

MATH LOVE INSTITUTE

Annual Examination 2025-26

Class: VIII | Subject: Science (SET - 3)

Time: 3 Hours | Maximum Marks: 80

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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 of the following is a Rabi crop? **[1 Mark]**
- (a) Paddy
 - (b) Maize
 - (c) Wheat
 - (d) Cotton
- Q2.** The vaccine for smallpox was discovered by: **[1 Mark]**
- (a) Alexander Fleming
 - (b) Edward Jenner
 - (c) Louis Pasteur
 - (d) Robert Koch
- Q3.** Which of the following is a thermosetting plastic? **[1 Mark]**
- (a) Polythene
 - (b) PVC
 - (c) Bakelite
 - (d) Polystyrene
- Q4.** The most reactive metal is: **[1 Mark]**
- (a) Gold
 - (b) Potassium
 - (c) Copper
 - (d) Iron
- Q5.** Coal is formed from dead remains of: **[1 Mark]**
- (a) Animals
 - (b) Marine organisms
 - (c) Plants
 - (d) Fungi
- Q6.** The hottest part of a candle flame is: **[1 Mark]**
- (a) Innermost zone
 - (b) Middle zone
 - (c) Outer zone
 - (d) All zones are equally hot

- Q7.** A national park is established to: **[1 Mark]**
- (a) Protect wild animals
 - (b) Generate electricity
 - (c) Promote tourism only
 - (d) Conduct business activities
- Q8.** The powerhouse of the cell is: **[1 Mark]**
- (a) Nucleus
 - (b) Mitochondria
 - (c) Ribosome
 - (d) Golgi body
- Q9.** Which type of reproduction occurs in hydra? **[1 Mark]**
- (a) Binary fission
 - (b) Budding
 - (c) Fragmentation
 - (d) Spore formation
- Q10.** The hormone responsible for changes in males during adolescence is: **[1 Mark]**
- (a) Estrogen
 - (b) Insulin
 - (c) Testosterone
 - (d) Thyroxine
- Q11.** Friction can be reduced by: **[1 Mark]**
- (a) Making surfaces rough
 - (b) Using lubricants
 - (c) Increasing weight
 - (d) Increasing surface area

Q12. The SI unit of pressure is: **[1 Mark]**
(a) Newton
(b) Pascal
(c) Joule
(d) Watt

Q13. Sound cannot travel through: **[1 Mark]**
(a) Air
(b) Water
(c) Steel
(d) Vacuum

Q14. Lightning is caused by: **[1 Mark]**
(a) Friction between clouds
(b) Accumulation of charges in clouds
(c) Reflection of sunlight
(d) Magnetic field of earth

Q15. The angle of incidence is equal to: **[1 Mark]**
(a) Angle of refraction
(b) Angle of reflection
(c) 90 degrees
(d) 180 degrees

SECTION B – FILL IN THE BLANKS / TRUE-FALSE (15 × 1 = 15 Marks)
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Q16. The process of loosening and turning of soil is called _____. **[1 Mark]**

Q17. Rhizobium bacteria help in fixing _____ from the atmosphere. **[1 Mark]**

Q18. Rayon is also known as _____ silk. **[1 Mark]**

Q19. A metal that exists in liquid state at room temperature is _____. **[1 Mark]**

Q20. CNG stands for _____. **[1 Mark]**

- Q21. True or False:** Fire extinguishers use carbon dioxide because it is heavier than oxygen. [1 Mark]
- Q22.** Red Data Book contains information about _____ species. [1 Mark]
- Q23.** The jelly-like substance present in cells is called _____. [1 Mark]
- Q24. True or False:** Metamorphosis is the transformation of larva into adult. [1 Mark]
- Q25.** The age period from 11 to 19 years is called _____. [1 Mark]
- Q26.** Rolling friction is _____ than sliding friction. (greater/lesser) [1 Mark]
- Q27.** The eye of a cyclone is a region of _____ pressure. [1 Mark]
- Q28. True or False:** The pitch of sound depends on frequency. [1 Mark]
- Q29.** An electroscope is used to detect _____ charges. [1 Mark]
- Q30.** The splitting of white light into seven colors is called _____. [1 Mark]

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

- Q31.** Differentiate between Kharif and Rabi crops with two examples each. [2 Marks]
- Q32.** What are antibiotics? Give two examples. [2 Marks]
- Q33.** Why is plastic considered harmful to the environment? Give two reasons. [2 Marks]
- Q34.** Write two properties of metals and two properties of non-metals. [2 Marks]
- Q35.** What is the difference between exhaustible and inexhaustible natural resources? [2 Marks]

- Q36.** What are the three essential requirements for combustion? **[2 Marks]**
- Q37.** What is biodiversity? Why is it important? **[2 Marks]**
- Q38.** Differentiate between unicellular and multicellular organisms with examples. **[2 Marks]**
- Q39.** What is the difference between external and internal fertilization? **[2 Marks]**
- Q40.** Why does a sharp knife cut vegetables more easily than a blunt knife? **[2 Marks]**

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

- Q41.** Explain the nitrogen cycle with the help of a diagram. **[3 Marks]**
- Q42.** Describe the process of making synthetic fibers. Why are synthetic fibers more popular than natural fibers? **[3 Marks]**
- Q43.** What is corrosion? How can we prevent rusting of iron? Explain any three methods. **[3 Marks]**
- Q44.** Explain the three types of friction with suitable examples. **[3 Marks]**
- Q45.** Describe the structure of human eye with a neat labeled diagram. **[3 Marks]**

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

- Q46.** Draw a neat labeled diagram of a plant cell and an animal cell. Write two differences between them. **[3 Marks]**

Q47. Case Study: Deforestation and Wildlife**[3 Marks]**

A forest near a village was cut down to build a factory. After a few years, villagers noticed that the temperature increased, rainfall decreased, and many animals disappeared. The soil also became less fertile.

Answer the following:

- (i) What is deforestation? (1 mark)
- (ii) List three consequences of deforestation as mentioned in the case. (1 mark)
- (iii) Suggest two ways to prevent deforestation. (1 mark)

Q48. Case Study: Changes During Adolescence**[3 Marks]**

Raj noticed several changes in his body when he turned 13. His voice became deeper, he started growing facial hair, and his height increased rapidly. His sister Priya, who is 12 years old, also noticed changes like development of breasts and onset of menstruation.

Answer the following:

- (i) What are these changes called? (1 mark)
- (ii) Name the hormone responsible for changes in boys and girls. (1 mark)
- (iii) Why do these changes occur? (1 mark)

Q49. Case Study: Sound and Its Properties**[3 Marks]**

During a science experiment, students observed that when a bell was placed under a glass jar and air was gradually removed using a vacuum pump, the sound of the bell became fainter and eventually could not be heard at all.

Answer the following:

- (i) Why did the sound become fainter? (1 mark)
- (ii) What does this experiment prove about sound? (1 mark)
- (iii) Can sound travel through solids? Give one example. (1 mark)

Q50. Draw a neat labeled diagram showing the reflection of light by a**[3 Marks]**

plane mirror. Show incident ray, reflected ray, normal, angle of incidence, and angle of reflection. State the laws of reflection.

ANSWER KEY – SECTION A (MCQs)

Q1. Answer: (c) Wheat

Explanation: Wheat is a Rabi crop that is sown in winter (October-November) and harvested in spring (March-April). Other Rabi crops include gram, pea, mustard, and barley. Paddy, maize, and cotton are Kharif crops sown in the rainy season.

1 mark for correct answer

Q2. Answer: (b) Edward Jenner

Explanation: Edward Jenner discovered the vaccine for smallpox in 1796. He observed that milkmaids who contracted cowpox did not get smallpox and used this discovery to develop the first vaccine.

1 mark for correct answer

Q3. Answer: (c) Bakelite

Explanation: Bakelite is a thermosetting plastic that cannot be softened by heating once it is molded. It is used in making electrical switches, handles of utensils, etc. Polythene, PVC, and polystyrene are thermoplastics.

1 mark for correct answer

Q4. Answer: (b) Potassium

Explanation: Potassium is the most reactive metal among the given options. It reacts vigorously with water and even catches fire. It must be stored in kerosene to prevent it from reacting with air and moisture.

1 mark for correct answer

Q5. Answer: (c) Plants

Explanation: Coal is formed from dead remains of plants that got buried under the earth millions of years ago. Due to high pressure and temperature, these plants converted into coal over millions of years.

1 mark for correct answer

Q6. Answer: (c) Outer zone

Explanation: The outer zone (blue zone) of a candle flame is the hottest part because it has complete combustion with sufficient oxygen supply. The innermost zone is the least hot and contains unburnt wax vapors.

1 mark for correct answer

Q7. Answer: (a) Protect wild animals

Explanation: A national park is a protected area established to conserve wildlife, plants, and natural habitats. Hunting, grazing, and other human activities are prohibited in national parks to protect endangered species.

1 mark for correct answer

Q8. Answer: (b) Mitochondria

Explanation: 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 that the cell uses for various activities.

1 mark for correct answer

Q9. Answer: (b) Budding

Explanation: Hydra reproduces asexually through budding. A small outgrowth called a bud develops on the parent body, grows, and eventually detaches to form a new individual.

1 mark for correct answer

Q10. Answer: (c) Testosterone

Explanation: Testosterone is the male hormone produced by testes that is responsible for changes during adolescence in boys such as deepening of voice, growth of facial hair, and muscle development. Estrogen is the female hormone.

1 mark for correct answer

Q11. Answer: (b) Using lubricants

Explanation: Lubricants like oil, grease, or graphite reduce friction by making surfaces smooth and creating a thin layer between them. This allows easier movement. Making surfaces rough increases friction.

1 mark for correct answer

Q12. Answer: (b) Pascal

Explanation: Pascal (Pa) is the SI unit of pressure. One Pascal is equal to one Newton per square meter ($1 \text{ Pa} = 1 \text{ N/m}^2$). Pressure is calculated as Force divided by Area.

1 mark for correct answer

Q13. Answer: (d) Vacuum

Explanation: Sound cannot travel through vacuum because it requires a medium (solid, liquid, or gas) to travel. Sound waves are mechanical waves that need particles of matter to propagate.

1 mark for correct answer

Q14. Answer: (b) Accumulation of charges in clouds

Explanation: Lightning is caused by the accumulation of electric charges in clouds. When the amount of charge becomes very large, it is discharged between clouds or between clouds and earth, producing lightning.

1 mark for correct answer

Q15. Answer: (b) Angle of reflection

Explanation: According to the first law of reflection, the angle of incidence is always equal to the angle of reflection. Both angles are measured from the normal (perpendicular) to the reflecting surface.

1 mark for correct answer

ANSWER KEY – SECTION B (Fill in the Blanks / True-False)

Q16. Answer: Tilling / Ploughing

Explanation: Tilling or ploughing is the process of loosening and turning of soil using a plough. This helps in aerating the soil, bringing nutrients to the surface, and burying weeds.

1 mark for correct answer

Q17. Answer: Nitrogen

Explanation: Rhizobium bacteria live in the root nodules of leguminous plants (peas, beans, pulses) and help in fixing atmospheric nitrogen into compounds that plants can absorb and use.

1 mark for correct answer

Q18. Answer: Artificial

Explanation: Rayon is also known as artificial silk because it resembles silk but is made artificially from cellulose (wood pulp). It is cheaper than natural silk and has a similar appearance.

1 mark for correct answer

Q19. Answer: Mercury

Explanation: Mercury is the only metal that exists in liquid state at room temperature. It is used in thermometers, barometers, and fluorescent lamps.

1 mark for correct answer

Q20. Answer: Compressed Natural Gas

Explanation: CNG stands for Compressed Natural Gas. It is a clean fuel used in vehicles as it produces less pollution compared to petrol and diesel. It mainly contains methane.

1 mark for correct answer

Q21. Answer: True

Explanation: Fire extinguishers use carbon dioxide because CO_2 is heavier than oxygen and air. When released, it forms a blanket around the fire, cutting off the oxygen supply and extinguishing the fire.

1 mark for correct answer

Q22. Answer: Endangered

Explanation: Red Data Book is a public document that contains information about endangered and threatened species of plants and animals. It helps in conservation efforts by identifying species at risk of extinction.

1 mark for correct answer

Q23. Answer: Cytoplasm

Explanation: Cytoplasm is the jelly-like substance present between the cell membrane and nucleus. It contains all cell organelles and is the site of various cellular activities.

1 mark for correct answer

Q24. Answer: True

Explanation: Metamorphosis is the biological process of transformation from larval stage to adult form. Examples include caterpillar to butterfly and tadpole to frog.

1 mark for correct answer

Q25. Answer: Adolescence

Explanation: Adolescence is the period of life between childhood and adulthood, typically from 11 to 19 years of age. It is marked by puberty and various physical, mental, and emotional changes.

1 mark for correct answer

Q26. Answer: Lesser

Explanation: Rolling friction is much lesser than sliding friction. This is why wheels were invented - it's easier to roll an object than to slide it. Ball bearings reduce friction by converting sliding friction into rolling friction.

1 mark for correct answer

Q27. Answer: Low

Explanation: The eye of a cyclone is the central calm region with low pressure. It has clear skies and light winds, while the surrounding areas experience strong winds and heavy rain.

1 mark for correct answer

Q28. Answer: True

Explanation: The pitch of sound depends on its frequency. High frequency sounds have high pitch (like whistle), while low frequency sounds have low pitch (like drum). Pitch is measured in Hertz (Hz).

1 mark for correct answer

Q29. Answer: Electric / Electrical

Explanation: An electroscope is a simple device used to detect the presence of electric charges on a body. It consists of a metal rod with two thin metal leaves at the bottom.

1 mark for correct answer

Q30. Answer: Dispersion

Explanation: Dispersion is the splitting of white light into its seven constituent colors (VIBGYOR) when it passes through a prism. This happens because different colors have different wavelengths and refract at different angles.

1 mark for correct answer

ANSWER KEY – SECTION C (Short Answer Questions)

Q31. Answer: Difference between Kharif and Rabi Crops

Kharif Crops	Rabi Crops
Sown in rainy season (June-July)	Sown in winter season (October-November)
Harvested in September-October	Harvested in March-April
Require more water	Require less water
Examples: Paddy, Maize, Cotton, Soybean	Examples: Wheat, Gram, Pea, Mustard

1 mark for differences, 1 mark for examples (Total: 2 marks)

Q32. Answer: Antibiotics

Definition: Antibiotics are medicines that kill or stop the growth of disease-causing microorganisms, particularly bacteria. They are produced from microorganisms like bacteria and fungi.

Examples:

- **Penicillin:** First antibiotic discovered by Alexander Fleming from *Penicillium* fungus. Used to treat bacterial infections.

- **Streptomycin:** Used to treat tuberculosis and other bacterial infections.
- **Tetracycline:** Broad-spectrum antibiotic used for various infections.
- **Erythromycin:** Used for respiratory tract infections.

Note: Antibiotics are effective only against bacteria and not against viruses.

1 mark for definition, 1 mark for examples (Total: 2 marks)

Q33. Answer: Why Plastic is Harmful to Environment

Plastic is considered harmful to the environment due to the following reasons:

- **Non-biodegradable:** Plastic does not decompose naturally and remains in the environment for hundreds of years. This leads to accumulation of plastic waste in landfills and water bodies.
- **Soil pollution:** When plastic is buried in soil, it prevents water from seeping into the ground and makes soil infertile. Plants cannot grow properly in such soil.
- **Harmful to animals:** Animals often eat plastic bags mistaking them for food, which can choke them or block their digestive system, leading to death.
- **Water pollution:** Plastic waste in oceans and rivers harms aquatic life. Marine animals get entangled in plastic or consume plastic particles.
- **Toxic fumes:** When plastic is burned, it releases toxic fumes that cause air pollution and respiratory problems.

(Any two reasons are acceptable)

1 mark for each reason (Total: 2 marks)

Q34. Answer: Properties of Metals and Non-metals

Properties of Metals	Properties of Non-metals
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1. Metals are lustrous (shiny)	1. Non-metals are non-lustrous (except iodine and graphite)
2. Metals are good conductors of heat and electricity	2. Non-metals are poor conductors (except graphite)
3. Metals are malleable (can be beaten into sheets)	3. Non-metals are brittle (break easily)
4. Metals are ductile (can be drawn into wires)	4. Non-metals are non-ductile
5. Metals are solid at room temperature (except mercury)	5. Non-metals exist in all three states
6. Metals have high melting and boiling points	6. Non-metals have low melting and boiling points
7. Metals produce ringing sound when struck (sonorous)	7. Non-metals do not produce ringing sound

(Any two properties of each are acceptable)

1 mark for properties of metals, 1 mark for properties of non-metals (Total: 2 marks)



Q35. Answer: Exhaustible vs Inexhaustible Natural Resources

Exhaustible Resources	Inexhaustible Resources
Definition: Resources that are present in limited quantity and will get exhausted with continuous use	Definition: Resources that are present in unlimited quantity and will not get exhausted
Take millions of years to form	Are naturally replenished
Once used, cannot be obtained back	Can be used again and again

Examples: Coal, Petroleum, Natural gas, Minerals, Forests	Examples: Solar energy, Wind energy, Water, Air, Sunlight
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Note: We must use exhaustible resources carefully and judiciously as they cannot be replenished quickly.

1 mark for each type with examples (Total: 2 marks)

Q36. Answer: Three Essential Requirements for Combustion

For combustion (burning) to occur, three things are essential:

1. **Fuel (Combustible substance):** A substance that can burn, such as wood, coal, petrol, LPG, natural gas, etc. The fuel should have the ability to catch fire.
2. **Oxygen (Supporter of combustion):** Oxygen from air is necessary for burning. Without oxygen, combustion cannot take place. This is why a fire can be extinguished by cutting off the air supply.
3. **Ignition temperature (Heat):** The minimum temperature at which a substance catches fire is called its ignition temperature. Different substances have different ignition temperatures. Heat must be supplied to raise the temperature of fuel to its ignition point.

Fire Triangle: These three requirements are represented as a triangle called the "fire triangle." If any one of these is removed, combustion will stop.

2 marks for all three requirements correctly explained (0.5 mark can be deducted if explanation is incomplete)

Q37. Answer: Biodiversity and Its Importance

Definition: Biodiversity refers to the variety of different species of plants, animals, and microorganisms found in a particular area or region. It includes all living organisms and the ecosystems they form.

Importance of Biodiversity:

- **Food and Agriculture:** Provides us with food crops, livestock, fisheries, and forestry. Different species offer variety in food.
- **Medicines:** Many medicines are derived from plants and animals. About 25% of medicines come from natural sources.
- **Ecological Balance:** Each species plays a specific role in the ecosystem. Loss of one species can affect the entire ecosystem.
- **Oxygen and Clean Air:** Plants produce oxygen through photosynthesis and purify the air.
- **Climate Regulation:** Forests and oceans help regulate climate and prevent global warming.
- **Economic Value:** Tourism, research, and industries depend on biodiversity.
- **Cultural and Aesthetic Value:** Biodiversity enriches our lives and has cultural significance.

(Any two points on importance are acceptable)

1 mark for definition, 1 mark for importance (Total: 2 marks)

Q38. Answer: Unicellular vs Multicellular Organisms

Unicellular Organisms	Multicellular Organisms
Made up of only one cell	Made up of many cells
All life processes occur in a single cell	Different cells perform different functions
Cannot be seen with naked eye (microscopic)	Can be seen with naked eye (macroscopic)
Simple body organization	Complex body organization with tissues and organs

Examples: Amoeba, Paramecium, Bacteria, Yeast, Euglena	Examples: Humans, Animals, Plants, Trees, Fungi
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1 mark for differences, 1 mark for examples (Total: 2 marks)

Q39. Answer: External vs Internal Fertilization

External Fertilization	Internal Fertilization
Fusion of male and female gametes occurs outside the body	Fusion of male and female gametes occurs inside the female body
Usually occurs in water	Occurs on land or inside the body
Large number of eggs are produced	Fewer eggs are produced
Less parental care	More parental care
Chances of survival of offspring are less	Chances of survival of offspring are more
Examples: Fish, Frogs, Starfish	Examples: Humans, Dogs, Cats, Birds, Reptiles

1 mark for each type with examples (Total: 2 marks)

Q40. Answer: Why Sharp Knife Cuts Better

A sharp knife cuts vegetables more easily than a blunt knife due to the principle of pressure.

Explanation:

Formula: Pressure = Force ÷ Area

- **Sharp Knife:** A sharp knife has a very thin cutting edge, which means it has a very small area in contact with the vegetable. When we apply force, this force acts on a very small area, creating high pressure. High pressure easily cuts through the vegetable.
- **Blunt Knife:** A blunt knife has a thicker cutting edge with larger area in contact with the vegetable. When the same force is applied, it is distributed over a larger area, creating low pressure. Low pressure cannot cut easily.

Conclusion: Since $\text{Pressure} = \text{Force} \div \text{Area}$, when area is small (sharp knife), pressure is high, making cutting easy. When area is large (blunt knife), pressure is low, making cutting difficult.

Similar Examples:

- Needles have sharp tips to pierce easily
- Nails have pointed ends
- Axes have sharp edges

2 marks for complete explanation with formula and reasoning

ANSWER KEY – SECTION D (Long Answer Questions)

Q41. Answer: Nitrogen Cycle

Definition: The nitrogen cycle is the continuous circulation of nitrogen through the atmosphere, soil, and living organisms.

Steps of Nitrogen Cycle:

- 1. Nitrogen Fixation:** Atmospheric nitrogen (N_2) is converted into usable forms like ammonia (NH_3) and nitrates (NO_3^-) by:
 - Rhizobium bacteria in root nodules of leguminous plants
 - Lightning in atmosphere
 - Industrial processes (fertilizers)
- 2. Nitrification:** Ammonia in soil is converted into nitrites (NO_2^-) and then into nitrates (NO_3^-) by nitrifying bacteria. Plants absorb these nitrates through their roots.
- 3. Assimilation:** Plants use nitrates to make proteins. When animals eat plants, they get these proteins.
- 4. Ammonification:** When plants and animals die, decomposers (bacteria and fungi) break down proteins and release ammonia back into the soil.
- 5. Denitrification:** Some bacteria (denitrifying bacteria) convert nitrates back into atmospheric nitrogen, completing the cycle.

[Diagram Expected - showing circular flow:]

Diagram Instructions: Draw a circular diagram showing:

- Atmospheric Nitrogen (N₂) at top
- Arrow down labeled "Nitrogen Fixation (Rhizobium, Lightning)" to Soil Nitrogen
- Arrow labeled "Nitrification" to Nitrates in soil
- Arrow to Plants (showing absorption)
- Arrow to Animals (showing consumption)
- Arrow from dead plants/animals labeled "Decomposers" back to Soil Nitrogen
- Arrow labeled "Denitrification" back to Atmospheric Nitrogen
- Label all steps clearly

Importance: Nitrogen is essential for making proteins, DNA, and chlorophyll in plants. The nitrogen cycle ensures continuous supply of nitrogen to all living organisms.

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



Q42. Answer: Synthetic Fibers - Making Process and Advantages

Process of Making Synthetic Fibers:

1. **Raw Material:** Synthetic fibers are made from chemicals obtained from petroleum (coal and natural gas). These are called petrochemicals.
2. **Polymerization:** Small chemical units called monomers are joined together to form long chains called polymers through a process called polymerization.
3. **Spinning:** The polymer is melted and forced through tiny holes (spinnerets) to form long, thin fibers.
4. **Drawing:** The fibers are stretched to make them stronger and thinner.
5. **Processing:** The fibers are then woven or knitted into fabrics and dyed as required.

Why Synthetic Fibers are More Popular than Natural Fibers:

- **Cost-effective:** Cheaper to produce than natural fibers like silk and wool
- **Durability:** More durable and long-lasting than natural fibers
- **Easy to maintain:** Dry quickly, don't wrinkle easily, easy to wash
- **Strength:** Stronger than natural fibers and don't shrink
- **Resistance:** Resistant to damage from insects, molds, and chemicals
- **Variety:** Can be made in different colors, textures, and properties
- **Available throughout the year:** Not dependent on seasons like natural fibers

Examples of Synthetic Fibers: Polyester, Nylon, Acrylic, Rayon

Disadvantages: They melt on heating, not very comfortable in hot weather as they don't absorb sweat, and are not biodegradable.

1.5 marks for process, 1.5 marks for advantages (Total: 3 marks)

Q43. Answer: Corrosion and Prevention of Rusting

What is Corrosion?

Corrosion is the slow eating away of metal due to attack by atmospheric moisture, oxygen, acids, or other chemicals. When iron corrodes, it forms a reddish-brown coating called rust. The process is called rusting.

Chemical Reaction:

Iron + Oxygen (from air) + Water (moisture) → Iron oxide (Rust - Fe_2O_3)

Three Methods to Prevent Rusting of Iron:

1. Painting:

- Applying paint on iron articles creates a protective layer
- Paint prevents air and moisture from coming in contact with iron
- Common method for doors, gates, bridges, and vehicles
- Paint needs to be reapplied periodically

2. Oiling/Greasing:

- Applying oil or grease forms a protective coating
- Prevents oxygen and water from reaching the metal surface
- Used for tools, machines, and moving parts
- Needs regular application

3. Galvanization:

- Process of coating iron with a layer of zinc
- Zinc is more reactive than iron and protects it from corrosion
- Even if the zinc coating is scratched, zinc corrodes first protecting iron
- Used for water pipes, fences, buckets, and iron sheets
- Most effective and long-lasting method

Other Methods:

- **Electroplating:** Coating with chromium or nickel (used in vehicles)
- **Alloying:** Making stainless steel by mixing iron with chromium and nickel
- **Using sacrificial metals:** Placing more reactive metals that corrode instead of iron

Note: Any three methods with proper explanation are acceptable.

1 mark for definition of corrosion, 2 marks for three prevention methods (Total: 3 marks)

Q44. Answer: Three Types of Friction

Friction: The force that opposes the motion of an object when it comes in contact with another surface is called friction.

Three Types of Friction:

1. Static Friction:

Definition: The friction that acts on objects when they are at rest and prevents them from starting to move is called static friction.

Characteristics:

- It is the maximum friction
- Acts when there is no relative motion between surfaces
- Must be overcome to start motion

Examples:

- A book resting on a table doesn't move unless we apply enough force
- A heavy box on the floor needs more force to start moving
- A car parked on a slope doesn't slide down due to static friction
- Our feet don't slip when we stand still due to static friction

2. Sliding Friction:

Definition: The friction that acts when an object slides over another surface is called sliding friction.

Characteristics:

- Less than static friction but more than rolling friction
- Acts in the direction opposite to motion
- Depends on the nature of surfaces in contact

Examples:

- A book sliding on a table
- Pushing a box across the floor
- Sledding down a snowy hill
- Sliding a chair on the floor
- Skis sliding on snow

3. Rolling Friction:

Definition: The friction that acts when an object rolls over a surface is called rolling friction.

Characteristics:

- Least among all types of friction
- Much easier to roll an object than to slide it

- This is why wheels were invented

Examples:

- A ball rolling on the ground
- Wheels of a car or bicycle moving on road
- Rolling a barrel
- Marbles rolling on a surface
- Suitcases with wheels

Comparison: Static Friction > Sliding Friction > Rolling Friction

Practical Application: Ball bearings are used in machines to reduce friction by converting sliding friction into rolling friction.

1 mark for each type with examples (Total: 3 marks)



Q45. Answer: Structure of Human Eye

[Neat Labeled Diagram Expected - showing all parts of the eye]

Diagram Instructions: Draw a cross-section of human eye showing:

- Cornea (transparent outer layer at front)
- Iris (colored part)
- Pupil (black opening in center)
- Lens (behind pupil)
- Retina (at the back)
- Optic nerve (at the back)
- Blind spot (where optic nerve attaches)
- Ciliary muscles (around lens)
- Aqueous humor (fluid between cornea and lens)
- Vitreous humor (fluid inside eyeball)

All parts should be clearly labeled with neat lines pointing to each structure.

Parts and Their Functions:

- **Cornea:** Transparent outer covering that protects the eye and helps focus light
- **Iris:** Colored part of the eye that controls the amount of light entering the eye
- **Pupil:** Black opening in the center of iris through which light enters. It expands in dim light and contracts in bright light
- **Lens:** Transparent, flexible structure that focuses light on the retina. Its shape is changed by ciliary muscles for accommodation
- **Retina:** Light-sensitive inner layer containing light receptors (rods and cones). It converts light into electrical signals
- **Optic Nerve:** Carries electrical signals from retina to the brain for interpretation
- **Blind Spot:** Point where optic nerve leaves the eye; has no light receptors
- **Ciliary Muscles:** Control the shape of lens for focusing
- **Aqueous Humor & Vitreous Humor:** Fluids that maintain shape of eyeball and provide nutrients

How We See:

1. Light from object enters through cornea
2. Passes through pupil (iris controls amount)
3. Lens focuses light on retina
4. Retina converts light into electrical signals
5. Optic nerve carries signals to brain
6. Brain interprets the image

2 marks for neat labeled diagram, 1 mark for explanation (Total: 3 marks)

ANSWER KEY – SECTION E (Diagram Based / Case Based Questions)

Q46. Answer: Plant Cell and Animal Cell Diagrams

[Two Neat Labeled Diagrams Expected]

Diagram 1 - Plant Cell: Draw a rectangular cell showing:

- Cell Wall (outermost thick layer)
- Cell Membrane (inside cell wall)
- Nucleus (large, central)
- Cytoplasm (filling the cell)
- Chloroplasts (green oval structures)
- Large Central Vacuole (takes most space)
- Mitochondria

Diagram 2 - Animal Cell: Draw an irregular/round cell showing:

- Cell Membrane (outer boundary, no cell wall)
- Nucleus (central)
- Cytoplasm
- Mitochondria
- Small Vacuoles (if any)
- Golgi Body
- Ribosomes (small dots)

Two Differences Between Plant Cell and Animal Cell:

Plant Cell	Animal Cell
1. Has cell wall (made of cellulose) outside cell membrane	1. No cell wall, only cell membrane present
2. Has chloroplasts (for photosynthesis)	2. No chloroplasts present
3. Has large central vacuole	3. Has small or no vacuoles
4. Usually rectangular or square shape	4. Usually irregular or round shape
5. Cannot change shape due to rigid cell wall	5. Can change shape as no cell wall

(Any two differences are acceptable)

*1 mark for plant cell diagram, 1 mark for animal cell diagram, 1 mark for differences
(Total: 3 marks)*

Q47. Answer: Case Study – Deforestation and Wildlife

(i) What is deforestation? (1 mark)

Deforestation is the cutting down and clearing of forests on a large scale for various human activities such as agriculture, urbanization, industrialization, construction, and obtaining timber and fuel wood. It means permanent removal of forest cover.

(ii) Three consequences of deforestation mentioned in the case: (1 mark)

- **Increased temperature:** Villagers noticed temperature increased after forest was cut
- **Decreased rainfall:** The area received less rain after deforestation
- **Loss of wildlife:** Many animals disappeared from the area
- **Reduced soil fertility:** The soil became less fertile

(Any three from the case study)

Additional Consequences:

- Loss of biodiversity
- Soil erosion and landslides
- Floods and droughts
- Increase in carbon dioxide (global warming)
- Disruption of water cycle
- Loss of habitat for animals

(iii) Two ways to prevent deforestation: (1 mark)

- **Afforestation:** Planting more trees in deforested areas and on barren lands to increase forest cover
- **Controlled and selective cutting:** If trees must be cut, do it selectively and plant new trees to replace them (sustainable forestry)
- **Strict laws and enforcement:** Implementing and enforcing laws against illegal cutting of trees and poaching
- **Creating awareness:** Educating people about importance of forests and consequences of deforestation
- **Protected areas:** Establishing national parks, wildlife sanctuaries, and biosphere reserves
- **Use alternatives:** Using alternatives to wood like recycled paper, reducing paper consumption
- **Forest management:** Proper management of forest resources

(Any two ways are acceptable)

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

Q48. Answer: Case Study – Changes During Adolescence

(i) What are these changes called? (1 mark)

These changes are called **secondary sexual characteristics** or **puberty changes**. The period during which these changes occur is called **adolescence**, and the beginning of these changes is called **puberty**.

(ii) Name the hormone responsible for changes in boys and girls: (1 mark)

- **In Boys (like Raj): Testosterone** hormone produced by testes is responsible for changes such as:
 - Deepening of voice
 - Growth of facial hair (beard and mustache)
 - Broadening of shoulders
 - Development of muscles
 - Growth of body hair
- **In Girls (like Priya): Estrogen** (and Progesterone) hormones produced by ovaries are responsible for changes such as:
 - Development of breasts
 - Onset of menstruation
 - Widening of hips
 - High-pitched voice
 - Development of body hair in certain areas

(iii) Why do these changes occur? (1 mark)

These changes occur because:

- **Preparation for reproduction:** The body is preparing for its reproductive phase. These changes make the body capable of reproduction.
- **Hormonal changes:** The pituitary gland (master gland) releases hormones that signal the reproductive organs (testes in boys and ovaries in girls) to produce sex hormones.
- **Natural development:** It is a natural part of growing up from childhood to adulthood. These changes transform the body from a child's body to an adult body.
- **Maturation of reproductive system:** The reproductive system matures and becomes functional during this period.

Note: This is a sensitive period requiring proper guidance, nutrition, and emotional support. Adolescents should maintain good hygiene, eat nutritious food, exercise regularly, and seek guidance from parents and teachers.

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

Q49. Answer: Case Study – Sound and Its Properties

(i) Why did the sound become fainter? (1 mark)

The sound became fainter because the air inside the glass jar was being gradually removed. As more and more air was pumped out:

- The number of air molecules (medium) decreased
- With fewer air molecules, sound waves had fewer particles to vibrate
- The sound energy could not travel efficiently
- Therefore, the intensity of sound decreased and it became fainter

When almost all air was removed (creating near vacuum), there were no air molecules left to carry sound, so no sound could be heard.

(ii) What does this experiment prove about sound? (1 mark)

This experiment proves that:

- **Sound requires a medium to travel:** Sound cannot travel through vacuum (empty space with no matter)
- **Sound is a mechanical wave:** It needs material particles (solid, liquid, or gas) to propagate
- **Sound travels through vibrations:** Sound waves travel by making particles of medium vibrate

Conclusion: Unlike light, which can travel through vacuum (like sunlight reaching Earth through space), sound cannot travel through vacuum. This is why there is no sound in space.

(iii) Can sound travel through solids? Give one example: (1 mark)

Yes, sound can travel through solids. In fact, sound travels fastest in solids compared to liquids and gases because particles in solids are very close together and can transmit vibrations more quickly.

Examples:

- **Railway track:** When a train is coming, we can hear the sound by putting our ear to the railway track even when the train is far away and we cannot hear it through air
- **Wooden table:** If someone taps one end of a long wooden table and you put your ear on the other end, you can hear the sound clearly
- **Stethoscope:** Doctors use stethoscope to hear heartbeat. Sound travels through the rubber tubes (solid) to reach the doctor's ears
- **Tin can telephone:** Two tin cans connected by a tight string. When you speak into one can, sound travels through the string to the other can
- **Door knocking:** When someone knocks on a door, sound travels through the solid door material

(Any one example is acceptable)

Speed comparison: Sound travels fastest in solids, slower in liquids, and slowest in gases.

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



Q50. Answer: Reflection of Light by Plane Mirror

[Neat Labeled Diagram Expected]

Diagram Instructions: Draw a diagram showing:

- A vertical line representing a plane mirror (with shaded back)
- A point O on the mirror (point of incidence)
- A perpendicular dotted line at O (Normal - NN')
- An arrow coming from top left to O (Incident Ray)

- An arrow going from O to top right (Reflected Ray)
- Angle between Incident Ray and Normal labeled as 'i' (Angle of Incidence)
- Angle between Reflected Ray and Normal labeled as 'r' (Angle of Reflection)
- All parts clearly labeled

Laws of Reflection:

First Law of Reflection:

The incident ray, the reflected ray, and the normal at the point of incidence all lie in the same plane.

Explanation: All three (incident ray, reflected ray, and normal) are in one flat surface - they don't point in different directions in 3D space.

Second Law of Reflection:

The angle of incidence is equal to the angle of reflection.

$$\angle i = \angle r$$

Explanation: The angle at which light hits the mirror (measured from the normal) equals the angle at which it bounces off (also measured from the normal).

Important Points:

- Normal is an imaginary line perpendicular (at 90°) to the mirror at the point of incidence
- Angles are always measured from the normal, not from the mirror surface
- If incident ray hits the mirror at 30° from normal, reflected ray will also be at 30° from normal
- These laws apply to reflection from all types of surfaces (not just plane mirrors)

Applications:

- Periscopes use these laws with two plane mirrors
- Kaleidoscope creates beautiful patterns using multiple reflections
- Rear-view mirrors in vehicles
- Dressing mirrors at home

1.5 marks for neat labeled diagram, 1.5 marks for stating both laws (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 3

Total Marks: 80

This is a comprehensive solved practice paper for Class 8 Science Annual Examination
(Set 3).

Most Expected Questions Based on Latest Syllabus 2025-26

Topics Covered: Crop Production | Microorganisms | Synthetic Fibres | Metals & Non-
metals | Coal & Petroleum | Combustion | Conservation | Cell Structure | Reproduction |
Adolescence | Friction | Force & Pressure | Sound | Light | Natural Phenomena |
Electricity

Study thoroughly and understand all concepts with diagrams.

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

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