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Global Innovator Olympiad (GIO)

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GLOBAL INNOVATOR OLYMPIAD (GIO)

8th: Syllabus

ENGLISH 20 Questions

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Crop Production and

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1. English

1.1 Tense

Tense indicates the time of an action or state of being. Understanding tense forms helps convey the correct time frame in writing and speech.

Key Tenses:

1. **Present Tense:** Indicates actions happening now.
 - o Example: She **writes** a letter.
2. **Past Tense:** Indicates actions that have already occurred.
 - o Example: He **wrote** a letter.
3. **Future Tense:** Indicates actions that will happen.
 - o Example: They **will write** a letter.

Questions:

1. Convert the following sentence to past tense: "She walks to school."
2. Write a sentence in future tense.
3. Identify the tense in this sentence: "They are playing soccer."
4. Provide an example of a sentence in simple present tense.

1.2 Narration (Direct - Indirect Speech)

Narration involves reporting what someone else has said. Understanding direct and indirect speech is crucial for conveying messages accurately.

Key Concepts:

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Direct Speech: Quoting the exact words spoken.

- o Example: She said, "I am coming."

Indirect Speech: Paraphrasing what was said without quoting directly.

- o Example: She said that she was coming.

Questions:

1. Convert the direct speech to indirect speech: "He said, „I am tired.”"
2. What is the difference between direct and indirect speech?
3. Rewrite this sentence in direct speech: She told me that she would help.
4. Convert this indirect speech to direct speech: The teacher said that we had to study.

1.3 Parts of Speech

Parts of speech are the building blocks of sentences, each serving a specific role. Understanding them is essential for constructing grammatically correct sentences.



Key Parts of Speech:

1. **Noun:** A person, place, thing, or idea.
o Example: Dog, city, happiness.
2. **Pronoun:** A word that replaces a noun.
o Example: He, she, it.
3. **Verb:** A word that expresses an action or state.
o Example: Run, is, think.
4. **Adverb:** A word that modifies a verb, adjective, or other adverbs.
o Example: Quickly, very, well.
5. **Adjective:** A word that describes a noun.
o Example: Beautiful, tall, red.

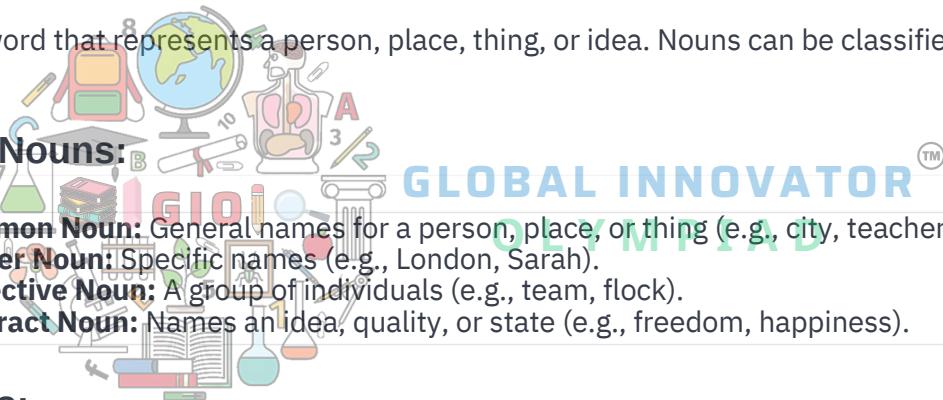
Questions:

1. Identify the part of speech for the word “happy.”
2. Write a sentence using a noun and an adjective.
3. Provide an example of a verb and an adverb in a sentence.
4. Explain the role of pronouns in a sentence.

1.4 Noun

A noun is a word that represents a person, place, thing, or idea. Nouns can be classified into various categories.

Types of Nouns:



1. **Common Noun:** General names for a person, place, or thing (e.g., city, teacher).
2. **Proper Noun:** Specific names (e.g., London, Sarah).
3. **Collective Noun:** A group of individuals (e.g., team, flock).
4. **Abstract Noun:** Names an idea, quality, or state (e.g., freedom, happiness).

Questions:

1. Identify the common noun in this sentence: “The dog barked at the stranger.”
2. Write a sentence using a proper noun.
3. Provide three examples of collective nouns.
4. Explain the difference between concrete and abstract nouns.

1.5 Pronoun

A pronoun is a word that takes the place of a noun to avoid repetition. Pronouns help make sentences clearer and more concise.

Types of Pronouns:

1. **Personal Pronouns:** Refer to specific people or things (e.g., I, you, he, she, it).
2. **Possessive Pronouns:** Indicate ownership (e.g., my, yours, his, hers).
3. **Demonstrative Pronouns:** Point to specific things (e.g., this, that, these, those).



4. **Interrogative Pronouns:** Used to ask questions (e.g., who, what, which).

Questions:

1. Replace the noun in this sentence with a pronoun: "Maria loves her cat."
2. Identify the possessive pronoun in this sentence: "This is my book."
3. Write a sentence using a demonstrative pronoun.
4. Provide an example of an interrogative pronoun in a question.

1.6 Verb

A verb is a word that expresses an action or a state of being. Understanding verbs is essential for constructing sentences.

Types of Verbs:

1. **Action Verbs:** Express physical or mental actions (e.g., run, think).
2. **Linking Verbs:** Connect the subject to a subject complement (e.g., am, is, are).
3. **Helping Verbs:** Assist the main verb in a sentence (e.g., has, will, can).

Questions:

1. Identify the verb in the following sentence: "She is singing beautifully."
2. Write a sentence using an action verb.
3. Provide an example of a linking verb in a sentence.
4. What is the function of helping verbs in a sentence?



1.7 Adverb

An adverb modifies a verb, adjective, or another adverb, providing more detail about how, when, where, or to what extent something happens.

Types of Adverbs:

1. **Adverb of Manner:** Describes how an action is performed (e.g., quickly, slowly).
2. **Adverb of Time:** Indicates when an action occurs (e.g., now, later).
3. **Adverb of Place:** Specifies where an action takes place (e.g., here, there).
4. **Adverb of Degree:** Describes the intensity or degree of an action or adjective (e.g., very, quite).

Questions:

1. Identify the adverb in the sentence: "He ran quickly to catch the bus."
2. Write a sentence using an adverb of time.
3. Provide an example of an adverb of place in a sentence.
4. Explain how adverbs enhance the meaning of verbs.

1.8 Adjective



An adjective is a word that describes or modifies a noun, providing more detail about it. Adjectives help make sentences more informative.

Types of Adjectives:

1. **Descriptive Adjectives:** Describe qualities or characteristics (e.g., beautiful, tall).
2. **Quantitative Adjectives:** Indicate quantity (e.g., few, many).
3. **Demonstrative Adjectives:** Point to specific nouns (e.g., this, that).
4. **Possessive Adjectives:** Show ownership (e.g., my, your).

Questions:

1. Identify the adjective in the sentence: “The tall building is impressive.”
2. Write a sentence using a demonstrative adjective.
3. Provide an example of a quantitative adjective in a sentence.
4. Explain the role of adjectives in enhancing the meaning of nouns.



2.Mathematics

1.1 Rational Numbers

Rational numbers are numbers that can be expressed as the quotient of two integers, where the denominator is not zero.

Key Concepts:

- Definition:** A rational number is in the form a/b , where a and b are integers and $b \neq 0$.
- Examples:** $1/2$, $-3/4$, 5 (which can be expressed as $5/1$).

Questions:

1. Identify three examples of rational numbers.
2. Is the number 0.75 a rational number? Explain.
3. Convert the improper fraction $9/4$ to a mixed number.
4. What is the sum of $1/3$ and $1/6$?

1.2 Linear Equation in One Variable

A linear equation in one variable is an equation that can be expressed in the form $ax + b = 0$, where x is the variable.

Key Concepts:

- Solving Linear Equations:** The process of finding the value of the variable that makes the equation true.

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Examples:

- Equation:** $2x + 5 = 13$
 - o **Solution:** $2x = 8 \rightarrow x = 4$

Questions:

1. Solve the equation: $3x - 7 = 2$.
2. What is the value of x in the equation: $5x + 3 = 18$?
3. Write a linear equation for the statement: "Twice a number is equal to 10."
4. Explain the steps to solve the equation: $4(x - 1) = 8$.

1.3 Understanding Quadrilaterals

A quadrilateral is a four-sided polygon with four angles. Understanding quadrilaterals helps in recognizing their properties and types.



Types of Quadrilaterals:

1. **Square:** All sides equal and angles are 90° .
2. **Rectangle:** Opposite sides equal and angles are 90° .
3. **Rhombus:** All sides equal but angles are not 90° .
4. **Trapezium:** At least one pair of parallel sides.

Questions:

1. Name the properties of a rectangle.
2. How does a square differ from a rhombus?
3. What is the sum of the interior angles of a quadrilateral?
4. Provide examples of quadrilaterals in real life.

1.4 Practical Geometry

Practical geometry involves constructing geometric figures using a compass, ruler, and protractor. It helps in understanding geometric concepts through hands-on practice.

Key Concepts:

- Construction of Angles:** Using a compass and ruler to create specific angles.
- Drawing Shapes:** Accurately creating shapes such as triangles and quadrilaterals.

Questions:

1. Describe the steps to construct a triangle given the lengths of its sides.
2. How do you draw a perpendicular bisector of a line segment?
3. What tools are commonly used in practical geometry?
4. Explain how to construct a 60° angle.

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1.5 Data Handling

Data handling involves collecting, organizing, and interpreting data. It is crucial for making informed decisions based on statistical information.

Key Concepts:

- Data Collection:** Gathering information from various sources.
- Organizing Data:** Arranging data in tables, charts, or graphs.
- Interpretation:** Analyzing and drawing conclusions from data.

Questions:

1. What are the different ways to represent data?
2. How can you organize data collected from a survey?
3. Create a simple bar graph using the following data: Number of pets (Dog: 5, Cat: 3, Fish: 2).
4. Explain the importance of data interpretation.



1.6 Squares and Square Roots

The square of a number is the result of multiplying that number by itself, while the square root is the value that, when multiplied by itself, gives the original number.

Key Concepts:

- Square:** If x is a number, then $x^2 = x * x$.
- Square Root:** \sqrt{x} is the number that gives x when multiplied by itself.

Questions:

1. What is the square of 8?
2. Calculate the square root of 64.
3. If the area of a square is 49 cm^2 , what is the length of one side?
4. Explain how to find the square root of a number using prime factorization.

1.7 Cubes and Cube Roots

A cube of a number is the result of multiplying that number by itself twice, while the cube root is the value that, when multiplied by itself twice, gives the original number.

Key Concepts:

- Cube:** If x is a number, then $x^3 = x * x * x$.
- Cube Root:** $\sqrt[3]{x}$ is the number that gives x when multiplied by itself twice.

Questions:

1. What is the cube of 5?
2. Calculate the cube root of 27.
3. If the volume of a cube is 64 cm^3 , what is the length of one edge?
4. Explain the relationship between cubes and cube roots.



1.8 Comparing Quantities

Comparing quantities involves determining the relationship between two or more amounts. It is essential for understanding ratios, proportions, and percentages.

Key Concepts:

- Ratio:** A comparison of two quantities by division.
- Proportion:** An equation that states that two ratios are equal.

Questions:

1. If the ratio of boys to girls in a class is 3:2, how many girls are there if there are 12 boys?
2. What is 25% of 200?
3. If 3 apples cost \$6, how much do 5 apples cost?
4. Explain how to solve problems involving proportions.



3.Science

1.1 Crop Production and Management

Crop production involves cultivating plants for food, fiber, and other products used to sustain and enhance human life. Management practices are essential for maximizing yield and ensuring sustainability.

Key Concepts:

- Types of Crops:**
 - o **Kharif Crops:** Grown during the monsoon (e.g., rice, maize).
 - o **Rabi Crops:** Grown in winter (e.g., wheat, barley).
- Agricultural Practices:**
 - o **Sowing:** Planting seeds at the right time and depth.
 - o **Irrigation:** Supplying water to crops.
 - o **Fertilization:** Adding nutrients to the soil.

Questions:

1. What are kharif and rabi crops? Give two examples of each.
2. Describe the importance of crop rotation in sustainable agriculture.
3. What methods can be used for irrigation?
4. Explain the role of fertilizers in crop production.

1.2 Micro-organisms: Friend and Foe

Micro-organisms are tiny living organisms that can be beneficial or harmful to humans, animals, and plants.

Key Concepts:

- Types of Micro-organisms:**
 - o **Bacteria:** Can be helpful (e.g., in fermentation) or harmful (e.g., causing diseases).
 - o **Fungi:** Used in food production (e.g., yeast) but can also cause infections.
 - o **Viruses:** Cause diseases in humans, animals, and plants.

Examples:

- Friendly Micro-organisms:** Lactobacillus (used in yogurt production).
- Harmful Micro-organisms:** Pathogenic bacteria like Salmonella.

Questions:

1. Name three types of micro-organisms and give examples of each.
2. How do micro-organisms contribute to food production?
3. What are some diseases caused by bacteria and viruses?



4. Explain the importance of hygiene in preventing the spread of harmful micro-organisms.

1.3 Coal and Petroleum

Coal and petroleum are fossil fuels formed from the remains of ancient organisms. They are vital energy sources but also pose environmental challenges.

Key Concepts:

- Formation:** Both coal and petroleum are formed over millions of years from the decomposition of organic matter under heat and pressure.
- Uses:**
 - o **Coal:** Used for electricity generation and steel production.
 - o **Petroleum:** Used for fuels (e.g., gasoline, diesel) and various chemicals.

Questions:

1. Describe the process of coal formation.
2. What are the environmental impacts of burning fossil fuels?
3. Explain the refining process of petroleum.
4. How do coal and petroleum contribute to energy production?

1.4 Conservation of Plants and Animals

Conservation involves protecting and managing natural resources, including plants and animals, to ensure biodiversity and ecological balance.



Key Concepts:

- Biodiversity:** The variety of plant and animal life in a particular habitat.
- Threats to Biodiversity:** Habitat destruction, pollution, climate change, and overexploitation.

Examples of Conservation Efforts:

- Protected Areas:** National parks and wildlife sanctuaries.
- Endangered Species Programs:** Efforts to protect species at risk of extinction.

Questions:

1. Why is biodiversity important for the environment?
2. What are some major threats to plant and animal life?
3. Describe one conservation method used to protect endangered species.
4. How do protected areas contribute to biodiversity conservation?

1.5 Combustion and Flame



Combustion is a chemical reaction that occurs when a substance reacts with oxygen to produce heat and light. Understanding combustion is essential for various applications, including energy production and safety.

Key Concepts:

Types of Combustion:

- o **Complete Combustion:** Occurs when there is sufficient oxygen (produces carbon dioxide and water).
- o **Incomplete Combustion:** Occurs with limited oxygen (produces carbon monoxide and soot).

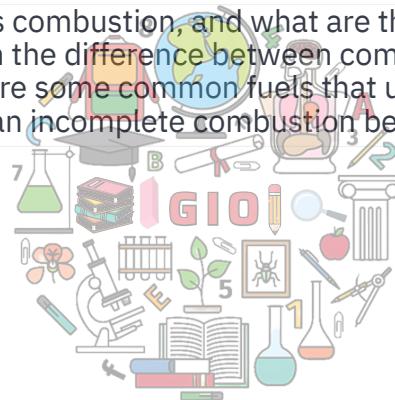
Examples:

Complete Combustion: Burning of natural gas (methane).

Incomplete Combustion: Burning of wood in low oxygen conditions.

Questions:

1. What is combustion, and what are the products of complete combustion?
2. Explain the difference between complete and incomplete combustion.
3. What are some common fuels that undergo combustion?
4. How can incomplete combustion be harmful to health?



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4. Social Science

1.1 Civics

The Indian Constitution

The Indian Constitution is the supreme law of India, outlining the framework for the political principles, procedures, and powers of government institutions, as well as the rights and duties of citizens.

Key Concepts:

- Fundamental Rights:** Rights guaranteed to all citizens (e.g., right to equality, right to freedom).
- Directive Principles of State Policy:** Guidelines for the state to ensure social and economic justice.

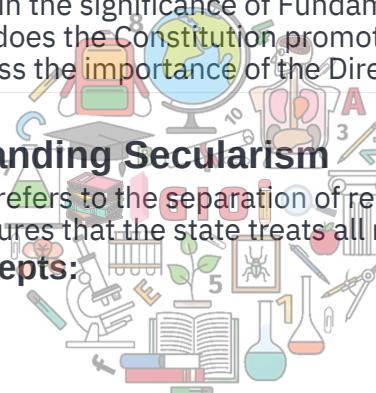
Questions:

1. What are the main features of the Indian Constitution?
2. Explain the significance of Fundamental Rights.
3. How does the Constitution promote equality among citizens?
4. Discuss the importance of the Directive Principles of State Policy.

Understanding Secularism

Secularism refers to the separation of religion from political, social, and educational institutions. In India, it ensures that the state treats all religions equally and does not favor any religion.

Key Concepts:



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- Religious Freedom:** The right to practice any religion or no religion.
- State Neutrality:** The government remains neutral in religious matters.

Questions:

1. Define secularism and explain its importance in India.
2. How does secularism contribute to social harmony?
3. Give examples of how the Indian Constitution protects religious freedom.
4. What challenges does secularism face in contemporary India?

Parliament and the Making of Laws

The Parliament of India is the supreme legislative body responsible for making laws. It consists of two houses: the Lok Sabha (House of the People) and the Rajya Sabha (Council of States).

Key Concepts:



- Legislative Process:** The procedure through which a bill becomes law, including introduction, debate, and voting.
- Role of Committees:** Committees analyze bills and report their recommendations.

Questions:

1. What are the two houses of Parliament in India?
2. Describe the process of how a bill becomes a law.
3. What is the role of parliamentary committees?
4. Explain the significance of the Lok Sabha and Rajya Sabha in law-making.

1.2 History

Introduction: How, When, and Where

History is the study of past events and their impact on the present. Understanding the context of historical events helps us learn from our past.

Key Concepts:

- Chronology:** The arrangement of events in the order they occurred.
- Sources of History:** Primary and secondary sources that provide information about the past.

Questions:

1. Why is it important to study history?
2. What are primary and secondary sources? Provide examples.
3. How do historians determine the reliability of historical sources?
4. Discuss the significance of chronology in historical studies.

From Trade to Territory: The Company Establishes Power

The transition from trade to territorial control by European companies, particularly the British East India Company, marked a significant shift in Indian history.

Key Concepts:

- Colonialism:** The practice of acquiring control over another country or territory.
- Expansion of British Power:** Methods used by the British to establish dominance in India.

Questions:

1. How did the British East India Company expand its influence in India?
2. What were the consequences of colonialism for India?
3. Describe the impact of trade on the establishment of British power.
4. Discuss the role of battles and treaties in the expansion of British control.



Ruling the Countryside

The British implemented various policies to govern rural areas in India, affecting agriculture and land ownership.

Key Concepts:

- Land Revenue Systems:** Methods used by the British to collect taxes from farmers.
- Impact on Farmers:** Changes in agricultural practices and land rights.

Questions:

1. Explain the land revenue systems introduced by the British.
2. How did these systems affect Indian farmers?
3. Discuss the role of zamindars in the rural economy.
4. What were the long-term effects of British policies on agriculture in India?

1.3 Geography

Resources

Resources are materials or substances that are useful to humans. Understanding different types of resources helps in their sustainable management.

Key Concepts:

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- Types of Resources:**
 - o **Natural Resources:** Materials provided by nature (e.g., water, minerals).
 - o **Human Resources:** The skills and knowledge of people.
 - o **Capital Resources:** Tools and machinery used in production.

Questions:

1. Define natural resources and provide examples.
2. What are the different types of resources? Explain each.
3. Why is resource management important for sustainable development?
4. Discuss the impact of resource depletion on the environment.

Land, Soil, Water, Natural Vegetation, and Wildlife Resources

These resources are essential for supporting life and human activities. Understanding their importance and interconnections is crucial for environmental conservation.

Key Concepts:

- Land Resources:** The area of land used for agriculture, forestry, and urban development.
- Soil Resources:** Essential for agriculture; soil quality affects crop production.
- Water Resources:** Vital for drinking, agriculture, and industry.



- Natural Vegetation:** Plants that grow naturally in an area; vital for biodiversity.
- Wildlife Resources:** Animals and their habitats; important for ecological balance.

Questions:

1. Explain the significance of soil in agriculture.
2. How do water resources impact human activities?
3. Discuss the importance of conserving natural vegetation and wildlife.
4. What challenges do land and water resources face in India?



5.Mental Ability

1.1 Number Series

Number series problems involve identifying patterns in a sequence of numbers. The objective is to determine the next number in the series based on the observed pattern.

Examples:

1. **Series:** 2, 4, 6, 8, ...
 - o **Pattern:** Each number increases by 2.
 - o **Next Number:** 10
2. **Series:** 5, 10, 20, 40, ...
 - o **Pattern:** Each number is multiplied by 2.
 - o **Next Number:** 80

Questions:

1. What is the next number in the series: 3, 6, 9, 12, ...?
2. Find the missing number in the series: 1, 4, __, 16, 25.
3. What is the next number in the series: 10, 20, 30, 40, ...?
4. Identify the pattern and find the next number: 2, 5, 10, 17, ...?

1.2 Alphabet Series

Alphabet series problems involve identifying patterns in sequences of letters. These problems test knowledge of the English alphabet and help in recognizing patterns.

Examples:

1. **Series:** A, C, E, G, ...
 - o **Pattern:** Each letter is two places ahead in the alphabet.
 - o **Next Letter:** I
2. **Series:** Z, Y, X, W, ...
 - o **Pattern:** The letters are in reverse order.
 - o **Next Letter:** V

Questions:

1. What is the next letter in the series: B, D, F, H, ...?
2. Find the missing letter in the series: A, C, __, E, G.
3. Identify the pattern and find the next letter: K, M, O, Q, ...?
4. What letter comes next in the series: X, W, V, U, ...?

1.3 Alphabet Test

Alphabet tests involve determining the position of letters in the English alphabet or finding relationships between different letters.

Examples:

1. **Position:** A = 1, B = 2, C = 3, ...
 - o **Question:** What is the position of the letter D?
□ **Answer:** 4
2. **Reverse Position:** Z = 1, Y = 2, X = 3, ...
 - o **Question:** What is the reverse position of the letter A?
□ **Answer:** 26

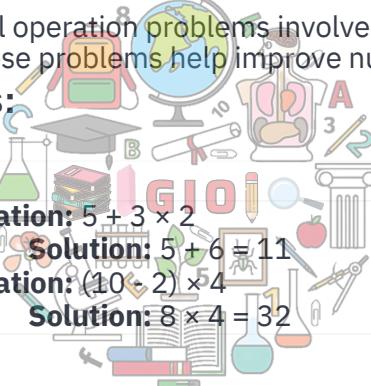
Questions:

1. What is the position of the letter F in the English alphabet?
2. If A = 1, what is the sum of the positions of the letters A, B, and C?
3. What is the reverse position of the letter M?
4. Find the letter that is 3 positions after J in the alphabet.

1.4 Mathematical Operations

Mathematical operation problems involve performing calculations based on given instructions or patterns. These problems help improve numerical skills and logical thinking.

Examples:

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1. **Operation:** $5 + 3 \times 2$
 - o **Solution:** $5 + 6 = 11$
 2. **Operation:** $(10 - 2) \times 4$
 - o **Solution:** $8 \times 4 = 32$

Questions:

1. Solve: $6 + 4 \times 3 - 2$.
2. What is the result of $15 \div 3 + 5 \times 2$?
3. If you subtract 7 from 20 and then multiply the result by 3, what do you get?
4. Calculate: $(12 - 4) \div 2 + 5 \times 3$.

1.5 Coding-Decoding

Coding-decoding problems involve substituting letters or words based on a specific rule. These exercises test logical reasoning and pattern recognition.

Examples:

1. **Code:** If A = 1, B = 2, C = 3, what is the code for the word "CAT"?
 - o **Solution:** C = 3, A = 1, T = 20 → Code = 3-1-20.
2. **Code:** If "DOG" is coded as "GOL," how is "CAT" coded?



- o **Solution:** Each letter is reversed → CAT → TAC.

Questions:

1. If A = 2, B = 4, C = 6, what is the code for “CAB”?
2. How would you code the word “FISH” if each letter is shifted by +1?
3. If “RAIN” is coded as “SBOJ,” what is the code for “SUN”?
4. Decode the following: If M = 13, N = 14, O = 15, what does “MON” equal?

1.6 Direction Sense

Direction sense problems involve understanding and interpreting directional information. These exercises test spatial awareness and reasoning.

Examples:

1. If you face north and turn 90° to the right, which direction are you facing?
 - o **Answer:** East.
2. You walk 10 meters south, then turn left and walk 5 meters. In which direction are you now?
 - o **Answer:** East.

Questions:

If you are facing west and turn 180°, which direction are you facing now?
You walk 5 km north, then 3 km east. How far are you from your starting point?
If you go south from your house, turn right, and then go east, which direction are you facing now?
A person walks 2 km north and then 2 km east. What is the shortest distance back to the starting point?

1.7 Analogy

Analogy problems involve comparing two different things to highlight their similarities. These exercises test logical reasoning and relationship understanding.

Examples:

1. **Analogy:** Dog is to Bark as Cat is to __?
 - o **Answer:** Meow.
2. **Analogy:** Tree is to Forest as Star is to __?
 - o **Answer:** Galaxy.

Questions:

1. Bird is to Fly as Fish is to __?
2. Teacher is to School as Doctor is to __?
3. Sun is to Day as Moon is to __?
4. Book is to Read as Song is to __?

