MATH LOVE INSTITUTE

Annual Examination 2025-26

Class: VIII | Subject: Science (SET - 1)

Time: 3 Hours | Maximum Marks: 80

Student Name:	_____
Roll Number:	_____
Date:	_____

General Instructions:

1. All questions are compulsory.
2. The question paper is divided into 5 sections: A, B, C, D, and E.
3. Section A: Multiple Choice Questions (1 mark each) – 15 marks
4. Section B: Fill in the Blanks / True-False (1 mark each) – 15 marks
5. Section C: Short Answer Questions (2 marks each) – 20 marks
6. Section D: Long Answer Questions (3 marks each) – 15 marks
7. Section E: Diagram Based / Case Based Questions (3 marks each) – 15 marks
8. Write neatly and legibly. Marks may be deducted for illegible handwriting.
9. Read each question carefully before attempting.

SECTION A – MULTIPLE CHOICE QUESTIONS (15 × 1 = 15 Marks)

Q1. Which microorganism is used in making curd from milk? **[1 Mark]**

(a) Virus

(b) Bacteria

(c) Fungi

(d) Protozoa

Q2. The process of conversion of sugar into alcohol is called: **[1 Mark]**

(a) Fermentation

(b) Nitrogen fixation

(c) Pasteurization

(d) Condensation

Q3. Which of the following is a synthetic fibre? **[1 Mark]**

(a) Cotton

(b) Wool

(c) Polyester

(d) Silk

Q4. Which metal is the best conductor of electricity? **[1 Mark]**

(a) Copper

(b) Silver

(c) Gold

(d) Aluminum

Q5. The SI unit of force is: **[1 Mark]**

(a) Pascal

(b) Newton

(c) Joule

(d) Watt

Q6. Friction can be reduced by: **[1 Mark]**

(a) Polishing surfaces

(b) Using lubricants

(c) Using ball bearings

(d) All of the above

Q7. The loudness of sound is measured in: **[1 Mark]**

(a) Hertz

(b) Decibel

(c) Joule

(d) Watt

Q8. What happens when current flows through a wire? **[1 Mark]**

(a) It gets cold

(b) It produces heat

(c) It becomes magnetic

(d) Both (b) and (c)

Q9. The image formed by a plane mirror is: **[1 Mark]**

(a) Real and inverted

(b) Virtual and erect

(c) Real and erect

(d) Virtual and inverted

Q10. Which gas is produced during photosynthesis? **[1 Mark]**

(a) Carbon dioxide

(b) Nitrogen

(c) Oxygen

(d) Hydrogen

Q11. Puberty is the age at which: **[1 Mark]**

(a) Children become adults

(b) Reproductive organs mature

(c) Growth stops

(d) Mental development starts

Q12. Which fossil fuel is formed from the remains of plants? **[1 Mark]**

(a) Petroleum

(b) Natural gas

(c) Coal

(d) All of these

Q13. The atmospheric pressure is measured by: **[1 Mark]**

(a) Barometer

(b) Thermometer

(c) Manometer

(d) Hygrometer

Q14. Deforestation causes: **[1 Mark]**

(a) Increase in rainfall

(b) Soil erosion

(c) More oxygen in atmosphere

(d) Decrease in temperature

Q15. Which planet is known as the Red Planet? **[1 Mark]**

(a) Venus

(b) Mars

(c) Jupiter

(d) Saturn

SECTION B – FILL IN THE BLANKS / TRUE-FALSE (15 × 1 = 15 Marks)

Q16. Fill in the Blank: **[1 Mark]**

The smallest unit of life is called a _____.

Q17. Fill in the Blank: **[1 Mark]**

_____ is the powerhouse of the cell.

Q18. Fill in the Blank: **[1 Mark]**

The process by which plants make their food is called _____.

Q19. Fill in the Blank: **[1 Mark]**

Metals that can be drawn into wires are said to be _____.

Q20. Fill in the Blank: **[1 Mark]**

The substance that burns in the presence of oxygen to produce heat and light is called _____.

Q21. True or False: **[1 Mark]**

Friction is a force that opposes motion.

Q22. True or False: **[1 Mark]**

Sound can travel through vacuum.

Q23. True or False: **[1 Mark]**

An electric bell works on the principle of electromagnetism.

Q24. Fill in the Blank: **[1 Mark]**

The eye disease caused by deficiency of Vitamin A is called _____.

Q25. Fill in the Blank: **[1 Mark]**

The process of separation of grain from chaff is called _____.

Q26. True or False: **[1 Mark]**

Malaria is caused by a virus.

Q27. True or False: **[1 Mark]**

Plastics are biodegradable materials.

Q28. Fill in the Blank: **[1 Mark]**

The measure of how hot or cold an object is called _____.

Q29. Fill in the Blank: **[1 Mark]**

A cyclone is a region of _____ pressure.

Q30. True or False: **[1 Mark]**

The ozone layer protects us from harmful ultraviolet rays of the sun.

SECTION C – SHORT ANSWER QUESTIONS (10 × 2 = 20 Marks)

Q31. What are microorganisms? Name two useful microorganisms. **[2 Marks]**

Q32. Differentiate between Kharif and Rabi crops with one example each. **[2 Marks]**

Q33. What is the difference between metals and non-metals? Give two points. **[2 Marks]**

Q34. What is friction? State whether it is useful or harmful with one example of each. **[2 Marks]**

Q35. Define pressure. Give its SI unit. **[2 Marks]**

Q36. What are the characteristics of sound? **[2 Marks]**

Q37. Why do we need to conserve forests and wildlife? **[2 Marks]**

Q38. What is adolescence? Name two changes that occur during adolescence. **[2 Marks]**

Q39. What is the role of chlorophyll in photosynthesis? **[2 Marks]**

Q40. Why is it difficult to walk on a slippery road? **[2 Marks]**

SECTION D – LONG ANSWER QUESTIONS (5 × 3 = 15 Marks)

Q41. Explain the process of combustion. Name three types of combustion with examples. **[3 Marks]**

Q42. Describe the structure of a cell with the help of a neat labeled diagram. **[3 Marks]**

Q43. What is an electromagnet? How is it different from a permanent magnet? Give one use of electromagnet. **[3 Marks]**

Q44. Explain how sound is produced and how it travels through different media. **[3 Marks]**

Q45. What is the nitrogen cycle? Explain its importance with a diagram. **[3 Marks]**

SECTION E – DIAGRAM BASED / CASE BASED QUESTIONS (5 × 3 = 15 Marks)

Q46. Diagram Based Question: **[3 Marks]**

Draw a labeled diagram of the human eye and explain the function of any three parts.

Q47. Case Study – Conservation of Forests **[3 Marks]**

Forests play a crucial role in maintaining the ecological balance. They provide habitat to wildlife, prevent soil erosion, maintain water cycle, and help in reducing air pollution. However, due to increasing human activities like agriculture, urbanization, and industrialization, forests are being destroyed at an alarming rate. This leads to loss of biodiversity, climate change, and natural disasters.

Based on the above passage, answer the following:
(i) List two benefits of forests. (1 mark)
(ii) What are the main causes of deforestation? (1 mark)
(iii) Suggest two measures to conserve forests. (1 mark)

Q48. Case Study – Microorganisms in Agriculture **[3 Marks]**

Microorganisms play an important role in agriculture. Some bacteria like Rhizobium live in the root nodules of leguminous plants and help in nitrogen fixation. This increases the fertility of soil naturally. Blue-green algae also fix atmospheric nitrogen in paddy fields. Decomposers like bacteria and fungi break down dead organic matter and return nutrients to the soil.

Based on the above passage, answer the following:
(i) Which microorganism helps in nitrogen fixation in leguminous plants? (1 mark)
(ii) How do decomposers help farmers? (1 mark)
(iii) Why is nitrogen fixation important for plants? (1 mark)

Q49. Case Study – Force and Pressure **[3 Marks]**

Ram noticed that when he pushes a lighter box, it moves easily. But when he pushes a heavier box with the same force, it moves slowly or does not move at all. His science teacher explained that this happens because of friction and inertia. She also told him that pressure depends on the area over which force is applied. That's why a sharp knife cuts vegetables easily but a blunt knife doesn't.

Based on the above passage, answer the following:
(i) Why does the heavier box not move easily? (1 mark)
(ii) What is the relation between force, pressure, and area? (1 mark)
(iii) Why does a sharp knife cut better than a blunt knife? (1 mark)

Q50. Practical Based Question: **[3 Marks]**
Draw a neat labeled diagram showing the setup of an electric circuit containing a cell, a bulb, a switch, and connecting wires. Explain what happens when the switch is ON and when it is OFF.

✓ COMPLETE ANSWER KEY WITH DETAILED SOLUTIONS

This section contains comprehensive answers with marking schemes for all questions. Study thoroughly to understand concepts and scoring patterns.

SECTION A ANSWERS – MULTIPLE CHOICE QUESTIONS

Q1. Answer: (b) Bacteria

Lactobacillus bacteria convert milk into curd through the process of fermentation. These bacteria produce lactic acid which converts milk protein into curd.

1 mark for correct option

Q2. Answer: (a) Fermentation

Fermentation is the process by which microorganisms (especially yeast) convert sugar into alcohol and carbon dioxide in the absence of oxygen. This process is used in making alcoholic beverages and bread.

1 mark for correct option

Q3. Answer: (c) Polyester

Polyester is a synthetic fibre made from petroleum products. Cotton, wool, and silk are natural fibres obtained from plants and animals.

1 mark for correct option

Q4. Answer: (b) Silver

Silver is the best conductor of electricity among all metals. However, copper is most commonly used for electrical wiring because it is cheaper and almost as good a conductor as silver.

1 mark for correct option

Q5. Answer: (b) Newton

The SI unit of force is Newton (N), named after Sir Isaac Newton. One Newton is the force required to give a mass of 1 kg an acceleration of 1 m/s^2.

1 mark for correct option

Q6. Answer: (d) All of the above

Friction can be reduced by: (i) Polishing surfaces to make them smooth, (ii) Using lubricants like oil and grease, (iii) Using ball bearings in machines to replace sliding friction with rolling friction.

1 mark for correct option

Q7. Answer: (b) Decibel

The loudness or intensity of sound is measured in decibel (dB). The unit is named after Alexander Graham Bell. Normal conversation is about 60 dB, while sounds above 80 dB can be harmful to ears.

1 mark for correct option

Q8. Answer: (d) Both (b) and (c)

When electric current flows through a wire, it produces two effects: (i) **Heating effect** – the wire gets hot due to resistance, and (ii) **Magnetic effect** – the wire behaves like a magnet and can attract magnetic materials.

1 mark for correct option

Q9. Answer: (b) Virtual and erect

A plane mirror always forms a virtual, erect (upright), and laterally inverted image. The image is of the same size as the object and appears to be at the same distance behind the mirror as the object is in front of it.

1 mark for correct option

Q10. Answer: (c) Oxygen

During photosynthesis, plants use carbon dioxide and water in the presence of sunlight and chlorophyll to produce glucose and release oxygen. The oxygen released is used by all living organisms for respiration.

1 mark for correct option

Q11. Answer: (b) Reproductive organs mature

Puberty is the age (generally 10-14 years in girls and 12-16 years in boys) when reproductive organs become mature and functional. It is marked by various physical, mental, and emotional changes in adolescents.

1 mark for correct option

Q12. Answer: (c) Coal

Coal is formed from the remains of plants that got buried millions of years ago under the earth's surface. Petroleum and natural gas are formed from dead marine organisms (animals). All three are fossil fuels, but coal specifically comes from plants.

1 mark for correct option

Q13. Answer: (a) Barometer

Atmospheric pressure is measured by a barometer. A mercury barometer uses a column of mercury in a glass tube to measure air pressure. Normal atmospheric pressure at sea level is about 76 cm of mercury or 1013 millibars.

1 mark for correct option

Q14. Answer: (b) Soil erosion

Deforestation (cutting down of trees) leads to several harmful effects including soil erosion, as tree roots hold the soil together. It also causes decrease in rainfall, increase in carbon dioxide levels, loss of habitat for animals, and climate change.

1 mark for correct option

Q15. Answer: (b) Mars

Mars is known as the Red Planet because of its reddish appearance, which is due to iron oxide (rust) present on its surface. It is the fourth planet from the Sun

in our solar system.

1 mark for correct option

SECTION B ANSWERS – FILL IN THE BLANKS / TRUE-FALSE

Q16. Answer: Cell

The cell is the smallest structural and functional unit of life. All living organisms are made up of cells. Robert Hooke discovered cells in 1665.

1 mark for correct answer

Q17. Answer: Mitochondria

Mitochondria are called the powerhouse of the cell because they produce energy in the form of ATP through cellular respiration. They convert glucose and oxygen into energy.

1 mark for correct answer

Q18. Answer: Photosynthesis

Photosynthesis is the process by which green plants make their own food using carbon dioxide, water, and sunlight in the presence of chlorophyll. The food produced is in the form of glucose (starch).

1 mark for correct answer

Q19. Answer: Ductile

Ductility is the property of metals that allows them to be drawn into thin wires. Copper and aluminum are highly ductile metals. Gold is the most ductile metal and can be drawn into very thin wires.

> *1 mark for correct answer*

Q20. Answer: Fuel

A fuel is any substance that burns in the presence of oxygen to produce heat and light energy. Examples include wood, coal, petroleum, LPG, and natural gas.

> *1 mark for correct answer*

Q21. Answer: True

Friction is indeed a force that opposes the relative motion between two surfaces in contact. It acts in the opposite direction to the motion. Without friction, we would not be able to walk, vehicles could not move, and objects would keep sliding.

> *1 mark for correct answer*

Q22. Answer: False

Sound cannot travel through vacuum because it requires a medium (solid, liquid, or gas) to travel. Sound travels as vibrations through particles of matter. In vacuum, there are no particles, so sound cannot propagate.

> *1 mark for correct answer*

Q23. Answer: True

An electric bell works on the principle of electromagnetism. When current flows through the coil, it becomes an electromagnet and attracts the hammer, which strikes the gong. When the circuit breaks, the hammer returns to its original position, and the process repeats.

1 mark for correct answer

Q24. Answer: Night blindness

Night blindness (Nyctalopia) is caused by deficiency of Vitamin A. People suffering from this disease cannot see properly in dim light or at night. Vitamin A is essential for the formation of rhodopsin (visual purple) in the retina.

1 mark for correct answer

Q25. Answer: Winnowing

Winnowing is the process of separating grain from chaff by blowing air. The heavier grains fall down while the lighter chaff is blown away by the wind. This is a traditional agricultural practice.

1 mark for correct answer

Q26. Answer: False

Malaria is NOT caused by a virus. It is caused by a protozoan parasite called **Plasmodium**, which is transmitted to humans through the bite of infected female Anopheles mosquitoes.

1 mark for correct answer

Q27. Answer: False

Plastics are NOT biodegradable. They do not decompose naturally and can remain in the environment for hundreds of years, causing pollution. This is why we should reduce the use of plastic and recycle wherever possible.

1 mark for correct answer

Q28. Answer: Temperature

Temperature is the measure of how hot or cold an object is. It is measured using a thermometer. The SI unit of temperature is Kelvin (K), though Celsius (°C) is commonly used in daily life.

1 mark for correct answer

Q29. Answer: Low

A cyclone is a region of low atmospheric pressure. Air from surrounding high-pressure areas rushes towards the low-pressure center, creating strong winds. This is why cyclones bring heavy rains and storms.

1 mark for correct answer

Q30. Answer: True

The ozone layer in the stratosphere protects us from harmful ultraviolet (UV) rays from the sun. These UV rays can cause skin cancer, eye damage, and harm to plants and animals. Depletion of the ozone layer is a serious environmental concern.

1 mark for correct answer

SECTION C ANSWERS – SHORT ANSWER QUESTIONS

Q31. Answer: Microorganisms

Microorganisms are tiny living organisms that cannot be seen with the naked eye. They can only be observed under a microscope. They are found everywhere – in air, water, soil, and inside our bodies.

Two useful microorganisms:

- **Lactobacillus bacteria** – Used in making curd from milk
- **Yeast (fungus)** – Used in making bread and alcoholic beverages through fermentation

> *1 mark for definition, ½ mark for each useful microorganism (Total: 2 marks)*

Q32. Answer: Difference between Kharif and Rabi Crops

Kharif Crops	**Rabi Crops**
These crops are sown in the rainy season (June-July)	These crops are sown in winter (October-November)
They are harvested in autumn (September-October)	They are harvested in spring (March-April)
Example: Rice, Maize, Cotton	**Example:** Wheat, Pea, Mustard

> *1 mark for difference, 1 mark for examples (Total: 2 marks)*

Q33. Answer: Difference between Metals and Non-metals

Metals	**Non-metals**

1. Metals are generally solid at room temperature (except mercury)	1. Non-metals can be solid, liquid, or gas at room temperature
2. Metals are good conductors of heat and electricity	2. Non-metals are poor conductors (except graphite)
3. Metals are lustrous (shiny)	3. Non-metals are non-lustrous (dull)
4. Metals are malleable and ductile	4. Non-metals are brittle

Note: Any two differences are sufficient for full marks.

> *1 mark for each correct difference (Total: 2 marks)*

Q34. Answer: Friction

Friction is a force that opposes the relative motion between two surfaces in contact with each other.

Friction is both useful and harmful:

Useful example: Friction between our shoes and the ground allows us to walk without slipping. Without friction, we could not walk, run, or even stand properly.

Harmful example: Friction between moving parts of machines causes wear and tear, produces heat, and wastes energy. That's why we use lubricants like oil and grease to reduce friction.

> *½ mark for definition, ¾ mark for useful example, ¾ mark for harmful example (Total: 2 marks)*

Q35. Answer: Pressure

Pressure is defined as the force acting per unit area on a surface.

Formula: Pressure = Force / Area

SI Unit: Pascal (Pa) or Newton per square meter (N/m²)

Explanation: When the same force is applied over a smaller area, the pressure is greater. This is why a sharp knife (small area) cuts easily, but a blunt knife (large area) does not.

> *1 mark for definition with formula, 1 mark for SI unit (Total: 2 marks)*

Q36. Answer: Characteristics of Sound

Sound has three main characteristics:

1. **Pitch (Frequency):** It determines how high or low a sound is. High-pitched sounds (like a whistle) have high frequency, while low-pitched sounds (like a drum) have low frequency. Pitch is measured in Hertz (Hz).
2. **Loudness (Amplitude):** It determines how loud or soft a sound is. It depends on the amplitude of vibration. Loudness is measured in decibels (dB).
3. **Quality (Timbre):** It is the characteristic that helps us distinguish between sounds of the same pitch and loudness produced by different sources. For example, we can distinguish between a piano and a guitar playing the same note.

> *⅔ mark for each characteristic (Total: 2 marks)*

Q37. Answer: Conservation of Forests and Wildlife

We need to conserve forests and wildlife because:

1. **Biodiversity:** Forests are home to millions of species of plants, animals, and microorganisms. Conserving them helps maintain biodiversity.

2. **Oxygen and Climate:** Trees produce oxygen through photosynthesis and absorb carbon dioxide, helping to regulate climate and reduce global warming.
3. **Soil Conservation:** Tree roots hold soil together and prevent soil erosion. Forests also help in maintaining the water cycle.
4. **Resources:** Forests provide us with timber, medicines, fruits, and many other resources.
5. **Ecological Balance:** Wildlife maintains the balance in nature through food chains and food webs.

Note: Any two well-explained points are sufficient for full marks.

> *1 mark for each well-explained point (Total: 2 marks)*

Q38. Answer: Adolescence

Adolescence is the period of life between childhood and adulthood (approximately 10-19 years of age) when a person undergoes significant physical, mental, and emotional changes. This period begins with puberty.

Two changes that occur during adolescence:

1. **Physical changes:** Sudden increase in height, development of reproductive organs, voice change in boys, development of breasts in girls, growth of body hair, etc.
2. **Emotional changes:** Mood swings, increased self-awareness, desire for independence, development of personal identity, emotional sensitivity, etc.

> *1 mark for definition, ½ mark for each change (Total: 2 marks)*

Q39. Answer: Role of Chlorophyll in Photosynthesis

Chlorophyll is a green pigment present in the chloroplasts of plant cells. It plays a crucial role in photosynthesis:

- **Absorption of Light:** Chlorophyll absorbs light energy from the sun, particularly red and blue wavelengths, while reflecting green light (which is why plants appear green).
- **Energy Conversion:** The absorbed light energy is converted into chemical energy, which is used to combine carbon dioxide and water to produce glucose and oxygen.
- **Essential for Food Production:** Without chlorophyll, plants cannot make their own food, and the entire food chain would collapse since plants are primary producers.

Summary: Chlorophyll captures sunlight and converts it into chemical energy for making food.

> *2 marks for explaining the role properly (Total: 2 marks)*

Q40. Answer: Walking on Slippery Road

It is difficult to walk on a slippery road because:

- **Less Friction:** A slippery surface (like wet road, ice, or oily surface) has very little friction between our shoes and the ground.
- **Loss of Grip:** We need friction to push against the ground and move forward. Without adequate friction, our feet slip backward when we try to walk.
- **Explanation:** When we walk, we push our foot backward against the ground. The friction between our shoe and ground provides an equal and opposite reaction force that pushes us forward. On a slippery surface, this friction is reduced, making it difficult to walk and easy to slip and fall.

> *2 marks for proper explanation with reason (Total: 2 marks)*

SECTION D ANSWERS – LONG ANSWER QUESTIONS

Q41. Answer: Process of Combustion and Types

Combustion is a chemical process in which a substance reacts with oxygen to release heat and light. The substance that burns is called fuel, and oxygen is called supporter of combustion.

Requirements for Combustion:

- Fuel (combustible substance)
- Oxygen (or air)
- Ignition temperature (minimum temperature at which a substance catches fire)

Three Types of Combustion:

1. **Rapid Combustion:** A combustion in which a substance burns rapidly and produces heat and light. **Example:** Burning of LPG in a gas stove, burning of matchstick.
2. **Spontaneous Combustion:** A type of combustion in which a substance suddenly catches fire without any external source of heat or flame. **Example:** White phosphorus catches fire in air at room temperature; burning of coal dust in coal mines.
3. **Explosive Combustion:** A combustion in which a large amount of gas is produced along with tremendous heat, light, and sound. **Example:** Bursting of crackers, explosion of a bomb, burning of petrol vapors in the engine of a car.

> *1 mark for definition of combustion, 2 marks for three types with examples (Total: 3 marks)*

Q42. Answer: Structure of a Cell

Cell Structure: A cell has three main components:

1. **Cell Membrane:** The outermost covering of the cell that controls the entry and exit of substances. It is selectively permeable.
2. **Cytoplasm:** A jelly-like substance between the cell membrane and nucleus. It contains various cell organelles like mitochondria, ribosomes, endoplasmic reticulum, Golgi apparatus, etc.
3. **Nucleus:** The control center of the cell that contains genetic material (DNA). It controls all cellular activities and is responsible for reproduction.

Important Cell Organelles:

- **Mitochondria:** Powerhouse of the cell, produces energy (ATP)
- **Chloroplast:** Present in plant cells, contains chlorophyll for photosynthesis
- **Vacuole:** Storage space, larger in plant cells
- **Cell Wall:** Present only in plant cells, provides rigidity

[Labeled Diagram Expected]

> **Diagram Instructions:** Draw a simple cell with clearly labeled parts: Cell membrane, Cell wall (for plant cell), Cytoplasm, Nucleus, Mitochondria, Vacuole, Chloroplast (for plant cell).

1.5 marks for labeled diagram, 1.5 marks for explanation (Total: 3 marks)

Q43. Answer: Electromagnet

Electromagnet: An electromagnet is a temporary magnet made by passing electric current through a coil of wire wound around an iron core. It behaves like a magnet only when current flows through the coil.

Difference from Permanent Magnet:

Electromagnet	Permanent Magnet

Temporary magnet – works only when current flows	Permanent magnet – always magnetic
Magnetic strength can be changed by changing current	Magnetic strength is fixed
Polarity can be reversed by reversing current direction	Polarity cannot be changed

Uses of Electromagnet:

- Used in electric bells and buzzers
- Used in electric motors and generators
- Used in MRI machines in hospitals
- Used in cranes to lift heavy iron objects in junkyards
- Used in telephones and loudspeakers

(Any one use is sufficient for full marks)

> *1 mark for definition, 1 mark for difference, 1 mark for use (Total: 3 marks)*

Q44. Answer: Production and Propagation of Sound

Production of Sound:

Sound is produced by **vibrating objects**. When an object vibrates, it makes the particles of the medium around it vibrate. These vibrations travel through the medium in the form of waves.

Examples:

- When we pluck a guitar string, it vibrates and produces sound
- When we speak, our vocal cords vibrate
- When we strike a drum, its membrane vibrates

Propagation of Sound through Different Media:

1. **In Solids:** Sound travels fastest in solids because particles are closely packed. Example: Sound travels through a metal railway track faster than through air.
2. **In Liquids:** Sound travels slower in liquids than in solids but faster than in gases. Example: Whales and dolphins use sound to communicate underwater.
3. **In Gases:** Sound travels slowest in gases because particles are far apart. Example: Sound travels through air at about 340 m/s at room temperature.

Important Point: Sound cannot travel through vacuum because there are no particles to vibrate and carry the sound waves. This is why we cannot hear any sound in space.

Speed comparison: Speed in Solids > Speed in Liquids > Speed in Gases

> *1.5 marks for production, 1.5 marks for propagation through media (Total: 3 marks)*

Q45. Answer: Nitrogen Cycle

Nitrogen Cycle: The nitrogen cycle is the process by which nitrogen circulates between the atmosphere, soil, water, and living organisms.

Steps in the Nitrogen Cycle:

1. **Nitrogen Fixation:** Atmospheric nitrogen (N_2) is converted into usable forms like ammonia (NH_3) by:
    - Nitrogen-fixing bacteria like *Rhizobium* in root nodules of legumes
    - Lightning and industrial processes
2. **Nitrification:** Ammonia is converted into nitrites (NO_2^-) and then nitrates (NO_3^-) by soil bacteria. Plants absorb nitrates from soil.
3. **Assimilation:** Plants use nitrates to make proteins. Animals get nitrogen by eating plants or other animals.
4. **Ammonification:** When plants and animals die, decomposers (bacteria and fungi) break down their remains and release ammonia back into the soil.

5. **Denitrification:** Some bacteria convert nitrates back into nitrogen gas, which returns to the atmosphere, completing the cycle.

Importance:

- Nitrogen is essential for making proteins and DNA in living organisms
- Maintains soil fertility naturally
- Ensures continuous availability of nitrogen for plants and animals
- Reduces dependence on chemical fertilizers when leguminous crops are grown

[Simple Diagram Expected]

Diagram Instructions: Draw arrows showing: Atmosphere (N_2) → Nitrogen fixation → Soil (Nitrates) → Plants → Animals → Decomposers → Denitrification → Back to Atmosphere

1.5 marks for explanation of cycle, 1 mark for diagram, 0.5 mark for importance (Total: 3 marks)

SECTION E ANSWERS – DIAGRAM BASED / CASE BASED QUESTIONS

Q46. Answer: Human Eye Structure and Functions

Functions of Three Parts of the Eye:

1. **Cornea:** It is the transparent front part of the eye that allows light to enter. It also helps in focusing light. The cornea is protected by the eyelids and tears.
2. **Iris:** It is the colored part of the eye that controls the size of the pupil. It regulates the amount of light entering the eye – in bright light, the pupil becomes smaller, and in dim light, it becomes larger.
3. **Lens:** It is a transparent, flexible structure behind the pupil that focuses light onto the retina. The lens can change its shape (accommodation) to

focus on objects at different distances.

4. **Retina:** It is the light-sensitive inner lining at the back of the eye. It contains light-sensitive cells (rods and cones) that convert light into electrical signals, which are sent to the brain through the optic nerve.
5. **Optic Nerve:** It carries electrical signals from the retina to the brain, where they are interpreted as images.

(Any three parts with functions are sufficient for full marks)

[Labeled Diagram Expected]

> **Diagram Instructions:** Draw a cross-section of the human eye showing: Cornea, Iris, Pupil, Lens, Retina, Optic Nerve, Vitreous Humor, and Blind Spot. Label clearly.

1.5 marks for neat labeled diagram, 1.5 marks for explaining three functions (Total: 3 marks)

Q47. Answer: Case Study – Conservation of Forests

(i) Two benefits of forests: (1 mark)

- **Habitat for wildlife:** Forests provide home and shelter to millions of species of plants, animals, birds, and insects.
- **Prevent soil erosion:** Tree roots hold the soil together and prevent it from being washed away by rain or wind.
- **Other benefits:** Maintain water cycle, provide oxygen, absorb carbon dioxide, provide timber and medicines, regulate climate, etc.

(Any two benefits are acceptable)

(ii) Main causes of deforestation: (1 mark)

- Clearing land for agriculture and farming
- Urbanization and construction of buildings, roads, and industries

- Cutting trees for timber and furniture
- Setting up factories and industrial development

(Any two causes are acceptable)

(iii) Two measures to conserve forests: (1 mark)

- **Afforestation:** Planting more trees in deforested areas and creating new forests
- **Reduce paper use:** Using less paper and recycling paper products to reduce demand for wood
- **Protected areas:** Establishing national parks, wildlife sanctuaries, and biosphere reserves
- **Sustainable logging:** Cutting trees selectively and replanting them
- **Awareness:** Educating people about the importance of forests

(Any two measures are acceptable)

> *1 mark for each correct sub-question (Total: 3 marks)*

Q48. Answer: Case Study – Microorganisms in Agriculture

(i) Microorganism that helps in nitrogen fixation: (1 mark)

Rhizobium bacteria live in the root nodules of leguminous plants (like peas, beans, pulses) and help in nitrogen fixation. They convert atmospheric nitrogen into compounds that plants can use.

(ii) How decomposers help farmers: (1 mark)

Decomposers (bacteria and fungi) break down dead organic matter like dead plants, animals, and waste materials. They convert this complex organic matter into simple nutrients like nitrogen, phosphorus, and potassium, which are returned to the soil. This increases soil fertility naturally without the need for chemical fertilizers. Farmers benefit because:

- Soil becomes rich in nutrients

- Reduces need for expensive chemical fertilizers
- Improves crop yield naturally

(iii) Importance of nitrogen fixation for plants: (1 mark)

Nitrogen is an essential nutrient required by plants to make proteins, chlorophyll, and DNA. However, plants cannot use atmospheric nitrogen (N_2) directly. Nitrogen fixation converts atmospheric nitrogen into usable forms like ammonia and nitrates that plants can absorb through their roots. This helps plants:

- Grow healthy and strong
- Produce more leaves and fruits
- Make proteins necessary for their growth

Without nitrogen, plants would not be able to survive and grow properly.

> *1 mark for each correctly answered sub-question (Total: 3 marks)*

Q49. Answer: Case Study – Force and Pressure

(i) Why does the heavier box not move easily? (1 mark)

The heavier box does not move easily because:

- **Greater Inertia:** Heavier objects have more inertia (resistance to change in state of motion). More force is needed to overcome this inertia.
- **More Friction:** The heavier box exerts more pressure on the ground, which increases friction between the box and the surface. This friction opposes the motion.

Therefore, the same force that easily moves a lighter box is insufficient to move the heavier box.

(ii) Relation between force, pressure, and area: (1 mark)

The relationship is given by the formula:

Pressure = Force ÷ Area

This means:

- Pressure is **directly proportional** to force (if area is constant, more force means more pressure)
- Pressure is **inversely proportional** to area (if force is constant, smaller area means more pressure)

(iii) Why does a sharp knife cut better than a blunt knife? (1 mark)

A sharp knife has a very small cutting edge (small area), while a blunt knife has a larger cutting edge (large area). When we apply the same force:

- **Sharp knife:** Force is concentrated on a very small area, creating high pressure that easily cuts through vegetables
- **Blunt knife:** Same force is spread over a larger area, creating low pressure that cannot cut easily

Formula explanation: Since Pressure = Force ÷ Area, when area is small (sharp knife), pressure is high, making cutting easier.

> *1 mark for each correctly answered sub-question (Total: 3 marks)*

Q50. Answer: Electric Circuit Diagram

Components of an Electric Circuit:

- **Cell (Battery):** Source of electrical energy. The longer line represents the positive terminal, and the shorter line represents the negative terminal.
- **Connecting Wires:** Conduct electricity from one component to another. Usually made of copper.
- **Bulb:** Converts electrical energy into light and heat energy when current flows through it.
- **Switch:** Controls the flow of current in the circuit. It can be ON (closed) or OFF (open).

[Circuit Diagram Expected]

> **Diagram Instructions:** Draw a simple circuit showing a cell (with + and - terminals marked), two wires connecting the cell to a bulb, and a switch in the circuit. Use standard electrical symbols. Label all parts clearly.

What happens when the switch is ON:

When the switch is ON (closed position), it completes the circuit. The circuit becomes a **closed circuit**. Current flows from the positive terminal of the cell through the wire, through the bulb, through the switch, and back to the negative terminal of the cell. The bulb **glows** because current is flowing through it.

What happens when the switch is OFF:

When the switch is OFF (open position), it breaks the circuit. The circuit becomes an **open circuit**. There is a gap in the circuit, so current **cannot flow**. The bulb **does not glow** because no current is passing through it.

1.5 marks for neat labeled diagram, 1.5 marks for explanation (Total: 3 marks)

Marking Summary

Section	Question Type	Total Marks
Section A	Multiple Choice Questions (15 × 1)	15 marks
Section B	Fill in the Blanks / True-False (15 × 1)	15 marks
Section C	Short Answer Questions (10 × 2)	20 marks

Section D	Long Answer Questions (5 × 3)	15 marks
Section E	Diagram Based / Case Based Questions (5 × 3)	15 marks
TOTAL		80 marks

END OF ANSWER KEY – SET 1

Total Marks: 80

This is a comprehensive solved practice paper for Class 8 Science Annual Examination (Set 1).

Special focus on: Microorganisms | Crop Production | Metals & Non-metals | Force & Pressure | Sound | Light | Cell Structure | Combustion | Reproduction | Adolescence | Conservation | Electricity & Magnetism

Study thoroughly and understand all concepts.

For doubts and queries, contact: **Math Love Institute**

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This paper (Set 1) covers complete Class 8 NCERT Science syllabus including: Ch-1 Crop Production | Ch-2 Microorganisms | Ch-3 Synthetic Fibres & Plastics | Ch-4 Metals & Non-Metals | Ch-5 Coal & Petroleum | Ch-6 Combustion | Ch-7 Conservation of Plants & Animals | Ch-8 Cell Structure | Ch-9 Reproduction in Animals | Ch-10 Reaching Adolescence | Ch-11 Force & Pressure | Ch-12 Friction | Ch-13 Sound | Ch-14 Chemical Effects of Electric Current | Ch-15 Some Natural Phenomena | Ch-16 Light | Ch-17 Stars & Solar System | Ch-18 Pollution |

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