. The tiny hole is made from the tip of a pen or a pin. The sharpness of the image depends upon the size of the hole. The smaller the hole the sharper the image.
Working of a pinhole camera: an object is placed in front of the pinhole camera where the light falls on it and it reflects. Some of the light is entered into the camera through the pinhole and falls on the screen. Then a small inverted image of the object is formed on the screen.

Exercise 2
Fill in the blanks.

I. The sunlight makes things visible during the day.
II. Light travels in a straight line.
III. Wood, rock and steel are opaque materials.
IV. Transparent materials allow light to pass through its shadow.
V. The pinhole camera was invented by a Muslim scientist, Ibn Al-Haytham.

Exercise 3

Write T for a true and F for a false statement.

I.	Wood is a translucent material.	F
II.	A shadow is always formed on the same side to the light source.	F
III.	Opaque materials so not allow light to pass through them.	T
IV.	The shadows are short in the morning and evening.	F
V.	A pinhole camera has a very small hole.	T
VI.	The image formed by a pinhole camera is inverted.	T

Exercise 4

Complete the translation of the following Ayah of the Holy Qur'an.

i. night
ii. day
iii. signs
iv. believe

Unit-11 Simple Machines

Model Answers

Exercise 1

Answer the following questions.

xii. The lever; crowbar, claw hammer, a pair of pliers
Pulley; pulley used in raising a load
inclined plane; ramps, staircases, hilly roads
screw; a screw bolt
wedge; knife, axe, plough.
wheel and axle; steering wheel of a car, bicycle pedal.

Class 1 has the fulcrum placed between the effort and load, Class 2 has the load in-between the effort and the fulcrum, and Class 3 has the effort between the load and the fulcrum.

xiii. Following are the three classes of lever;

- Class 1: the fulcrum places between the effort and load
- Class 2: the load in between the effort and fulcrum
- Class 3: the effort between the load and the fulcrum

xiv. Pulley is a mechanical device which contains a wheel and rope/belt/chain to lift heavy objects. The wheel of the pulley is usually fixed to a hinge and rotates on an axle or shaft. There are three types of the pulley; fixed pulley, movable pulley and compound pulley.

xv. Ramps and wedges use slopes to make forces bigger or smaller. Ramps make a difficult lifting job an easy one. However, wedges turn a small force at the thick end into a large force at the thin end, and are often used in cutting tools, such as axes.

xvi. Screws are used in holding things together as they push or pull the object. Screws may also be used for lifting heavy objects and to tighten things.

xvii. A wheel and axle are a simple lifting machine consisting of a rope which unwinds from a wheel on to a cylindrical drum or shaft joined to the wheel to provide mechanical advantage.
Following are some of the uses of a wheel and axle;

- Bicycles
- Ferris wheel
- Electric fan
- Analog clock
- Car tires

xviii. Al-Jazari was a famous Muslim Arab scholar. He was a mechanical engineer and an inventor who gained glory and fame with his famous book; 'a Compendium on the theory and useful practice of the mechanical arts.' It was the most important treatise of the Islamic tradition of mechanical engineering and ground breaking work in the history of technology. All of

because of his fundamental mechanical inventions, Al-Jazari has been described as 'the father of modern-day engineering.' Also because of his invention of an early programmable humanoid robot, he has been hailed as the 'father of robotics.'

Exercise 2

Fill in the blanks with correct words.

xv. Time, human effort
xvi. Class two lever
xvii. Wedge
xviii. Fulcrum
xix. Fixed pulley

Exercise 3

Write 'T' for a true or 'F' for a false statement.

i. False
ii. False
iii. True
iv. True
v. True

Exercise 4

i. Can opener
ii. Shovel
iii. Scissor
iv. Wheel cart

Unit-12- Sound

Model Answers

Exercise 1

Answers of questions.

I. A sound is produces when some vibrations pass through matter. Vibrations travel in the form of waves.

II. **Vibration**: When an object moves backwards and forwards very fast, like a tuning fork, we say it is vibrating.

III. **Frequency:** The number of vibrations produced in one second is called the frequency. It is measured in Hertz (Hz).

IV. **Noise**: An unwanted, unpleasant or loud sound is defined as a noise.

V. Vacuum is a space in which there is no particles to pass on the vibrations and sound needs medium to travel and there is no medium in vacuum therefore sound doesn't travel in a vacuum.

VI. More vibrations in a second produced a sound of higher frequency, while less vibrations in a second produce a sound of lower frequency.

VII. Echoes are produces when sound waves hit hard surfaces, such as a wall, some waves travel through it. Others bounce back, and we hear the same sound again. These bounced back or repeated sounds are called echoes.

VIII. Human beings can play important role in reducing noise pollution in the following ways.

- Using effective silencer in vehicles and ensuring their proper service.
- Installing sound control systems in industries.
- Ensuring a ban on using pressure horns near schools, hospitals and other public places.
- Avoiding unnecessary and overuse of loudspeakers and sound systems.
- Planting trees (dense trees are useful in the reduction of noise pollution).

Exercise 2

Fill in the blanks.

I. Every sound is produced by vibrations.

II. The sound waves spread out in circles.

III. A sound can be measured in number of vibrations.

IV. An echo is a repeated sound.

V. Transport noise and industrial noise are examples of noise pollution.

VI. Allah gave us hearing, vision and intellect, that we might give thanks to Him.

Exercise 3

Write 'T' for a true and 'F' for a false statement.

I. **True**

II. **False**

III. **True**

IV. **True**

V. **True**

Exercise 4

Write the frequency range of hearing of the given animals.

Animals	Bat	Cat	Fish	Snake
Frequency Range	60 Hz – 130,000 Hz	60 Hz – 65,000 Hz	70 Hz – 3,300 Hz	100 Hz – 1,000 Hz

Unit-13- Soil and Soil Erosion

Model Answers

Exercise 1
Answer the following questions.

1. **Soil**: Soil is important because most of the land surface is covered with soil. It provides plants with essential nutrients for their growth. It enables fruits and vegetables to grow. Soil also purifies water by filtering out pollution, such as domestic and industrial wastes, insecticides and herbicides, etc. thus, soil plays an important role in the water cycle.
2. Soil has different layers with different colours and characteristics as follows:
3. Topsoil, Subsoil, Parent Material and Bedrock.
4. Subsoil is important for the growth of plants because it serves as a storehouse for plant nutrients and minerals.
5. The removal of the top layer of soil by winds or water is called soil erosion. The causes of Soil Erosion are floods, heavy rain, winds and deforestation.
6. The protection of soil from erosion is called soil conservation.
7. Cutting trees on a massive scale is called deforestation. Soil then exposed to strong-wings and heavy rains which lead to soil erosion.
8. Soil erosion removes topsoil which contains most of the nutrients and minerals essential for the growth of plants. The loss of this top soil results in lower yields and the land becomes barren.

Exercise 2
Fill in the blanks.

I. Earthworms, fungi and many other organisms live in the topsoil.
II. Topsoil contains water which is rich in nutrients.
III. Subsoil is rich in plant nutrients and minerals.
IV. Parent material is made of broken rocks.
V. Conservation is the protection of soil from erosion.

Exercise 3

I. **Write 'T' for a true and 'F' for a false statement.**
II. **True**
III. **False**
IV. **True**
V. **True**
VI. **True**
VII. **False**

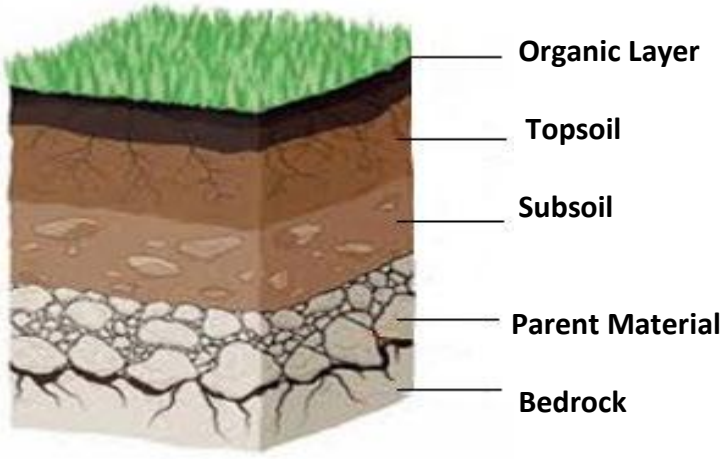
Exercise 4

Complete the translation of the following Ayah of the Holy Qur'an.

"And among His signs is that you see the land still, but when We send down water upon it, it shakes and rises. Surely, He Who revived it will certainly revive the dead; indeed, He has power over everything.

Exercise 5

Label the layers of the soil.



Unit-14-Air and Atmosphere

Model Answers

Exercise 1

Answer the following questions.

I. Air is the mixture of different gases. It consists of nitrogen, oxygen, carbon dioxide, neon, hydrogen and some other gases.

II. The atmosphere is divided into five layers and they are; Troposphere, Stratosphere, Mesosphere, Thermosphere and Exosphere. The atmosphere plays a key role in sustaining life on Earth. It surrounds the Earth like a big blanket.

III. **Air Has Weight**: Blow up two balloons and tie them to the opposite ends of a scale. Tie one more string in the middle of the scale to suspend it. The scale should be balanced at the center point. Now puncture one of the balloons with a pin. Notice that the side with the punctured balloon goes up. This proves that the **air has weight**.

   a. **Air Occupies Space**: Take a bottle and invert it in a bucket of water press the bottle gradually into the water. Observe what happens. The water does not enter the bottle because it is not empty. Air is present inside the bottle.

   b. Now, tilt the bottle slightly. Observe that the air bubbles escape out of the bottle and water fills inside it. This proves that **air occupies space**.

IV. Ozone depletion means the thinning or destruction of ozone in the stratosphere, where it shields the earth from harmful ultraviolet radiation. The side effects of thinning of ozone layer would allow the harmful ultraviolet radiations to reach the Earth's surface which increase the temperature of the Earth's atmosphere. This can also melt glaciers causing floods in some areas.

V. The atmosphere plays a key role in sustaining life on Earth. It surrounds the Earth like a big blanket. It absorbs the heat from the Sun and Keeps the Earth warm. It also responsible for controlling the temperature of the Earth and also influences our weather and climate.

Exercise 2

Fill in the blanks.

I. The Earth is surrounded by a layer of air called the gasses.

II. The most abundant gas in the air is nitrogen.

III. There is 20.94 per cent oxygen in the air.

IV. The meteoroids burn in the atmosphere.

V. The mesosphere is up to 85 kilometers above the Earth's surface.

VI. Ozone layer is present in the Stratosphere.

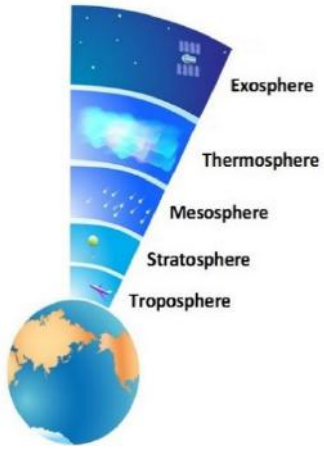
Exercise 3

Circle the appropriate answer.

i. **d. 0.036**
ii. **d. troposphere, stratosphere, mesosphere, thermosphere and exosphere.**
iii. **c. chlorofluorocarbons**
iv. **c. carbon dioxide**
v. **c. atmosphere**

Exercise 4

Label the layers of the atmosphere.



Exercise 5

Complete the following table.

Layers of the Atmosphere	Height from the Surface of the Earth
Troposphere	10 to 12 kilometres
Stratosphere	50 kilometres
Mesosphere	85 kilometres
Thermosphere	513 kilometres
Exosphere	10,000 kilometres

Unit-15-Environmental Pollution

Model Answers

Exercise 1
Answer the following questions.

I. **Environment**: Environment consists of both living and non-living things that surrounds us. It's a condition or surrounding in which a person, animal or plant lives or operates.
II. **Biodegradable Pollutants**: Pollutants that decompose naturally are **biodegradable pollutants**.
III. **Non-biodegradable Pollutants**: The pollutants which do not decompose by natural processes are called **non-degradable pollutants**.
IV. There are three kinds of pollutions;
V. **Land Pollution**; e.g., it includes garbage, rubbish, plastic objects and chemicals.
VI. **Water Pollution**; e.g., harmful pollutants are released into water bodies, directly or indirectly, chemicals or oil spills in water.
VII. **Air Pollution**; e.g., harmful gases, dust, smoke and harmful odours.
VIII. Land pollution causes due to improper disposal of garbage and industrial wastes, improper disposal of agricultural chemicals, such as pesticides, insecticides, herbicides, fungicides, and some fertilizers, etc.
IX. Decaying matter at dumpsites causes unpleasant smell, toxic chemicals seep into the soil and pollute it and plants absorb toxic chemicals through their roots, and land pollution affect the nature and fertility of the soil.
X. **Short note**:
The burning of fossil fuels refers to the burning of oil, natural gas, and coal to generate energy. We use this energy to generate electricity, and to power transportation (for example, cars and planes) and industrial processes. Ever since the invention of the first coal-fired steam engines of the 1700s, our burning of fossil fuels has steadily increased. Across the globe each year we now burn over 4,000 times the amount of fossils fuels burnt during 1776. The effects of the burning of fossil fuels, especially carbon dioxide, are having far-reaching effects on our climate and ecosystems.
    a **The 3 R's Strategy** – reduce, reuse and recycle – all help to cut down on the amount of waste we throw away. They conserve natural resources, landfill space and energy. Plus, the three R's save land and money communities must use to dispose of waste in landfills. Siting a new landfill has become difficult and more expensive due to environmental regulations and public opposition.
    b **Reduce**: the first target is cutting down the amount of waste materials by using both sides of paper, and using cloth napkins instead of paper napkins.

c **Reuse**: it reduces the amount of waste. Using old stuff to make new items, donating is the best manner to reuse material. We can donate our used books, cloths and toys for reuse.

d **Recycle**: Material can be recycled if not used. Recycling turns waste materials into usable materials. It saves energy and reduces environmental pollution. For example, glass bottles, plastic materials and paper can be recycled again and again.

Exercise 2
Fill in the blanks.

vii. Harmful substances that can cause pollution are called pollutants.
viii. Acid rain is the result of air pollution.
ix. Land pollution occurs when people throw garbage onto the ground.
x. The 3 R's strategy is an approach to reduce the amount of solid waste.
xi. Pollutants that decompose naturally are called biodegradable.
xii. Hazrat Muhammad Rasoolullah Khatam-um-Nabiyyeen ﷺ said, "Cleanliness is half of the faith.

Exercise 3

Write down the types of pollution under the given pictures.

vi. Air Pollution
vii. Water Pollution
viii. Land Pollution

Exercise 4
Complete the following table.

Kinds of Pollution	Causes	Effects
Land	1. Improper disposal of garbage & industrial waste.	1. decaying matter at dumpsites causes unpleasant smell.
	2. Improper disposal of agricultural chemicals, e.g., pesticides, insecticides, etc.	2. it can affect the nature and fertility of the soil.
Air	1. Burning fossil fuels, i.e. coal, oil and natural gas. The smoke from vehicles.	1. Breathing in the polluted air may cause several diseases, i.e., asthma and bronchitis.
	2. Deforestation is another cause of air pollution. Natural disaster such as volcanic eruptionor wildfire.	2. it damages the ozone layer, which protects us against ultraviolet radiations from the Sun.

Unit 16- The Earth and Satellites

Model Answers

Exercise 1
Answer the following questions.

i. The structure of the Earth is divided into different layers. There are four main layers of the structure of the Earth: the crust, the mantle, the outer core and the inner core.
ii. **Natural Satellite**: A natural satellite is *an object that orbits a planet or other body larger than itself and which is not man-made.* Examples of natural satellite are the Earth and the Moon.
Artificial satellites: Artificial satellites are man-made objects. They are launched into space using rockets. These satellites orbit around the Earth or other celestial bodies.
iii. The Moon exerts its force on the Earth. But its gravitational force is smaller than the Earth's. The Moon's gravitational force is one-sixth of the Earth's. The sea tides are also caused by the Moon's gravitational pull.
iv. The Moon has a very thin and weak atmosphere, called an exosphere. The exosphere does not provide protection against ultraviolet radiations and meteoroids.
v. **Waxing Crescent**: After the New Moon, a silver wedge can be seen in the sky. It is called the Crescent Moon.
Waning Gibbous: After the Full Moon, the visible part of the Moon begins to decrease. It becomes less and less illuminated every night.
Waning Crescent: The Moon continues to decrease with each passing night until it becomes a crescent again.
vi. Artificial Satellites have different uses; for example, weather satellites forecast atmosphere condition around the world. Communication Satellites are used to sent radio, television and telephone signals throughout the world, and Navigation Satellites are used to find out the exact location that helps people while travelling.
vii. **Short Note on NASA**: NASA stands for National Aeronautics and Space Administration. It is a U.S. government agency that is responsible for science and technology related to air and space. NASA played a key role in space exploration and had many successful missions. According to NASA, its programs including Mercury, Gemini and Apollo helped it learn about flying in space and resulted in the first human landing on the Moon in 1969. NASA's continuing operations include missions to the planets Mares, Saturn and Pluto. Missions to Jupiter are also planned for the near future.

Exercise 2
Fill in the blanks.

i. The fixed path of a satellite is called the orbit.
ii. The Moon takes 27 days to orbit the Earth once.
iii. The gravitational force on the Moon is smaller of that on the Earth.

iv. The phases of the Moon are caused by its rotation around the Earth.

v. NASA stands for National Aeronautics and Space Administration.

vi. During Waxing Quarter phase, half of the Moon is illuminated.

vii. During Waxing Gibbous phase, more than three-quarters of the Moon is visible.

viii. The Mantle covers more than 82% of the Earth's volume between the crust and the core.

Exercise 3

Write 'T' for a true and 'F' for a false statement.

i. **True**
ii. **False**
iii. **True**
iv. **False**
v. **True**
vi. **False**
vii. **True**
viii. **False**

Exercise 4

Discuss the Ayah number 39 of Surah Ya-Seen of the Holy Qur'an in relation to the way the Moon revolves around the Earth.

Allah said in the Holy Qur'an, "And We have determined phases for the Moon until it returns (appearing) like an old date branch." Surah Ya-Seen: 39

It says that the Moon does not follow a regular orbit like the satellites of other planets. As it orbits the Earth, it sometimes moves behind it and sometimes in front. As it also moves with the Earth around the Sun, it actually follows a constant pattern resembling the letter "S" in space. This route, traced by the Moon in space, is described in the Qur'an as resembling on old date branch and does resemble the twisted from of the date tree branch. The way this branch is described as "old" is also most appropriate since old date branches are thinner and more twisted.

There is no doubt that around fourteen centuries ago it was impossible for anyone to have any knowledge about the orbit of the Moon. The way that this pattern was revealed in the Qur'an is yet another scientific miracle of the Qur'an, the true book of Allah, the Creator of all things. He known best His creation.

Unit 1- Importance of Science

Worksheet 1

Tick ✓ the pictures given below that are scientific inventions.

Unit 1- Importance of Science

Worksheet 2

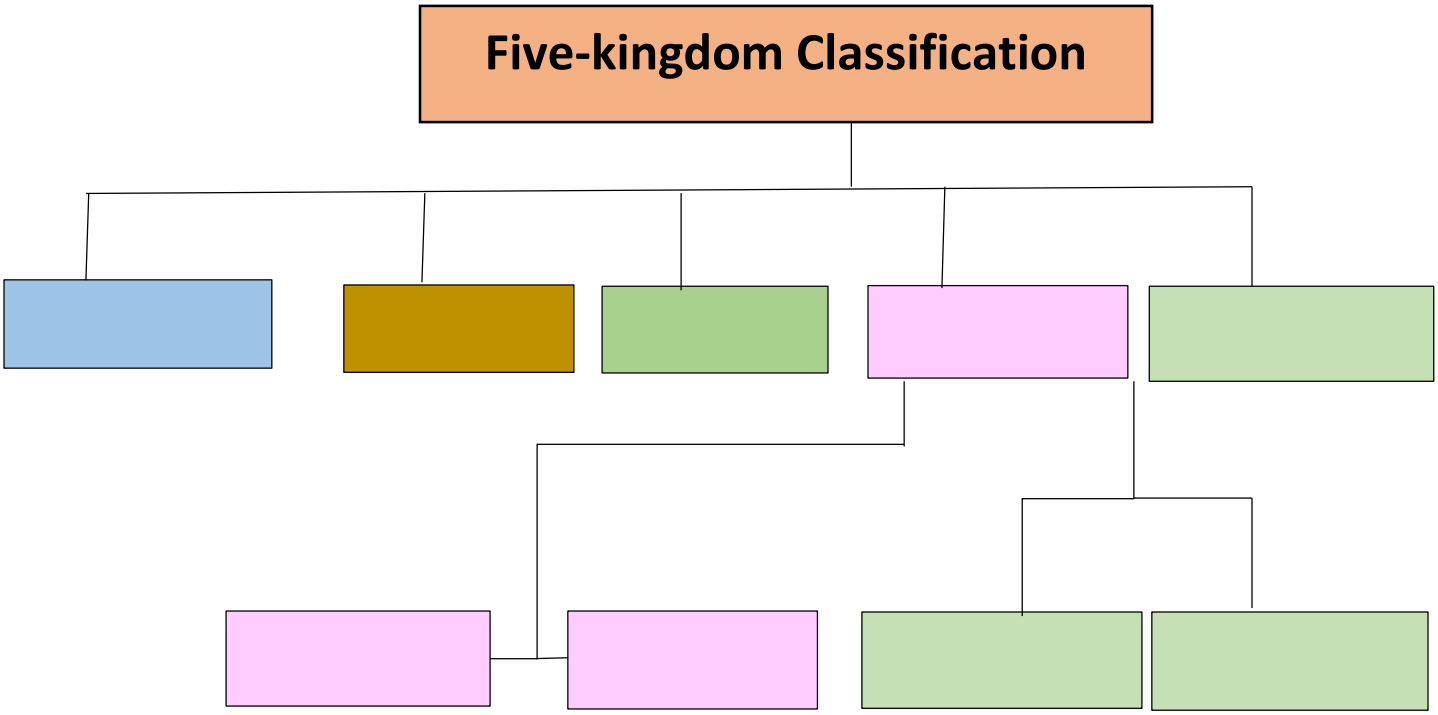
Choose the correct answer from the given options.

1. Science is the knowledge obtained from the study of:
    a. Atoms
    b. Solar system
    c. Structure of physical world.
2. The first completely synthetic plastic was made by chemist in the early:
    a. 1700
    b. 1800
    c. 1900
3. Biologists began developing high yield varieties of corn, wheat and rice in:
    a. 1740
    b. 1840
    c. 1940
4. The subjects of Akhirah is beyond the scope of science. _____ deals with such matters.
    a. Solar system
    b. Religion
    c. Science
5. Bait-al-Hikmah was a place of:
    a. Learning
    b. Praying
    c. Research

Unit 2- Classification of Living Things

Worksheet 3

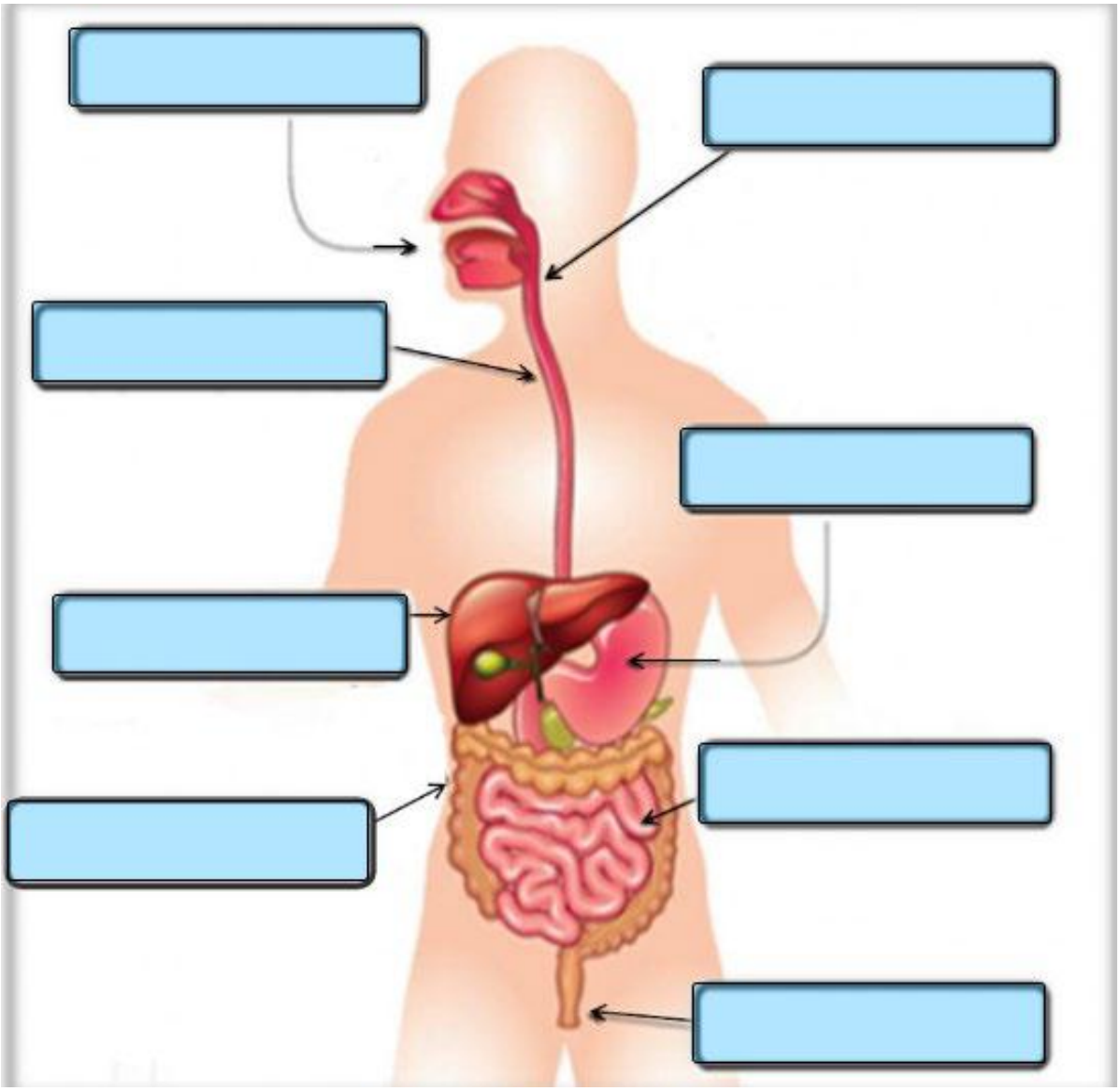
Complete the kingdom of classification.



Unit 3- Human Organ System

Worksheet 4

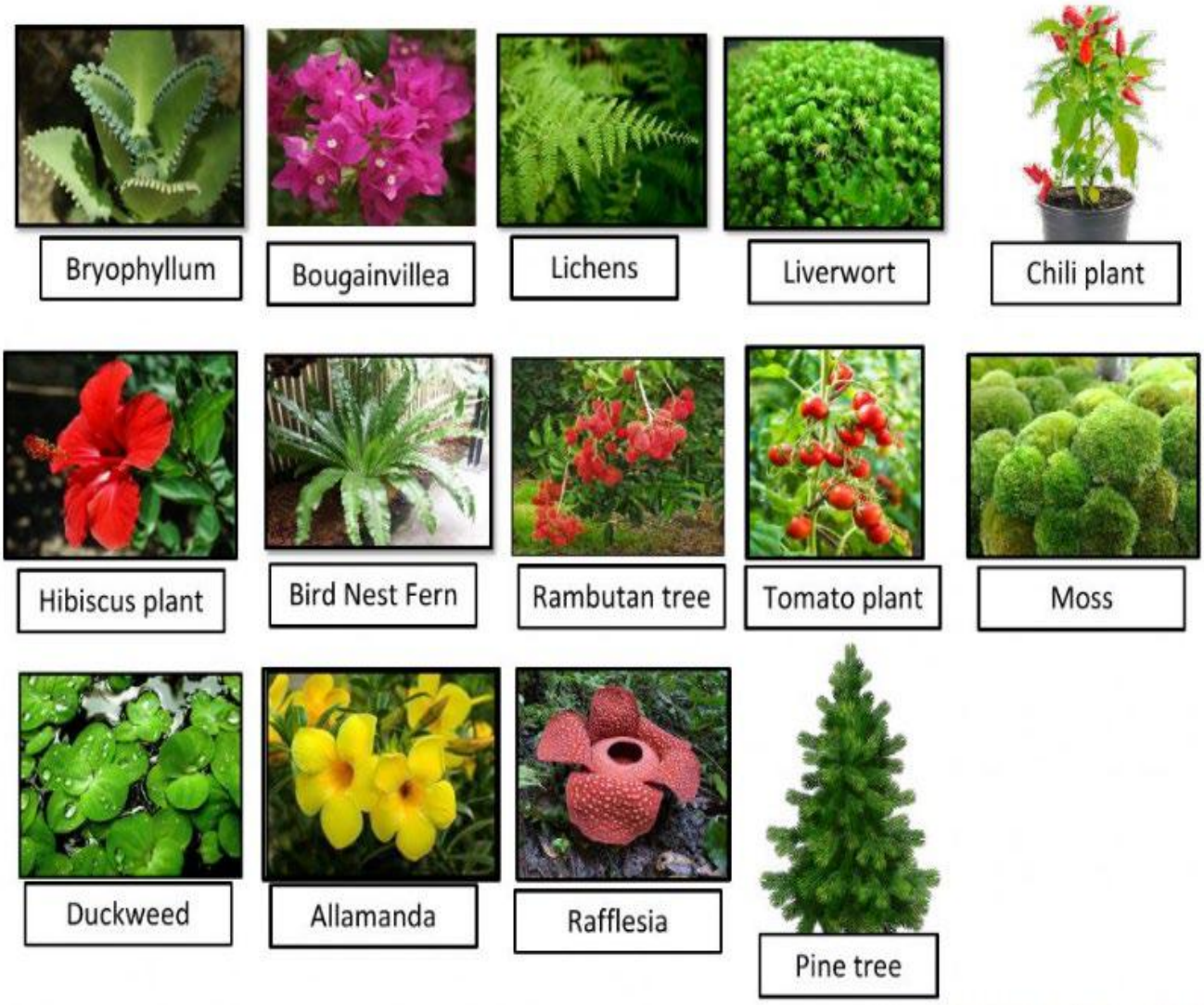
Label the each part of digestive system in the given picture.



Unit 4- Plant Structure

Worksheet 5

Enlist FP for Flowering Plant and NFP for Non-flowering plant.

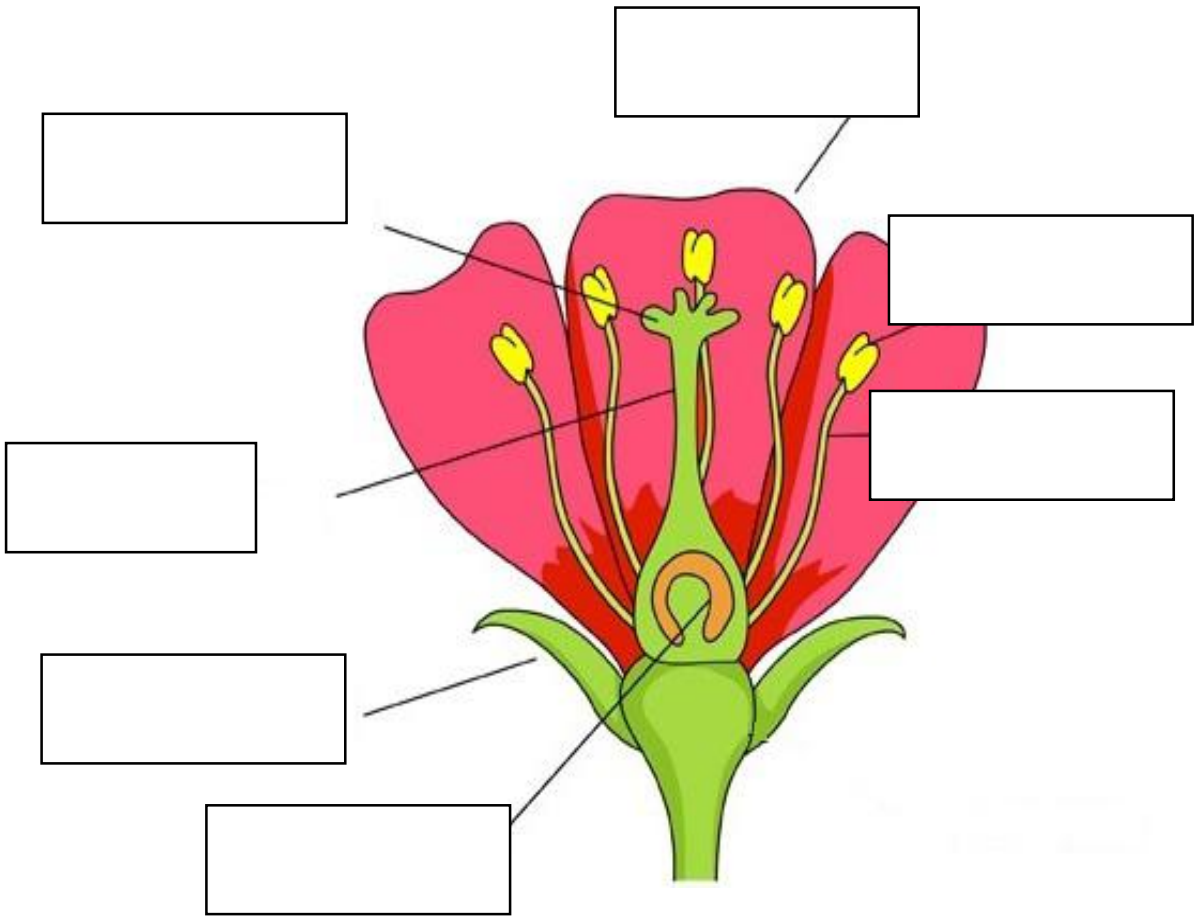


FP	
NFP	

Unit-5 Reproduction in Plants

Worksheet 6

Label the given diagram.



Unit-6 Introduction to Microorganisms

Worksheet 7

Write the names of diseases that spread because of these microorganisms.

		
Viruses	Bacteria	Fungi

Unit 7- Changes in the States of Matter

Worksheet 8

Identify the state of each material. Choose whether it is a solid, liquid or gas and write the answer in the given box.

ice

soy sauce

coffee

honey

sharpener

wind

car smoke

phone

oill

Unit 8 – Magnets and Electromagnets

Worksheet 9

Match column 'A' with column 'B'.

COLUMN A	COLUMN B
Magnet Compass	
Horse-shoe Magnet	
Ball shaped Magnet	
Cylindrical Magnet	
Bar Magnet	

Unit 9 – Forces on Earth

Worksheet 10

Identify and name the forces given in the pictures.

1._____ 5._____

2._____ 6._____

3._____ 7._____

4._____ 8._____

Unit 10 – Light and Shadow

Worksheet 11

Identify and match the objects as transparent, translucent and opaque.

TRANSLUCENT

TRANSPARENT

OPAQUE

Unit 11 – Simple Machines

Worksheet 12

Identify each everyday object and the simple machine associated with it.

Unit 12- Sound

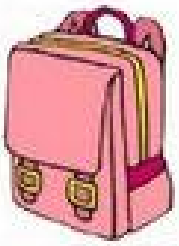
Worksheet 13

Look at the picture and write 'LS' for loud sound and 'SS' for soft sound.

Name:





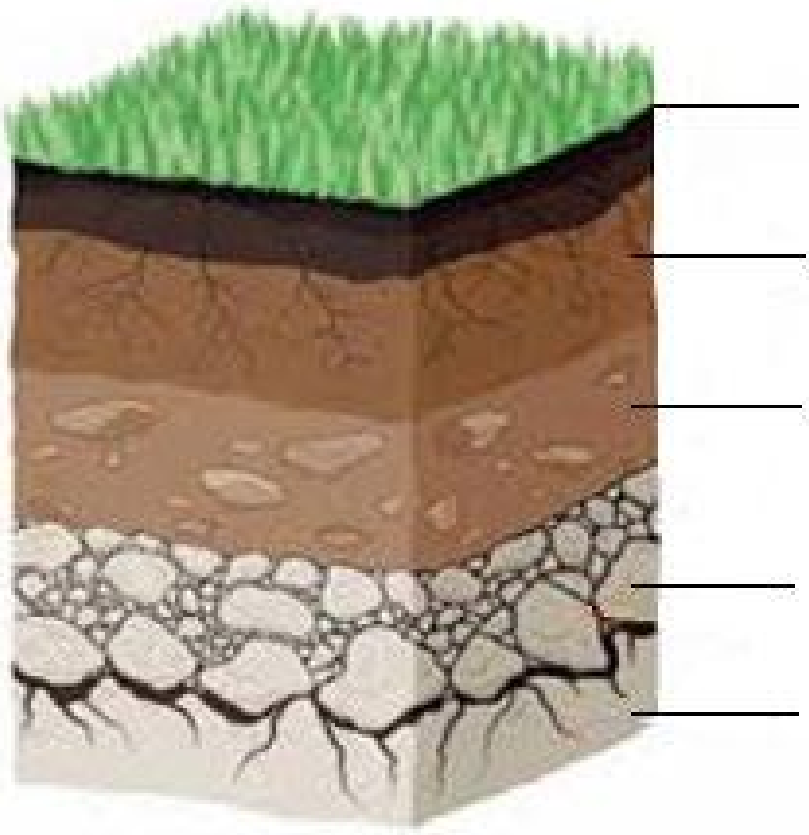






Unit 13- Soil and Soil Erosion

Worksheet 14

Label the layer of the soil.



Unit 14 – Air and Atmosphere

Worksheet 15

Write 'T' for true and 'F' for false statement.

i. **Oxygen is used by living things to breathe. _____**

ii. **Carbon dioxide is used by plants to make their food by photosynthesis. _____**

iii. **Air has a definite shape. _____**

iv. **Air does not have weight. _____**

v. **Air occupies space. _____**

vi. **Water vapours are responsible for snow, hail and fog. _____**

vii. **The percentage of carbon dioxide is 0.03%. _____**

viii. **Nitrogen and oxygen make up over 88% of the total weight of the air.**

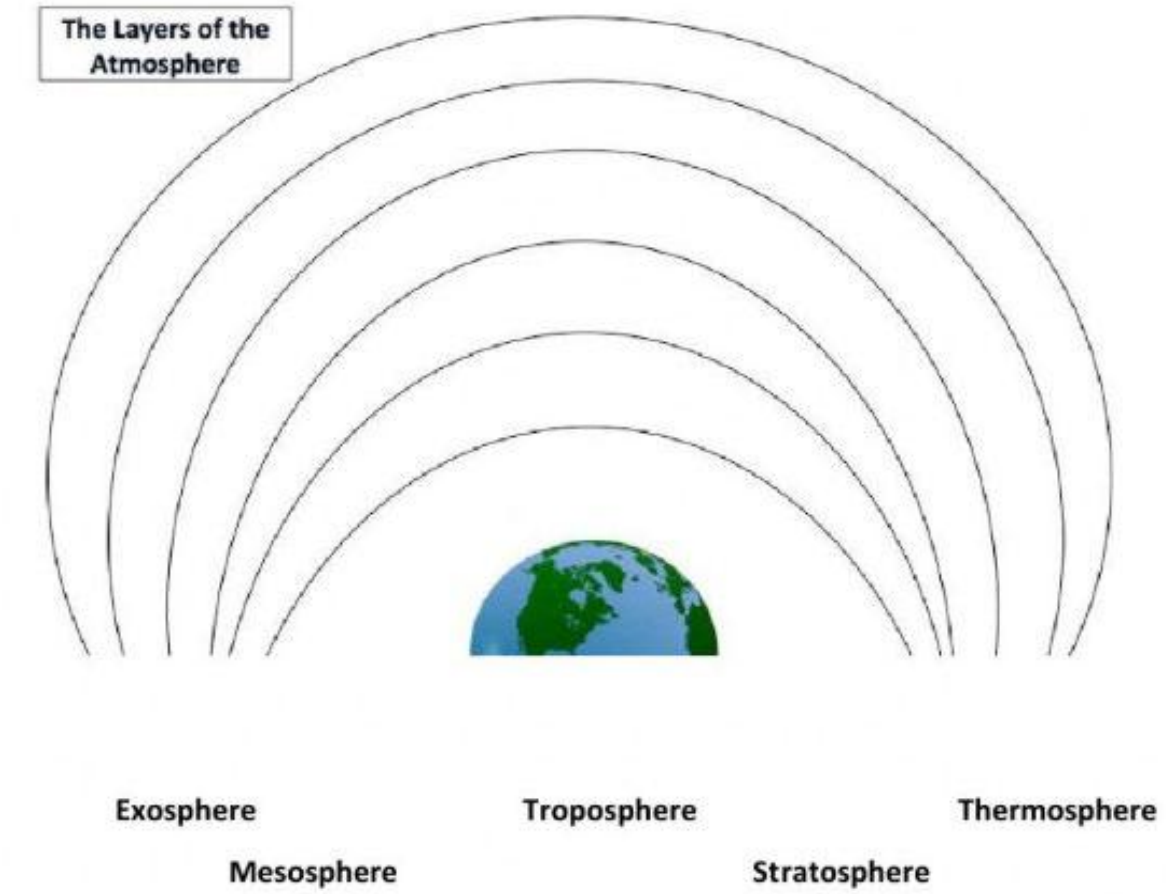
ix. **The percentage (%) of oxygen in air is 20.94. _____**

x. **Nitrogen gas supports burning. _____**

Unit 15 – Air and Atmosphere

Worksheet 16

Identify the layers of atmosphere.



Unit 16 – The Earth and Satellite

Worksheet 16

Choose the best answer.

i. **_____ is the closest heavenly body to the Earth.**

- a. **The Sun**
- b. **The Moon**
- c. **The Mars**

ii. **There are _____ phases of Moon.**

- a. **5**
- b. **8**
- c. **9**

iii. **_____ gravity keeps the Moon in its orbit.**

- a. **The Sun's**
- b. **The Moon's**
- c. **The Earth's**

iv. **_____Satellites are used to send radio, television and telephone signals throughout the world.**

- a. **Weather**
- b. **Communication**
- c. **Military**

v. **The Soviet Union launched the first satellite named Sputnik 1 in October _____.**

- a. **1947**
- b. **1956**
- c. **1957**

Unit-Assessments

Unit-1 Importance of Science

Name: _____ **Roll No:** _____ **Date:** _____

Time: 10 Minutes	**Total Marks:** /10

Fill in the blanks with correct words. **/4**

i. The first completely synthetic plastic was made by a chemist in the early_____.
a) 1800s b) 1900s

ii. In the late _____ Edward Jenner first convincingly showed that vaccination worked.
a) 1700s b) 1800s

iii. The House of Wisdom shows that the _____civilization always valued and Knowledge.
a) Muslim b) Hindu

iv. A biologist discovered the first antibiotic in the year _____.
a) 1920s b) 1930s

Question B

Tick ✓ the picture given below which are science inventions.

Question C

Answer the questions. **/2**

1. What does science study?

Answer: _____

2. What was Bait-ul-Hikmah?

Answer: _____

Unit-2 Classification of Living Things

Name: _____ **Roll No:** _____ **Date:** _____

Time: 10 Minutes	**Total Marks:** /10

Question A

Fill in the blanks with correct words. **/4**

i. All living things are generally classified into _____ main groups.
a) two b) three

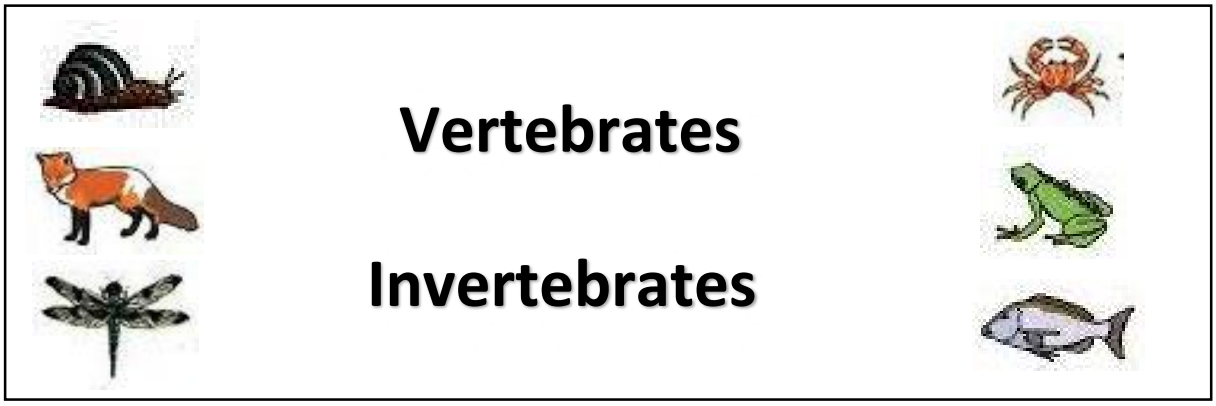
ii. Algae belong to kingdom _____.
a) fungi b) Protista

iii. Kingdom plantae is classified into _____ subgroups.
a. two b) three

iv. Worms are soft-bodied _____.
b) vertebrates b) invertebrates

Question B

Draw a line to match correct group. **/3**



Question C

Answer the questions. **/3**

1. What is kingdom Monera?

Answer: _____

2. Why are algae considered as plants?

Answer: _____

3. Name five kingdoms of organisms.

Answer: _____

Unit-3 Human Organ Systems

Name: _____ **Roll No:** _____ **Date:** _____

Time: 10 Minutes	**Total Marks:** /10

Question A

Fill in the blanks with correct words. **/4**

i. _____ system breaks down the food into tiny particles.
a) circulatory b) digestive

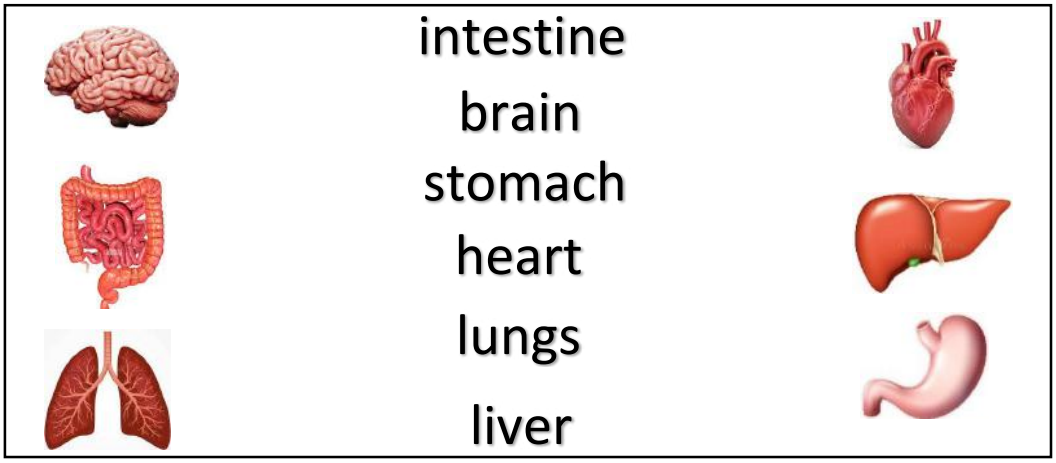
ii. _____ system consists of the heart, blood and a network of blood vessels.
a) circulatory b) digestive

iii. When we inhale, the _____ moves downward and the lungs expand with air.
a) alveoli b) diaphragm

iv. The _____ inside the backbone.
a) Spinal cord b) brain

Question B

Match the name of the human organ system. **/3**



Question C

Answer the questions. **/3**

1. What is the function of alveoli?

Answer: _____

2. What is the function of digestive system?

Answer: _____

3. Write the names of the types of muscles.

Answer: _____

Unit 4 Plant Structure

Name: _____ **Roll No:** _____ **Date:** _____

Time: 10 Minutes	**Total Marks:** /10

Question A

Write 'T' for true and 'F' for a false statement. **/4**

i. The plants are divided on the basis of the number of seeds.

ii. Stamens are the female reproductive system.

iii. Dicots leaves have veins running parallel to each other.

iv. The ovary is an enlarged and hollow part of

Question B

Match the given examples with their types of plants. **/3**

Monocots	Dicots
wheat	beans
tulip	grass
rose	oats

Question C

Answer the questions. **/3**

1. How are petals different from sepals?

Answer: _____

2. Describe flowers.

Answer: _____

Unit 5 Reproduction in Plants

Name: _____ **Roll No:** _____ **Date:** _____

Time: 10 Minutes	**Total Marks:** /10

Question A

Fill in the blanks with correct words. **/3**

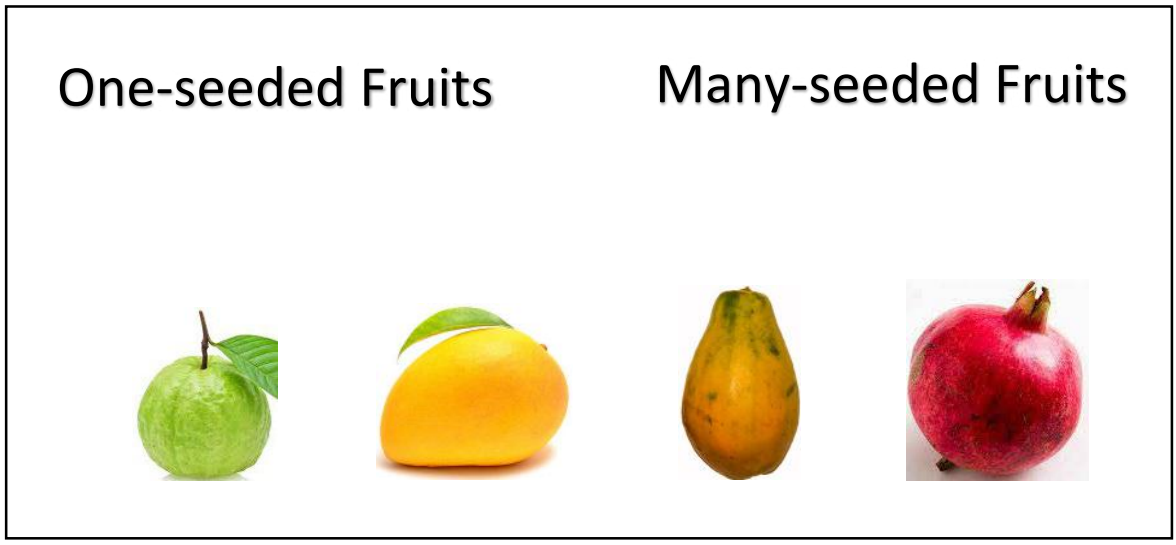
i. There are _____ types of pollination. (two, three)

ii. A process in which a seed needs favorable condition to grow into a new plant called _____. (fertilization, germination)

iii. _____ is the process by which seeds are carried away from the parent plant called. (dispersal, reproduction)

Question B

Match one-seeded and many-seeded fruits **/4**



Question C

Answer the questions. **/3**

1. What is germination?

Answer: _____

2. Define the term pollination.

Answer: _____

3. Define the term fertilization.

Answer: _____

Unit-6 Introduction to Microorganisms

Name: _____ **Roll No:** _____ **Date:** _____

Time: 10 Minutes	**Total Marks:** /10

Fill in the blanks with correct words. **/4**

v. _____ are plants without chlorophyll.
a) virus b) fungi

vi. _____ is a Latin word meaning slimy liquid.
c) Virus b) fungi

vii. Coronavirus disease COVID-19 emerged in China in December _____. .
b) 2019 b) 2020

viii. Influenza is caused by _____.
b) virus b) fungi

Question B **/3**

Tick ✓ for the correct statement and ✗ for the wrong statement.

i. Polluted water carries germs of many diseases, such as cholera and jaundice. _____

ii. Insects also spread diseases, such as typhoid and tetanus. _____

iii. The biological nature of viruses came from studies in 1982. _____

Question C
Answer the questions. **/3**

3. Define pathogens with an example.
Answer: _____

4. How do diseases spread?
Answer: _____

5. Define microorganisms.
Answer: _____

Unit-7 Changes in the States of Matter

Name: _____ **Roll No:** _____ **Date:** _____

Time: 10 Minutes	**Total Marks:** /10

Question A

Fill in the blanks with correct words. **/4**

v. _____ is the process in which solid changes into liquid on heating.
a) evaporation b) melting

vi. _____ is the process of water vapour turning back into liquid water.
a) evaporation b) condensation

vii. The process in which a gas changes directly to a solid without first becoming a liquid is called _____.
b. condensation b) deposition

viii. Irreversible changes are also called _____ change.
d) Physical b) chemical

Question B

Identify the process and write the answer. **/3**

i. **Gas** − **Energy lost** → **Solid** _____

ii. **Gas** − **Energy lost** → **Liquid** _____

iii. **Liquid** + **Energy lost** → **Solid** _____

Question C

Answer the questions. **/3**

4. Define deposition process with one example.

Answer: _____

5. Define the process of precipitation.

Answer: _____

6. Define sublimation process with one example.

Answer: _____

Unit-8 Magnets and Electromagnets

Name: _____ **Roll No:** _____ **Date:** _____

Time: 10 Minutes	**Total Marks:** /10

Question A

Fill in the blanks with correct words. **/4**

v. _____ is the power of a magnet to attract other objects.

a) repulsion b) magnetism

vi. The area around a magnet within which it attracts magnetic materials is known as its _____.

a) magnetism b) magnetic field

vii. _____ are also called permanent magnet.

b) soft b) hard

viii. materials which lose their magnetism easily are also called _____ magnets.

b) Permanent b) temporary

Question B

Tick ✓ for the materials which attracts towards the magnets and which do not attracts towards the magnets. **/3**

i.  _____

ii.  _____

iii.  _____

Question C

Answer the questions. **/3**

4. Define magnetic field.

Answer: _____

5. What is magnetic compass? Write its one uses.

Answer: _____

6. Why are electromagnets known as temporary magnets?

Answer: _____

Unit 9 Forces on Earth

Name: _____ **Roll No:** _____ **Date:** _____

Time: 10 Minutes	**Total Marks:** /10

Question A

Write 'T' for true and 'F' for a false statement. **/4**

v. Mass is the total amount of matter in an object.

vi. Weight is the force of gravity on an object.

vii. We need elastic force to walk and drive vehicles.

viii. Frictional force depends upon gravitational force.

Question B

Match the picture with the correct force. **/3**

Question C

Answer the questions. **/3**

3. Define elastic force.

Answer: _____

4. What is inertia?

Answer: _____

5. Define balance forces.

Answer: _____

Unit 10 Light and Shadow

Name: _____ **Roll No:** _____ **Date:** _____

Time: 10 Minutes	**Total Marks:** /10

Question A

Fill in the blanks with correct words. **/3**

iv. _____ materials do not allow light to pass through it. (translucent, opaque)

v. A number of light rays make up a _____ of light. (beam, ray)

vi. Moon and stars are the _____ source of light. (naturel, artificial)

Question B

Tick ✓ the items which allow light to pass through them and cross ⊗ the ones which do not allow the light to pass through them. **/4**

_____

_____

_____

_____

Question C

Answer the questions. **/3**

4. Which things are needed for the formation of a shadow?

Answer: _____

5. How can we see without sunlight?

Answer: _____

6. "Light travel in a straight line." Justify this statement.

Answer: _____

Unit-11 Simple Machines

Name: _____ **Roll No:** _____ **Date:** _____

Time: 10 Minutes	**Total Marks:** /10

Fill in the blanks with correct words. **/4**

ix. _____ is a simple machine that is used for lifting and moving heavy things with little efforts..

a) lever b) fulcrum

x. The _____ is the weight of eh object to be moved.

e) effort b) load

xi. there are _____ types of levers.

c) 3 b) 4

xii. A _____ is an inclined plane wrapped around a cylinder.

c) wedge b) screw

Question B **/3**

Tick ✓ for the correct statement and ✗ for the wrong statement.

iv. A lever is a bar which can rotate about a fixed point. _____

v. A screw is used to hold things together. _____

vi. A seesaw is a class one lever. _____

Question C

Answer the questions. **/3**

6. Differentiate between an inclined plane and a wedge.

Answer: _____

7. How does a pulley work? Also, name its type.

Answer: _____

8. Describe the three classes of lever.

Answer: _____

Unit-12 Sound

Name: _____ **Roll No:** _____ **Date:** _____

Time: 10 Minutes	**Total Marks:** /10

Question A

Fill in the blanks with correct words. **/4**

ix. Echoes are sounds reflected from _____ surfaces.

a) soft b) hard

x. The sound waves spread out in _____.

a) circles b) up and down

xi. _____ is defined as an unwanted, unpleasant or loud sound.

c. Noise b) echoes

xii. _____ travels through different mediums at different speeds.

f) sound b) echo

Question B

Match the frequency range of hearing of the given animals. **/3**

iv. **bat**  **70 Hz – 3,300 Hz**

v. **cat**  **60 Hz – 130,000 Hz**

vi. **fish**  **60 Hz – 65,000 Hz**

Question C

Answer the questions. **/3**

7. What is vacuum? Explain why a sound cannot travel in a vacuum.

Answer: _____

8. How are echoes produced?

Answer: _____

9. Define the term frequency.

Answer: _____

Unit-13 Soil and Soil Erosion

Name: _____ **Roll No:** _____ **Date:** _____

Time: 10 Minutes	**Total Marks:** /10

Question A

Fill in the blanks with correct words. **/4**

ix. The layer under topsoil is called _____.

a) Parent Material b) Subsoil

x. The protection of soil from erosion is called soil _____.

a) conservation b) reforestation

xi. _____ is the last and the deepest layer of the soil.

c) subsoil b) bedrock

xii. Cutting trees on a massive scale is called _____

c) reforestation b) deforestation

Question B

Tick ✓ for the correct answer and ⊗ for the wrong answer. **/3**

iv. topsoil is darkbrown in color. _____

v. Reforestation is a way to prevent soil erosion. _____

vi. Floods and heavy rains prevent soil erosion. _____

Question C

Answer the questions. **/3**

7. Describe soil erosion and its causes.

Answer: _____

8. What are the effects of soil erosion?

Answer: _____

9. Describe the conservation of soil.

Answer: _____

Unit 14 Air and Atmosphere

Name: _____ **Roll No:** _____ **Date:** _____

Time: 10 Minutes	**Total Marks:** /10

Question A

Write 'T' for true and 'F' for a false statement. **/4**

ix. The most abundant gas in the air is carbon dioxide. _____

x. The ozone layer is present in the Troposphere. _____

xi. The mesosphere is the third layer. _____

xii. Thermosphere extends up to 513kilometres above the surface of the Earth. _____

Question B

Match the column 'A' with column 'B'. **/3**

Column A	Column B
Troposphere	**50 kilometres**
Stratosphere	**85 kilometres**
Mesosphere	**10 to 12 kilometres**

Question C

Answer the questions. **/3**

6. Write down the composition of air.

Answer: _____

7. What do you mean by ozone depletion?

Answer: _____

8. "Air has weight." Prove the statement.

Answer: _____

Unit 15 Environmental Pollution

Name: _____ **Roll No:** _____ **Date:** _____

Time: 10 Minutes	**Total Marks:** /10

Question A
Fill in the blanks with correct words. **/3**

vii. The harmful substances that adversely affect the environment are called _____.
(Pollution, Pollutants)

viii. _____ pollution occurs when people throw garbage onto the ground. (air, land)

ix. There are _____ kinds of pollution. (four, three)

Question B
Tick ✓ for the right statement and ⊗ for the wrong statement. **/4**

i. Land polllution is the degradatin of the Earth's land surface. _____

ii. About 81 per cent of our Earth's surface is covered with water. _____

iii. There are two types of pullutants. _____

iv. Acid rain cannot damege forest habitats as well as aquatic life. _____

Question C
Answer the questions. **/3**

7. Define the kinds of pollution with one example.

Answer: _____

8. What are the effects of land pollution?

Answer: _____

9. Define the term 'Biodegradable pollutants'.

Answer: _____

Unit-16 The Earth and Satellites

Name: _____ **Roll No:** _____ **Date:** _____

Time: 10 Minutes	**Total Marks:** /10

Question A

Fill in the blanks with correct words. **/4**

i. The solid layer which is the very center of the Earth. _____.
   a) core b) outer core

ii. The Moon has a very thin and weak atmosphere, called a/an _____.
   a) endosphere b) exosphere

iii. The Moon's gravitational force is _____ of the Earth's.
   d) one-fifth b) one- sixth

iv. The _____ is the closest heavenly body to the Earth.
   d) Uranus b) Moon

Question B

Tick ✓ for the correct answer and ⊗ for the wrong answer. **/3**

i. Changes in shpe are called phases of the Moon. _____

ii. Below the mantle is a layer mostly of metals called the Outer Core. _____

iii. U.S. A. launched the first satellite in October 1957. _____

Question C

Answer the questions. **/3**

1. Describe the structure of the Earth.

Answer: _____

2. What do you know about the Moon's atmosphere?

Answer: _____

3. Write any three uses of artificial satellite.

Answer: _____

Terminal Assessment Paper

First Term

1st Term Assessment **Time: 60 Minutes**

SCIENCE 5

Name: _____ **Roll No:** _____ **Date:** _____

Section	Section-I	Section-II	Total
Maximum Marks	**50**	**10**	**60**
Obtained Marks			

Section-I

Question 1

Fill in the blanks with correct word. **/07**

i. Bait-ul-Hikmah was a place of learning in the _____ world. (Chinese, Muslim)

ii. _____knowledge is not absolute; it is tentative and subject to change. (general, Scientific)

iii. _____ do not have chlorophyll. (algae, fungi)

iv. Ants and flies are common examples of _____. (echinoderms, insects)

v. The sepals are collectively called the _____. (calyx, anther)

vi. Wheat is a _____ plant. (Dicot, monocot)

vii. Pollen grains are the _____ cells of the flower. (male, female)

Question 2

Write 'T' for true and 'F' for false statement. **/08**

i. The sweet potato plant develops from buds on old stems.

ii. Dandelion seeds are carried away by wind.

iii. Some fruits, such as peach and mango have many seeds.

iv. The ovary produces pollen grains.

v. The floral leaves of monocots are in multiple of three.

vi. Digestive system deals with breathing.

vii. Flowering plants are also called angiosperms.

viii. The term biodiversity was given by Walter G. Rosen in the year 1986.

Question 3

Enlist the names of five main Kingdom. **/05**

1. _____ 3. _____ 5. _____

2. _____ 4. _____

Question 3

Match the column A with column B. **/10**

Column A		**Column B**
Pomegranate		*Flowering plant*
Butterfly		*Cardiac muscles*
Tulip		*Many-seeded fruit*
Fern		*Scientific invention*
Mono		*insect*
Heart		*Non-Flowering plant*
Aero plane		*One*
Peas		*Skeletal Muscles*
Limbs (arms, legs)		*Dicots*
Star fish		*Invertebrates*

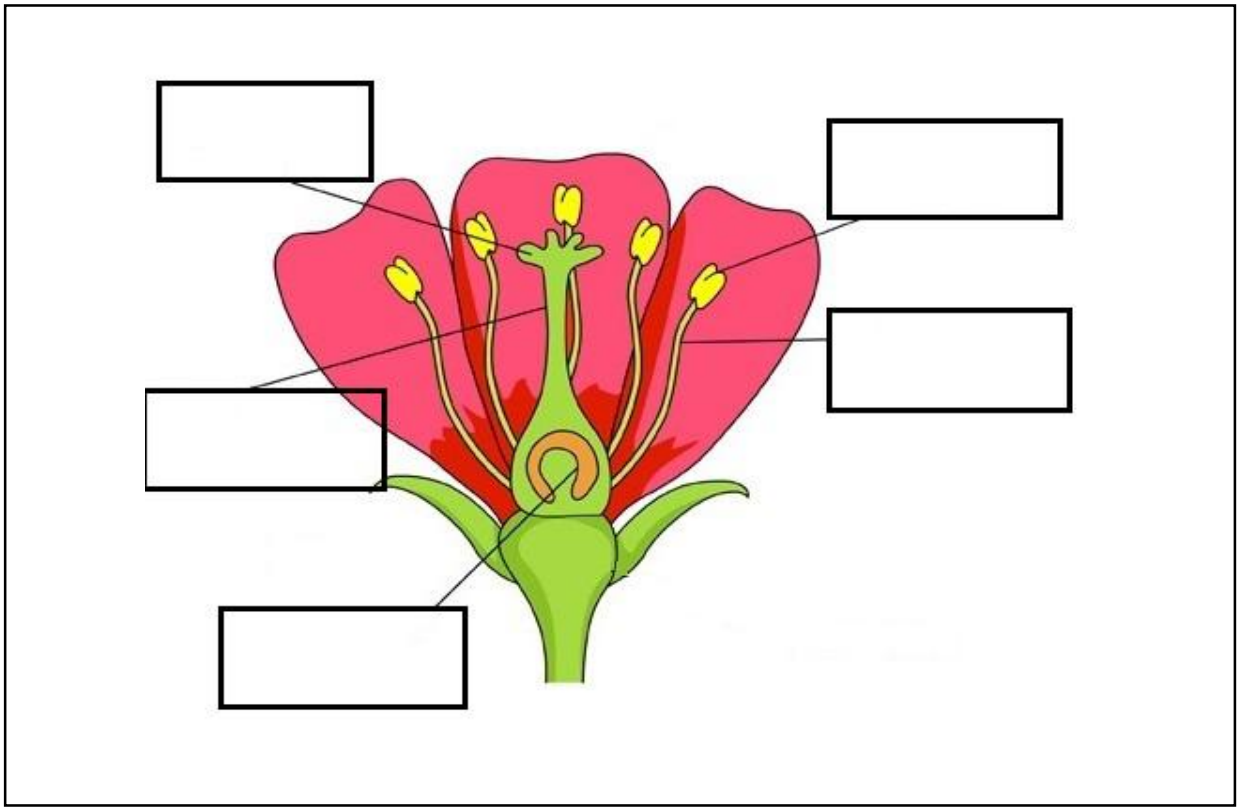
Question 4

Write the names of five vertebrates and five invertebrates. **/05**

i. _____ **vi.** _____
ii. _____ **vii.** _____
iii. _____ **viii.** _____
iv. _____ **ix.** _____
v. _____ **x.** _____

Question 5 **/05**

Label the given diagram:



Question 6 **/05**

What lesson do we learn from The Bait-al-Hikmah? Describe briefly.

Answer:

_____
_____
_____
_____
_____
_____
_____
_____

Question 7 **/05**

Write two structural differences between Monocots and Dicots.

Answer:

_____
_____
_____
_____
_____
_____
_____
_____

Section-II

Question 8

Answer the questions. **/10**

1. **What is the function of medulla in brain?**

Answer:

_____

2. **How are petals different from sepals?**
   Answer:

   _____

3. **Name any four dicot plants.**
   Answer:

   _____

4. **Describe the different stages of seed germination?**
   Answer:

   _____

5. **How do animals and birds help in seed dispersal?**

Answer:

_____

6. **What are the key features of kingdom fungi?**

Answer:

_____

7. **How is biodiversity being lost?**

Answer:

_____

8. **How science is deeply connected with our daily lives? Give two examples.**

Answer:

_____

9. **What the musculoskeletal system?**

Answer:

_____

10. **What is Bait-al-Hikmah?**

Answer:

_____

Terminal Assessment Paper

Second Term

2rd Term Assessment **Time: 60 Minutes**

SCIENCE 5

Name: _____ **Roll No:** _____ **Date:** _____

Section	Section-I	Section-II	Total
Maximum Marks	**50**	**10**	**60**
Obtained Marks			

Section-I

Question 1

Fill in the blanks with correct word. **/07**

i. A Muslim Scientist _____ inverted the pinhole camera. (Charles-Augustin de Coulomb, Ibn Al-Haytham)

ii. _____was the first scientist who discovered the forces of gravity. (Einstein, Isaac Newton)

iii. _____ force attracts everything towards the centre of the Earth. (elastic, gravitational)

iv. _____ was a Frenchman who discovered the magnetic field. (Charles-Augustin de Coulomb, Ibn Al-Haytham)

v. Chemical changes are also called _____ change. (reversible, irreversible)

vi. _____ is the process in which a liquid change into vapours. (condensation, evaporation)

vii. The biological nature of viruses came from studies in _____. (1882,1892)

Question 2

Write 'T' for true and 'F' for false statement. **/08**

i. Virus is a Latin word meaning slimy liquid or poison.

ii. The athlete's foot is a viral disease.

iii. The process in which rainwater sinks into the soil is called infiltration.

iv. The burning of a piece of wood is a physical change.

v. Electromagnets are natural magnets.

vi. The magnetic field can be detected by a magnetic compass.

vii. Inertia is important to move or stop an object.
viii. Wood is a translucent material.

Question 3

Enlist two transparent and two opaque material. **/05**

1. Transparent Material.

i. _____

ii. _____

2. Opaque Material.

i. _____

ii. _____

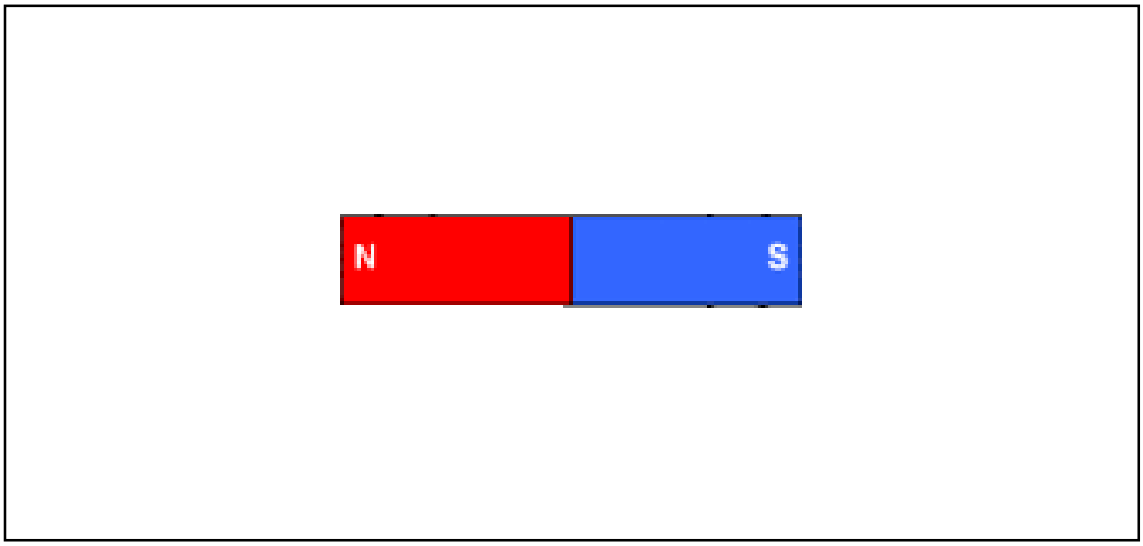
Question 3

Match the column A with column B. **/10**

COLUMN A	COLUMN B
         	**TRANSLUCENT MATERIAL** **OPAQUE MATERIAL** **TRANSPARENT MATERIAL**

Question 5 **/05**

Draw the pattern of the magnetic field lines around the bar magnet given below.



Question 4

Complete the equations for the following processes. **/05**

Melting: ☐ + Energy absorbed → Liquid

Condensation: Liquid + Energy absorbed → ☐

Evaporation: Solid + ☐ → Gas

Sublimation ☐ − Energy lost → Solid

Freezing Gas − Energy lost → ☐

Question 5 **/05**

Discuss the Hadith number 5728 of Sahih Bukhari with reference to the concept of spread of diseases.

Answer:

_____
_____
_____
_____
_____
_____
_____
_____

Question 6 **/05**

Define the following processes:

i. **Precipitation**
ii. **Freezing**

Answer:

_____
_____
_____
_____
_____
_____
_____
_____

Section-II

Question 7
Answer the questions. /10

1. How can you differentiate between hard and soft magnetic materials? Give one examples of each.
Answer:

_____

2. Why are electromagnets known as temporary magnets?
Answer:

_____

3. What is the difference between mass and weight?
Answer:

_____

4. Define an elastic force and a muscular force.
Answer:

_____

5. How does the length of a shadow depend on the position of the source of light?

Answer:

_____

6. Explain the structure and working of a pinhole camera.

Answer:

_____

7. Explain eh stages of evaporation and condensation in the water cycle.

Answer:

_____

8. Discuss the types of changes in matter. Give two examples of each change.

Answer:

_____

9. What are the main advantages of microorganisms?

Answer:

_____

10. How do disease spread?

Answer:

_____

Terminal Assessment Paper

Third Term

3rd Term Assessment **Time: 60 Minutes**

SCIENCE 5

Name: _____ **Roll No:** _____ **Date:** _____

Section	Section-I	Section-II	Total
Maximum Marks	**50**	**10**	**60**
Obtained Marks			

Section-I

Question 1

Fill in the blanks with correct word. **/07**

i. A Muslim Scientist _____ inverted the pinhole camera. (Charles-Augustin de Coulomb, Ibn Al-Haytham)

ii. The atmosphere is divided in _____ layers. (seven, five)

iii. The mesosphere is the _____ layer of the atmosphere. (third, fourth)

iv. Pollutants that decompose naturally are called _____. (non-biodegradable, biodegradable)

v. The Moon takes _____ days to orbit the Earth once. (37, 27)

vi. Parent material consists of _____. (topsoil, broken rocks)

vii. The sound waves spread out in _____. (circles, up and down)

Question 2

Write 'T' for true and 'F' for false statement. **/08**

i. Human ears can hear sounds ranging from 20 Hz to 20,000 Hz. _____

ii. Submarine use the sonar to send out sound waves to find the location. _____

iii. The fixed point about which the lover rotates is called effort. _____

iv. The number of vibrations produces in one second is called the sound. _____

v. The sound is measured in Hertz (Hz). _____

vi. Due to the presence of humus, the topsoil is dark brown in color. _____

vii. Strong winds cannot cause soil erosion. _____

viii. The stratosphere is the second layer of the atmosphere. _____

Question 3

Enlist three names of the layers of atmosphere **/05**

iii. _____

iv. _____

v. _____

vi. _____

vii. _____

Question 3

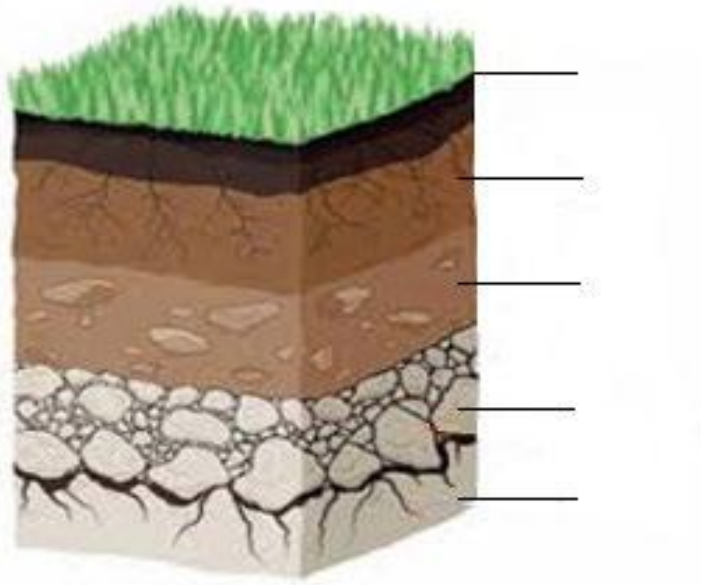
Match the picture with soft and loud sounds. **/10**

Soft Sound

Loud Sound

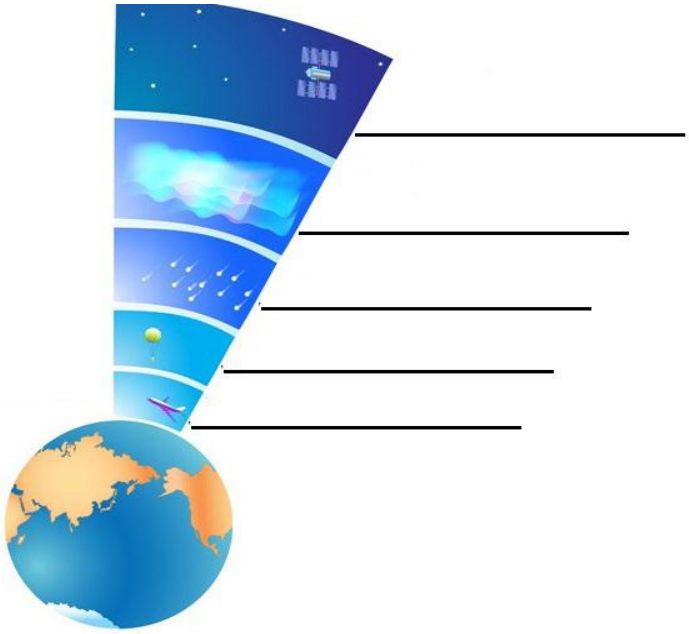
Question 4

Label the layer of the soil. /05



Question 5

Label the layer of the atmosphere. /05



Question 6 **/05**

Discuss the Ayah number 39 of Sahih Ya-Seen of the Holy Qur'an in relation to the way the Moon revolves around the Earth.

Answer:

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Question 7 **/05**

Write a short note on "The role of NASA in space exploration".

Answer:

_____
_____
_____
_____
_____
_____
_____
_____
_____

Section-II

Question 8

Answer the questions. /10

1. **Why is the subsoil important for the growth of plants?**

Answer:

_____

2. **Why is the atmosphere important?**

Answer:

_____

3. **Explain the effects of Moon's gravity on Earth.**

Answer:

_____

4. **Explain how deforestation gives rise to soil erosion.**

Answer:

_____

5. **Define the term 'Natural Satellite'.**

Answer:

_____

6. **What are the causes of land pollution?**

Answer:

_____

7. **"Air has weight and occupies space'. Prove the statement.**

Answer:

_____

8. **Describe the conservation of soil.**

Answer:

_____

9. **Explain how deforestation gives rise to soil erosion.**

Answer:

_____

10. **How high-frequency and low-frequency are sounds produced?**

Answer:

_____