

NOTES ON:

Logical Reasoning and

Data Interpretation

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A. Introduction to Logical Reasoning & Data Interpretation

Logical reasoning is an essential skill that underpins much of our decision-making process, problem-solving abilities, and critical thinking. It involves evaluating arguments, identifying patterns, deducing conclusions from premises, and effectively reasoning under uncertainty. This comprehensive guide explores the facets of logical reasoning, its importance, types, applications, and tips for enhancing this vital skill.

a) What is Logical Reasoning?

Logical reasoning refers to the process of using a structured, methodical approach to arrive at conclusions or solve problems based on given premises or evidence. It is the foundation of critical thinking, enabling individuals to analyze information, deduce conclusions, solve problems, and make decisions based on logic rather than assumptions or emotions.

b) Importance of Logical Reasoning

Logical reasoning is crucial in every aspect of life. It allows individuals to:

- ✓ **Make Informed Decisions:** By evaluating information logically, individuals can make better, more informed decisions.
- ✓ **Solve Problems Effectively:** Logical reasoning helps identify the root causes of problems and find effective solutions.
- ✓ **Critical Thinking:** It fosters the ability to question assumptions, evaluate arguments, and distinguish between valid and invalid inferences.
- ✓ **Communication:** Logical reasoning enhances the ability to construct coherent arguments and communicate ideas effectively.

c) Types of Logical Reasoning

✓ Deductive Reasoning

Deductive reasoning involves drawing specific conclusions from general principles or premises. If the premises are true, the conclusion must also be true. It is often structured in the form of "if-then" statements and syllogisms.

✓ Inductive Reasoning

Inductive reasoning involves making generalizations based on specific observations or evidence. The conclusions reached are probable, with the strength of the conclusion depending on the strength of the evidence.

✓ Abductive Reasoning

Abductive reasoning starts with an incomplete set of observations and proceeds to the likeliest possible explanation. It is often used in diagnostic processes and hypothesis formation.

d) Applications of Logical Reasoning

Logical reasoning applies broadly across various fields, including:

- ✓ **Mathematics and Science:** For proving theorems, solving equations, and conducting experiments.
- ✓ **Law:** In constructing arguments, interpreting legislation, and judicial decision-making.
- ✓ **Everyday Life:** From critical thinking about news articles to making personal finance decisions.
- ✓ **Technology and Engineering:** In designing algorithms, troubleshooting systems, and developing new technologies.

e) Enhancing Logical Reasoning Skills

Improving your logical reasoning skills involves practice and a mindful approach to thinking. Here are some tips:

- ✓ **Engage in Brain-Training Activities:** Puzzles, logic games, and brain teasers can sharpen your reasoning skills.
- ✓ **Read Critically:** Analyze arguments in books, articles, and debates critically. Identify premises, conclusions, and the validity of arguments.
- ✓ **Practice Problem-Solving:** Regularly engage in problem-solving activities, both in professional and personal contexts.
- ✓ **Reflect on Your Thinking Process:** Regularly question your assumptions and the logic behind your conclusions.
- ✓ **Learn Formal Logic:** Understanding the formal structures of logical arguments can improve your ability to reason logically.

f) Conclusion

Logical reasoning is a fundamental skill that enhances our ability to think critically, solve problems, and make informed decisions. By understanding its types, importance, and applications, and actively working to improve our logical reasoning skills, we can better navigate the complexities of the world around us. Whether through formal study, practical application, or engaging in activities that challenge our cognitive processes, enhancing our logical reasoning capabilities is a lifelong journey that pays dividends in every aspect of our lives.

A.1 Verbal and Non-verbal Logical Reasoning

Verbal and non-verbal reasoning are two distinct types of cognitive assessments used to evaluate different aspects of an individual's intelligence and problem-solving abilities. Here is a detailed comparison of the two in tabular form:

Aspect	Verbal Reasoning	Non-Verbal Reasoning
Definition	Involves the ability to understand and reason using concepts framed in words.	Involves the ability to understand and reason with visual information and solve problems using visual logic.
Skills Tested	Language understanding, vocabulary, grammar, comprehension, critical reasoning, and the ability to follow detailed written instructions.	Spatial awareness, pattern recognition, shape visualization, the ability to understand and analyze visual data, and geometric intuition.
Types of Questions	Analogies, sentence completion, critical reasoning arguments, text comprehension, syllogisms, and classification.	Sequence of figures, mirror images, paper folding and cutting, shape construction, and figure matrix.
Nature of Content	Text-based content including words and sentences.	Content includes images, patterns, shapes, and diagrams.
Required Abilities	Strong command of the language, reading comprehension, and logical thinking.	Spatial orientation, visual perception, and abstract reasoning.
Usage	Used to assess verbal logic and the ability to understand and process written information.	Used to assess the ability to process and understand visual information without relying on textual content.
Examples of Application	Verbal reasoning is commonly used in language-heavy fields such as law, literature, and humanities.	Non-verbal reasoning is crucial in fields requiring spatial understanding, such as engineering, architecture, and visual arts.
Test Format	Typically presented in the form of reading passages, sentences, or verbal analogies.	Presented in the form of puzzles, diagrams, or sequences of figures that require visual manipulation.
Purpose	To evaluate linguistic and verbal communication skills, logical reasoning with words, and the ability to extract information from complex texts.	To evaluate the ability to think critically and solve problems without linguistic information, focusing on spatial and visual reasoning.

Both verbal and non-verbal reasoning play significant roles in cognitive assessment and are valued differently across various academic, professional, and everyday contexts. Mastery of both types of reasoning is beneficial for a well-rounded cognitive skill set.

A.1.1 Importance of Verbal and Non-verbal Reasoning

Verbal and non-verbal reasoning are pivotal components of the Logical Reasoning subject and hold substantial importance in competitive examinations. Their relevance spans across various domains, testing a range of cognitive abilities that are crucial for academic and professional success. Here's an overview of their importance:

a) Importance in Logical Reasoning Subject

- ✓ **Cognitive Skill Development:** Both verbal and non-verbal reasoning contribute significantly to the development of critical thinking, problem-solving, and analytical skills. These are essential cognitive abilities that students are expected to master in logical reasoning subjects.
- ✓ **Comprehensive Evaluation:** Verbal reasoning assesses language understanding, comprehension, and logical thinking using words, while non-verbal reasoning evaluates spatial awareness, pattern recognition, and problem-solving through visual information. Together, they offer a comprehensive evaluation of a student's reasoning abilities.
- ✓ **Application in Real-life Scenarios:** Logical reasoning, encompassing both verbal and non-verbal aspects, teaches students how to apply logic to various real-life situations, enhancing decision-making and problem-solving skills.

b) Importance for Competitive Examinations

- ✓ **Widely Used in Testing Formats:** Verbal and non-verbal reasoning are integral parts of most competitive exams, including entrance tests for universities, job recruitment assessments, and professional qualification exams. They are used to gauge a candidate's potential beyond academic knowledge, focusing on their ability to think logically and solve problems efficiently.
- ✓ **Indicator of Intellectual Abilities:** These sections are considered strong indicators of a candidate's intellectual capabilities and potential for success in complex academic or professional environments. They test the ability to process information, draw conclusions, and make logical decisions under time constraints.
- ✓ **Versatility and Non-Disciplinary Bias:** Unlike subject-specific tests, verbal and non-verbal reasoning do not require specialized knowledge in any particular field, making them a fair measure of intelligence and reasoning ability across disciplines.
- ✓ **Predictive of Future Performance:** Performance in verbal and non-verbal reasoning tests is often correlated with success in academic and professional settings. These tests are designed to predict an individual's aptitude for learning, problem-solving, and adapting to new challenges.

c) Strategies for Competitive Exams

- ✓ **Regular Practice:** Success in verbal and non-verbal reasoning sections requires regular practice. Familiarity with the types of questions and practice in time management can significantly improve performance.
- ✓ **Skill Enhancement:** Building up vocabulary, reading comprehension skills, and spatial awareness through targeted exercises can enhance reasoning abilities.
- ✓ **Mock Tests:** Taking mock tests helps in understanding the exam format, identifying weaknesses, and improving speed and accuracy under exam conditions.

In conclusion, verbal and non-verbal reasoning are fundamental to logical reasoning education and crucial for excelling in competitive examinations. Mastery of these areas signifies well-rounded cognitive abilities, critical for academic achievement and professional success in a wide range of fields.

Section-1

Logical Reasoning

B. Types of Problems in Verbal Reasoning

Class-1: Number Series

Logical reasoning is a critical aspect of various competitive exams, interviews, and cognitive assessments. It tests an individual's ability to use structured thinking to solve complex problems, often under time constraints. Among the many types of logical reasoning questions, number series questions are particularly common. These questions assess a person's ability to identify patterns, sequences, and relationships between numbers.

Understanding number series and its types is essential for anyone looking to excel in logical reasoning tests. This article delves into the intricacies of number series, exploring its significance, different types, and strategies for solving them effectively.

a) Understanding Number Series

A number series is a sequence of numbers arranged in a specific order, where the numbers follow a certain pattern or rule. The challenge lies in deciphering this underlying rule to predict the next numbers in the series, find missing numbers, or identify numbers that do not fit the pattern. These questions evaluate mathematical aptitude, pattern recognition, and analytical thinking skills.

b) Types of Number Series

Number series can be broadly categorized into several types, each with its distinct pattern or logic. Recognizing the type of series is the first step in solving these questions. Here are some common types:

- ✓ **Arithmetic Series:** In an arithmetic series, each number differs from the next by a constant amount (positive or negative). This difference is known as the common difference. For example, in the series 2, 4, 6, 8, the numbers increase by 2.
- ✓ **Geometric Series:** A geometric series is one where each term after the first is found by multiplying the previous one by a fixed, non-zero number called the common ratio. For example, in the series 2, 4, 8, 16, each number is multiplied by 2.
- ✓ **Fibonacci Series:** This series is formed by adding the two preceding numbers to get the next number. An example is 0, 1, 1, 2, 3, 5, 8, where each number is the sum of the two preceding numbers.
- ✓ **Alternating Series:** These series alternate between different sequences or operations. For example, an alternating series could involve alternating addition and subtraction, or alternating between two different arithmetic or geometric series.
- ✓ **Complex Series:** These involve a combination of mathematical operations or more complex patterns, including the incorporation of letters or symbols. Deciphering these patterns requires a deep understanding of mathematical principles and keen analytical skills.

c) Solving Strategies

To effectively tackle number series questions, consider the following strategies:

- ✓ **Identify the Pattern:** Start by looking for simple arithmetic or geometric relationships between the numbers. Check for common differences or ratios.
- ✓ **Consider Multiple Operations:** Some series might involve more than one mathematical operation. Look for patterns involving addition, subtraction, multiplication, division, or a combination of these.
- ✓ **Look for Alternating Patterns:** If the series does not fit simple arithmetic or geometric rules, it might be alternating between different patterns.
- ✓ **Analyze Position:** Sometimes, the pattern relates to the position of the numbers in the series. This is common in complex series or those involving letters and numbers.
- ✓ **Practice Regularly:** Familiarity with a wide range of patterns is crucial. Regular practice can significantly improve pattern recognition skills.

d) Conclusion

Number series questions are a staple of logical reasoning tests, challenging one's ability to recognize and extrapolate patterns. Understanding the different types of number series and mastering various solving strategies are key to excelling in these questions. Regular practice, combined with a strategic approach to identifying patterns, can enhance one's logical reasoning skills and performance in competitive settings.

Type-1

1. Look at this series: 2, 1, (1/2), (1/4), ... What number should come next?

- (A) (1/3)
- (B) (1/8)
- (C) (2/8)
- (D) (1/16)

Answer: Option (B)

Explanation:

This is a simple division series; each number is one-half of the previous number.

In other terms to say, the number is divided by 2 successively to get the next result.

$$4/2 = 2 \quad 2/2 = 1 \quad 1/2 = 1/2 \quad (1/2)/2 = 1/4 \quad (1/4)/2 = 1/8 \text{ and so on.}$$

2. Look at this series: 7, 10, 8, 11, 9, 12, ... What number should come next?

- (A) 7
- (B) 10
- (C) 12
- (D) 13

Answer: Option (B)

Explanation:

This is a simple alternating addition and subtraction series. In the first pattern, 3 is added; in the second, 2 is subtracted.

3. Look at this series: 36, 34, 30, 28, 24, ... What number should come next?

- (A) 20
- (B) 22
- (C) 23
- (D) 26

Answer: Option (B)

Explanation:

This is an alternating number subtraction series. First, 2 is subtracted, then 4, then 2, and so on.

4. Look at this series: 22, 21, 23, 22, 24, 23, ... What number should come next?

- (A) 22
- (B) 24
- (C) 25
- (D) 26

Answer: Option (C)

Explanation:

In this simple alternating subtraction and addition series; 1 is subtracted, then 2 is added, and so on.

5. Look at this series: 53, 53, 40, 40, 27, 27, ... What number should come next?

- (A) 12
- (B) 14
- (C) 27
- (D) 53

Answer: Option (B)

Explanation:

In this series, each number is repeated, then 13 is subtracted to arrive at the next number.

6. Look at this series: 21, 9, 21, 11, 21, 13, 21, ... What number should come next?

- (A) 14
- (B) 15
- (C) 21
- (D) 23

Answer: Option (B)

Explanation:

In this alternating repetition series, the random number 21 is interpolated every other number into an otherwise simple addition series that increases by 2, beginning with the number 9.

7. Look at this series: 58, 52, 46, 40, 34, ... What number should come next?

- (A) 26
- (B) 28
- (C) 30
- (D) 32

Answer: Option (B)

Explanation:

This is a simple subtraction series. Each number is 6 less than the previous number.

8. Look at this series: 3, 4, 7, 8, 11, 12, ... What number should come next?

- (A) 7
- (B) 10
- (C) 14
- (D) 15

Answer: Option (D)

Explanation:

This alternating addition series begins with 3; then 1 is added to give 4; then 3 is added to give 7; then 1 is added, and so on.

9. Look at this series: 8, 22, 8, 28, 8, ... What number should come next?

- (A) 9
- (B) 29
- (C) 32
- (D) 34

Answer: Option (D)

Explanation:

This is a simple addition series with a random number, 8, interpolated as every other number. In the series, 6 is added to each number except 8, to arrive at the next number.

10. Look at this series: 31, 29, 24, 22, 17, ... What number should come next?

- (A) 15
- (B) 14
- (C) 13
- (D) 12

Answer: Option (A)

Explanation:

This is a simple alternating subtraction series, which subtracts 2, then 5.

Type-2

► Directions to Solve

Look carefully for the pattern, and then choose which pair of numbers comes next.

1. 28 25 5 21 18 5 14

(A) 11 5

(B) 10 7

(C) 11 8

(D) 5 10

(E) 10 5

Answer: Option (A)

Explanation:

This is an alternating subtraction series with the interpolation of a random number, 5, as every third number. In the subtraction series, 3 is subtracted, then 4, then 3, and so on.

2. 8 11 21 15 18 21 22

(A) 25 18

(B) 25 21

(C) 25 29

(D) 24 21

(E) 22 26

Answer: Option (B)

Explanation:

This is an alternating addition series, with a random number, 21, interpolated as every third number. The addition series alternates between adding 3 and adding 4. The number 21 appears after each number arrived at by adding 3.

3. 9 16 23 30 37 44 51

(A) 59 66

(B) 56 62

(C) 58 66

(D) 58 65

(E) 54 61

Answer: Option (D)

Explanation:

Here is a simple addition series, which begins with 9 and adds 7.

4. 2 8 14 20 26 32 38

(A) 2 46

(B) 44 50

(C) 42 48

(D) 40 42

(E) 32 26

Answer: Option (B)

Explanation:

This is a simple addition series, which begins with 2 and adds 6.

5. 9 11 33 13 15 33 17

(A) 19 33

(B) 33 35

(C) 33 19

(D) 15 33

(E) 19 21

Answer: Option (A)

Explanation:

In this alternating repetition series, a random number, 33, is interpolated every third number into a simple addition series, in which each number increases by 2.

6. 2 3 4 5 6 4 8

(A) 9 10

(B) 4 8

(C) 10 4

(D) 9 4

(E) 8 9

Answer: Option (D)

Explanation:

This is an alternating addition series with a random number, 4, interpolated as every third number. In the main series, 1 is added, then 2 is added, then 1, then 2, and so on.

7. 17 17 34 20 20 31 23

(A) 26 23

(B) 34 20

(C) 23 33

(D) 27 28

(E) 23 28

Answer: Option (E)

Explanation:

This is an alternating subtraction series with repetition. There are two different patterns here. In the first, a number repeats itself; then 3 is added to that number to arrive at the next number, which also repeats. This gives the series 17, 17, 20, 20, 23, and so on. Every third number follows a second pattern, in which 3 is subtracted from each number to arrive at the next: 34, 31, 28.

8. 6 20 8 14 10 8 12

(A) 14 10

(B) 2 18

(C) 4 12

(D) 2 14

(E) 14 14

Answer: Option (D)

Explanation:

This is an alternating addition and subtraction series. In the first pattern, 2 is added to each number to arrive at the next; in the alternate pattern, 6 is subtracted from each number to arrive at the next.

9. 21 25 18 29 33 18

(A) 43 18

(B) 41 44

(C) 37 18

(D) 37 41

(E) 38 41

Answer: Option (D)

Explanation:

This is a simple addition series with a random number, 18, interpolated as every third number. In the series, 4 is added to each number except 18, to arrive at the next number.

10. 75 65 85 55 45 85 35

(A) 25 15

(B) 25 85

(C) 35 25

(D) 85 35

(E) 25 75

Answer: Option (B)

Explanation:

This is a simple subtraction series in which a random number, 85, is interpolated as every third number. In the subtraction series, 10 is subtracted from each number to arrive at the next.

Type-3

► Directions to Solve

Look carefully for the pattern, and then choose which pair of numbers comes next.

1. 42 40 38 35 33 31 28

(A) 25 22

(B) 26 23

(C) 26 24

(D) 25 23

(E) 26 22

Answer: Option (C)

Explanation:

This is an alternating subtraction series in which 2 is subtracted twice, then 3 is subtracted once, then 2 is subtracted twice, and so on.

2. 6 10 14 18 22 26 30

(A) 36 40

(B) 33 37

(C) 38 42

(D) 34 36

(E) 34 38

Answer: Option (E)

Explanation:

This simple addition series adds 4 to each number to arrive at the next.

3. 8 12 9 13 10 14 11

(A) 14 11

(B) 15 12

(C) 8 15

(D) 15 19

(E) 8 5

Answer: Option (B)

Explanation:

This is an alternating addition and subtraction series, in which the addition of 4 is alternated with the subtraction of 3.

4. 36 31 29 24 22 17 15

(A) 13 11

(B) 10 5

(C) 13 8

(D) 12 7

(E) 10 8

Answer: Option (E)

Explanation:

This is an alternating subtraction series, which subtracts 5, then 2, then 5, and so on.

5. 3 5 35 10 12 35 17

- (A) 22 35
- (B) 35 19
- (C) 19 35
- (D) 19 24
- (E) 22 24

Answer: Option (C)

Explanation:

This is an alternating addition series, with a random number, 35, interpolated as every third number. The pattern of addition is to add 2, add 5, add 2, and so on. The number 35 comes after each "add 2" step/

6. 13 29 15 26 17 23 19

- (A) 21 23
- (B) 20 21
- (C) 20 17
- (D) 25 27
- (E) 22 20

Answer: Option (B)

Explanation:

Here, there are two alternating patterns, with every other number following a different pattern. The first pattern begins with 13 and adds 2 to each number to arrive at the next; the alternating pattern begins with 29 and subtracts 3 each time.

7. 14 14 26 26 38 38 50

(A) 60 72

(B) 50 62

(C) 50 72

(D) 62 62

(E) 62 80

Answer: Option (B)

Explanation:

In this simple addition with repetition series, each number in the series repeats itself, and then increases by 12 to arrive at the next number.

8. 44 41 38 35 32 29 26

(A) 24 21

(B) 22 19

(C) 23 19

(D) 29 32

(E) 23 20

Answer: Option (E)

Explanation:

This is a simple subtraction series, in which 3 is subtracted from each number to arrive at the next.

9. 34 30 26 22 18 14 10

(A) 8 6

(B) 6 4

(C) 14 18

(D) 6 2

(E) 4 0

Answer: Option (D)

Explanation:

This is a simple subtraction series, in which 4 is subtracted from each number to arrive at the next.

10. 32 31 32 29 32 27 32

(A) 25 32

(B) 31 32

(C) 29 32

(D) 25 30

(E) 29 30

Answer: Option (A)

Explanation:

This is an alternating repetition series. The number 32 alternates with a series in which each number decreases by 2.

Type-4

► Directions to Solve

Find the number that fits somewhere into the middle of the series. Some of the items involve both numbers and letters

1. Look at this series: F2, __, D8, C16, B32, ... What number should fill the blank?

- (A) A16
- (B) G4
- (C) E4
- (D) E3

Answer: Option (C)

Explanation:

The letters decrease by 1; the numbers are multiplied by 2.

2. Look at this series: 664, 332, 340, 170, ___, 89, ... What number should fill the blank?

- (A) 85
- (B) 97
- (C) 109
- (D) 178

Answer: Option (D)

Explanation:

This is an alternating division and addition series: First, divide by 2, and then add 8.

3. Look at this series: V, VIII, XI, XIV, __, XX, ... What number should fill the blank?

- (A) IX
- (B) XXIII
- (C) XV
- (D) XVII

Answer: Option (D)

Explanation:

This is a simple addition series; each number is 3 more than the previous number.

4. Look at this series: 70, 71, 76, __, 81, 86, 70, 91, ... What number should fill the blank?

- (A) 70
- (B) 71
- (C) 80
- (D) 96

Answer: Option (A)

Explanation:

In this series, 5 is added to the previous number; the number 70 is inserted as every third number.

5. Look at this series: 8, 43, 11, 41, __, 39, 17, ... What number should fill in the blank?

- (A) 8
- (B) 14
- (C) 43
- (D) 44

Answer: Option (B)

Explanation:

This is a simple alternating addition and subtraction series. The first series begins with 8 and adds 3; the second begins with 43 and subtracts 2.

6. Look at this series: VI, 10, V, 11, __, 12, III, ... What number should fill the blank?

- (A) II
- (B) IV
- (C) IX
- (D) 14

Answer: Option (B)

Explanation:

This is an alternating addition and subtraction series. Roman numbers alternate with Arabic numbers. In the Roman numeral pattern, each number decreases by 1. In the Arabic numeral pattern, each number increases by 1.

7. Look at this series: $(1/9)$, $(1/3)$, 1, __, 9, ... What number should fill the blank?

- (A) $(2/3)$
- (B) 3
- (C) 6
- (D) 27

Answer: Option (B)

Explanation:

This is a multiplication series; each number is 3 times the previous number.

9. Look at this series: 15, __, 27, 27, 39, 39, ... What number should fill the blank?

- (A) 51
- (B) 39
- (C) 23
- (D) 15

Answer: Option (D)

Explanation:

In this simple addition with repetition series, each number in the series repeats itself, and then increases by 12 to arrive at the next number.

10. Look at this series: 72, 76, 73, 77, 74, __, 75, ... What number should fill the blank?

(A) 70

(B) 71

(C) 75

(D) 78

Answer: Option (D)

Explanation:

This series alternates the addition of 4 with the subtraction of 3.

Class 2: Letter and Symbol Series in Logical Reasoning

In logical reasoning, letter and symbol series questions are designed to test a candidate's ability to recognize patterns, sequences, and relationships not just among numbers, but also among letters and symbols. These types of questions require an individual to analyze and deduce the underlying rules governing the arrangement of letters and symbols in a series. Understanding how to approach these series is crucial for excelling in logical reasoning tests, which often feature in competitive exams, entrance tests, and aptitude assessments. This section outlines the theory behind letter and symbol series, offering insights into identifying patterns and solving these types of questions effectively.

a) Letter Series

A letter series consists of sequences of letters arranged in a specific pattern. The challenge lies in identifying the rule that dictates the sequence to predict the next letters or to fill in missing ones. Letter series can involve simple patterns, such as alphabetical order or a repeating sequence, and more complex patterns that incorporate skips, reversals, or a combination of different operations.

b) Key Concepts:

- ✓ **Alphabetical Sequence:** Simple series may follow the alphabetical order directly or with a constant skip pattern.
- ✓ **Repetition:** Some series are based on the repetition of a group of letters.
- ✓ **Alternation:** Alternating patterns between two or more sequences of letters.
- ✓ **Reversal:** Some series involve reversing the order of letters at regular intervals.
- ✓ **Complex Patterns:** Involves a combination of operations, including shifts, skips, and reversals.

c) Symbol Series

Symbol series questions involve sequences of symbols following a certain rule or pattern. The complexity of symbol series ranges from straightforward sequences to intricate patterns that require deep analysis. The symbols may represent mathematical operations, geometric shapes, or any abstract symbols. Understanding the pattern involves recognizing how the symbols change from one position to the next in the sequence.

d) Key Concepts:

- ✓ **Sequential Change:** Symbols may change in a clear sequence, such as rotating or flipping at each step.
- ✓ **Addition/Removal:** Symbols might be added or removed according to a specific rule.
- ✓ **Transformation:** Symbols could transform into other symbols based on a set pattern.

- ✓ **Combination:** Patterns may involve a combination of changing positions, transformations, and addition/removal of symbols.

e) Strategies for Solving Letter and Symbol Series

Identify the Pattern: Start by looking for the simplest pattern, whether it's an alphabetical sequence, rotation, or transformation.

- ✓ **Analyze the Changes:** Note how letters or symbols change from one position to the next. This includes direction, frequency, and type of change.
- ✓ **Look for Repetition:** Many series are based on a repeating cycle. Determine the length of the cycle to predict future elements.
- ✓ **Consider Multiple Patterns:** Some series may involve more than one pattern. Analyze each element's position to uncover overlapping patterns.
- ✓ **Practice Regularly:** Familiarity with a wide range of letter and symbol patterns is crucial for quick recognition and solution.

Type-1

► Directions to Solve

In these series, you will be looking at both the letter pattern and the number pattern. Fill the blank in the middle of the series or end of the series.

1. SCD, TEF, UGH, ___, WKL

- (A) CMN
- (B) UJI
- (C) VIJ
- (D) IJT

Answer: Option (C)

Explanation:

There are two alphabetical series here. The first series is with the first letters only: STUVW. The second series involves the remaining letters: CD, EF, GH, IJ, KL.

2. B_2CD , ____, BCD_4 , B_5CD , BC_6D

(A) B_2C_2D

(B) BC_3D

(C) B_2C_3D

(D) BCD_7

Answer: Option (B)

Explanation:

Because the letters are the same, concentrate on the number series, which is a simple 2, 3, 4, 5, 6 series, and follows each letter in order.

3. FAG, GAF, HAI, IAH, ____

(A) JAK

(B) HAL

(C) HAK

(D) JAI

Answer: Option (A)

Explanation:

The middle letters are static, so concentrate on the first and third letters. The series involves an alphabetical order with a reversal of the letters. The first letters are in alphabetical order: F, G, H, I, J. The second and fourth segments are reversals of the first and third segments. The missing segment begins with a new letter.

4. ELFA, GLHA, ILJA, ____, MLNA

- (A) OLPA
- (B) KLMA
- (C) LLMA
- (D) KLLA

Answer: Option (D)

Explanation:

The second and forth letters in the series, L and A, are static. The first and third letters consist of an alphabetical order beginning with the letter E.

5. CMM, EOO, GQQ, ____, KUU

- (A) GRR
- (B) GSS
- (C) ISS
- (D) ITT

Answer: Option (C)

Explanation:

The first letters are in alphabetical order with a letter skipped in between each segment: C, E, G, I, K. The second and third letters are repeated; they are also in order with a skipped letter: M, O, Q, S, U.

6. ZA₅, Y₄B, XC₆, W₃D, ____

- (A) E₇V
- (B) V₂E
- (C) VE₅
- (D) VE₇

Answer: Option (D)

Explanation:

There are three series to look for here. The first letters are alphabetical in reverse: Z, Y, X, W, V. The second letters are in alphabetical order, beginning with A. The number series is as follows: 5, 4, 6, 3, 7.

7. QPO, NML, KJI, ____, EDC

- (A) HGF
- (B) CAB
- (C) JKL
- (D) GHI

Answer: Option (A)

Explanation:

This series consists of letters in a reverse alphabetical order.

8. JAK, KBL, LCM, MDN, ____

- (A) OEP
- (B) NEO
- (C) MEN
- (D) PFQ

Answer: Option (B)

Explanation:

This is an alternating series in alphabetical order. The middle letters follow the order ABCDE. The first and third letters are alphabetical beginning with J. The third letter is repeated as a first letter in each subsequent three-letter segment.

9. BCB, DED, FGF, HIH, ____

- (A) JKJ
- (B) HJH
- (C) IJI
- (D) JHJ

Answer: Option (A)

Explanation:

This series consists of a simple alphabetical order with the first two letters of all segments: B, C, D, E, F, G, H, I, J, K. The third letter of each segment is a repetition of the first letter.

10. P₅QR, P₄QS, P₃QT, ____, P₁QV

(A) PQW

(B) PQV₂

(C) P₂QU

(D) PQ₃U

Answer: Option (C)

Explanation:

The first two letters, PQ, are static. The third letter is in alphabetical order, beginning with R. The number series is in descending order beginning with 5.

Type-2

► Directions to Solve

Look carefully at the sequence of symbols to find the pattern. Select correct pattern.

1. EmE|m m m m | E w E | w ? w

m E w E
(1) (2) (3) (4)

(A) 1

(B) 2

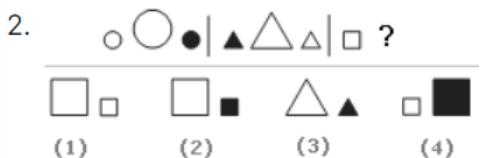
(C) 3

(D) 4

Answer: Option (C)

Explanation:

This is an alternating series. In the first segment, the letter "E" faces right, then down, then right. In the second segment, the letters all face down. To follow this pattern, in the fourth segment, the letters must all face up.



(A) 1

(B) 2

(C) 3

(D) 4

Answer: Option **(B)**

Explanation:

Notice that in each segment, the figures are all the same shape, but the one in the middle is larger than the two on either side. Also, notice that one of the figures is shaded and that this shading alternates first right and then left. To continue this pattern in the third segment, you will look for a square. Choice b is correct because this choice will put the large square between the two smaller squares, with the shading on the right.



(A) 1

(B) 2

(C) 3

(D) 4

Answer: Option **(A)**

Explanation:

Look at each segment. You will notice that in each, the figure on the right and the figure on the left are the same; the figure in between is different. To continue this pattern in the last segment, the diamond on the left will be repeated on the right. Choice a is the only possible answer.

4. | ⌠ ⌡ | ⌁ ⌂ ⌃ | ⌄ ?



Ⓐ 1

Ⓑ 2

Ⓒ 3

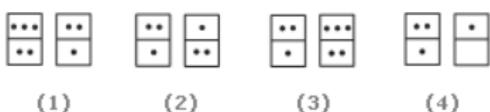
Ⓓ 4

Answer: Option Ⓑ

Explanation:

This sequence concerns the number of sides on each figure. In the first segment, the three figures have one side, and then two sides, and then three sides. In the second segment, the number of sides increases and then decreases. In the third segment, the number of sides continues to decrease.

5.



Ⓐ 1

Ⓑ 2

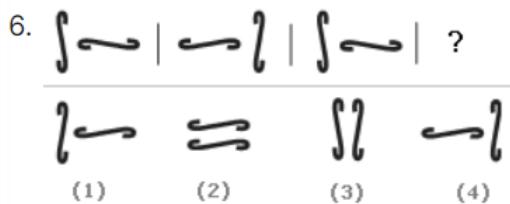
Ⓒ 3

Ⓓ 4

Answer: Option Ⓐ

Explanation:

Look carefully at the number of dots in each domino. The first segment goes from five to three to one. The second segment goes from one to three to five. The third segment repeats the first segment.



(A) 1

(B) 2

(C) 3

(D) 4

Answer: Option (D)

Explanation:

Look for opposites in this series of figures. The first and second segments are opposites of each other. The same is true for the third and fourth segments.



(A) 1

(B) 2

(C) 3

(D) 4

Answer: Option (C)

Explanation:

All four segments use the same figures: two squares, one circle, and one triangle. In the first segment, the squares are on the outside of the circle and triangle. In the second segment, the squares are below the other two. In the third segment, the squares are on the inside. In the fourth segment, the squares are above the triangle and circle.

8.  ?

-
- (1)  (2)  (3)  (4) 

A 1

B 2

C 3

D 4

Answer: Option **C**

Explanation:

In this series, the shaded part inside the circle gets larger and then smaller.

9.  ?

-
-       ?

- (1)  (2)  (3)  (4) 

A 1

B 2

C 3

D 4

Answer: Option **B**

Explanation:

Look at each segment. In the first segment, the arrows are both pointing to the right. In the second segment, the first arrow is up and the second is down. The third segment repeats the first segment. In the fourth segment, the arrows are up and then down. Because this is an alternating series, the two arrows pointing right will be repeated, so option B is the only possible choice.

10. 

-
- (1)  (2)  (3)  (4) 

A 1

B 2

C 3

D 4

Answer: Option **D**

Explanation:

This is an alternating series. The first and third segments are repeated. The second segment is simply upside down.

Class 3: Verbal Classification in Logical Reasoning

Verbal classification, also known as semantic classification, is a critical component of logical reasoning tests. It assesses an individual's ability to discern relationships between words based on their meanings, uses, or general characteristics. This type of question presents a group of words, usually four, out of which three are related to each other in some way, while one is not. The challenge lies in identifying the outlier—the word that does not belong to the same classification as the others. Verbal classification tests one's vocabulary, understanding of word relationships, and ability to apply logical deduction.

a) Understanding Verbal Classification

The essence of verbal classification is to recognize the intrinsic connection between words. This connection could be based on a variety of factors, including but not limited to:

- ✓ **Semantic Relationship:** Words may be related by their meaning, such as synonyms or antonyms.
- ✓ **Functional Relationship:** Words may be related by their use or function.
- ✓ **Part to Whole Relationship:** Words may have a relationship where one is a part of the other.
- ✓ **Type or Category:** Words may belong to the same category or type, such as animals, tools, or emotions.

The outlier might not fit due to a difference in category, function, or some other distinguishing characteristic.

b) Key Concepts in Verbal Classification

To excel in verbal classification, it is important to understand several key concepts:

- ✓ **Categories and Types:** Recognize broad categories and types into which objects, ideas, or words can be grouped.
- ✓ **Relationships Among Words:** Understand different types of relationships, such as cause and effect, part to whole, or opposites.
- ✓ **Contextual Usage:** Consider how words are used in different contexts, which can affect their classification.
- ✓ **Abstract vs. Concrete:** Distinguish between abstract concepts and concrete objects, as this can often be a basis for classification.

c) Strategies for Solving Verbal Classification Questions

- ✓ **Identify the Commonality:** First, look for a common thread that links three of the words. This could be based on their meaning, function, or any other relation.

- ✓ **Look for the Odd One Out:** Once you identify the commonality, the word that does not share this characteristic will usually stand out.
- ✓ **Consider All Possible Relationships:** If the classification is not immediately apparent, consider less obvious relationships, including functional, categorical, or conceptual connections.
- ✓ **Use Process of Elimination:** If you're unsure, eliminate choices that clearly share some commonality, narrowing down the options.
- ✓ **Expand Your Vocabulary:** A broad vocabulary and understanding of word meanings and uses are crucial for success in verbal classification. Regular reading and vocabulary exercises can enhance these skills.

d) Conclusion

Verbal classification questions test an essential skill in logical reasoning: the ability to group words based on shared characteristics and to identify outliers. Success in these questions requires a good vocabulary, keen insight into word relationships, and the application of logical thinking. By understanding the underlying concepts and applying strategic approaches to identify patterns and relationships among words, individuals can significantly improve their performance in verbal classification, thereby enhancing their overall logical reasoning abilities.

► Directions to Solve

Three of the words will be in the same classification, the remaining one will not be. Your answer will be the one word that does NOT belong in the same classification as the others.

1. Which word does NOT belong with the others?

- (A) parsley
- (B) basil
- (C) dill
- (D) mayonnaise

Answer: Option (D)

Explanation:

Parsley, basil, and dill are types of herbs. Mayonnaise is not an herb.

2. Which word does NOT belong with the others?

- (A) inch
- (B) ounce
- (C) centimeter
- (D) yard

Answer: Option (B)

Explanation:

An ounce measures weight; the other choices measure length.

3. Which word does NOT belong with the others?

- (A) tyre
- (B) steering wheel
- (C) engine
- (D) car

Answer: Option (D)

Explanation:

Tyre, steering wheel, and engine are all parts of a car.

4. Which word does NOT belong with the others?

- (A) tulip
- (B) rose
- (C) bud
- (D) daisy

Answer: Option (C)

Explanation:

Tulip, rose, and daisy are all types of flowers. A bud is not.

5. Which word does NOT belong with the others?

- (A) rye
- (B) sourdough
- (C) pumpernickel
- (D) loaf

Answer: Option (A)

Explanation:

Loaf, sourdough, and pumpernickel are types of bread. A rye is not a bread type.

Loaf - Bread that is shaped and baked in one piece and usually sliced before being eaten.

Pumpernickel - Dark, dense German bread made from coarsely ground whole-grain rye.

Sourdough - Leaven for making bread, consisting of fermenting dough, typically that left over from a previous batch.

Rye - A wheatlike cereal plant that tolerates poor soils and low temperatures.

6. Which word does NOT belong with the others?

- (A) guitar
- (B) flute
- (C) violin
- (D) cello

Answer: Option (B)

Explanation:

The guitar, violin, and cello are stringed instruments; the flute is a wind instrument.

7. Which word does NOT belong with the others?

- (A) dodge
- (B) flee
- (C) duck
- (D) avoid

Answer: Option (B)

Explanation:

Dodge, duck, and avoid are all synonyms meaning evade. Flee means to run away from.

8. Which word does NOT belong with the others?

- (A) branch
- (B) dirt
- (C) leaf
- (D) root

Answer: Option (B)

Explanation:

A branch, leaf, and root are all parts of a tree. The dirt underneath is not a part of the tree.

9. Which word does NOT belong with the others?

- (A) street
- (B) freeway
- (C) interstate
- (D) expressway

Answer: Option (A)

Explanation:

Freeway, interstate, and expressway are all high- speed highways; a street is for low-speed traffic.

10. Which word does NOT belong with the others?

- (A) heading
- (B) body
- (C) letter
- (D) closing

Answer: Option (C)

Explanation:

Heading, body, and closing are all parts of a letter; the letter is the whole, not a part.

Type-3

Directions to Solve

Remember, you are looking for the word that does NOT belong in the same group as the others. Sometimes, all four words seem to fit in the same group. If so, look more closely to further narrow your classification.

1. Which word does NOT belong with the others?

- (A) wing
- (B) fin
- (C) beak
- (D) rudder

Answer: Option (C)

Explanation:

The wing, fin, and rudder are all parts of an airplane.

2. Which word does NOT belong with the others?

- (A) core
- (B) seeds
- (C) pulp
- (D) slice

Answer: Option (D)

Explanation:

The core, seeds, and pulp are all parts of an apple. A slice would be a piece taken out of an apple.

3. Which word does NOT belong with the others?

- (A) peninsula
- (B) island
- (C) bay
- (D) cape

Answer: Option (C)

Explanation:

A peninsula, island, and cape are all landforms; a bay is a body of water.

4. Which word does NOT belong with the others?

- (A) fair
- (B) just
- (C) equitable
- (D) favorable

Answer: Option (D)

Explanation:

Fair, just, and equitable are all synonyms meaning impartial. Favorable means expressing approval.

5. Which word does NOT belong with the others?

- (A) unique
- (B) beautiful
- (C) rare
- (D) exceptional

Answer: Option (B)

Explanation:

Unique, rare, and exceptional are all synonyms. Beautiful has a different meaning.

6. Which word does NOT belong with the others?

- (A) acute
- (B) right
- (C) obtuse
- (D) parallel

Answer: Option (D)

Explanation:

Acute, right, and obtuse are geometric terms describing particular angles. Parallel refers to two lines that never intersect.

7. Which word does NOT belong with the others?

- (A) triangle
- (B) circle
- (C) oval
- (D) sphere

Answer: Option (A)

Explanation:

A circle, oval, and sphere are all circular shapes with no angles. A triangle is a different kind of shape with angles and three straight sides.

8. Which word does NOT belong with the others?

- (A) scythe
- (B) knife
- (C) pliers
- (D) saw

Answer: Option (C)

Explanation:

The scythe, knife, and saw are all cutting tools. Pliers are tools, but they are not used for cutting.

9. Which word does NOT belong with the others?

- (A) biology
- (B) chemistry
- (C) theology
- (D) zoology

Answer: Option (C)

Explanation:

Biology, chemistry, and zoology are all branches of science. Theology is the study of religion.

10. Which word does NOT belong with the others?

- (A) evaluate
- (B) assess
- (C) appraise
- (D) instruct

Answer: Option (D)

Explanation:

Evaluate, assess, and appraise are all synonyms; instruct does not mean the same thing.

Class 4: Analogies in Logical Reasoning

Analogies are fundamental components of logical reasoning tests, serving to assess an individual's ability to see relationships between pairs of words, objects, or ideas. By understanding and applying analogical reasoning, one can deduce how different elements relate to each other in a specific way, then apply this understanding to find parallel relationships among other elements. This type of question challenges test-takers to draw connections based on similarity, function, part to whole relationships, cause and effect, and more, thereby testing their cognitive abilities, creativity, and depth of understanding.

a) Understanding Analogies

An analogy is essentially a comparison that points out relationships between two things: it shows how one thing is related to another based on similarity or another relation. In logical reasoning tests, analogies are presented in a variety of formats, but most commonly as pairs of words. The goal is to identify how these pairs relate to each other and then find another pair that shares the same relationship.

b) Key Concepts in Analogies

To master analogies, it's crucial to grasp several key concepts:

- ✓ **Similarity:** Recognizing how two things are alike.
- ✓ **Contrast:** Understanding how two things are different, often presented as antonyms.
- ✓ **Function:** Identifying how the function or purpose of one thing relates to another.
- ✓ **Degree:** Seeing the relationship in terms of intensity or extent.
- ✓ **Sequence:** Recognizing a progression or a series.
- ✓ **Part to Whole:** Understanding how a part is related to its whole.
- ✓ **Cause and Effect:** Identifying a causal relationship between two elements.

c) Strategies for Solving Analogies

- ✓ **Describe the Relationship:** Formulate a sentence that describes the relationship between the first pair of words or elements. This helps clarify the nature of their connection.
- ✓ **Apply the Relationship:** Use the sentence or concept derived from the first pair to determine which among the options shares the same relationship with the third element.
- ✓ **Look Beyond the Obvious:** Some relationships might be abstract or not immediately apparent. Think creatively and consider various dimensions of relationships.

- ✓ **Eliminate Outliers:** Narrow down the choices by eliminating options that clearly do not fit the identified relationship.
- ✓ **Practice with Diversity:** Expose yourself to a wide range of analogy questions to become familiar with different types of relationships and to improve your ability to quickly identify them.

d) Conclusion

Analogies play a crucial role in evaluating and enhancing logical reasoning skills. They not only test an individual's vocabulary and knowledge but also their ability to make connections and deduce relationships between seemingly disparate elements. Excelling in analogy questions requires a well-rounded understanding of language, a keen sense of observation, and the ability to think critically and creatively. Through regular practice and strategic thinking, one can significantly improve their proficiency in solving analogies, thereby boosting their overall performance in logical reasoning assessments.

Type-1

► Directions to Solve

A good way to figure out the relationship in a given question is to make up a sentence that describes the relationship between the first two words. Then, try to use the same sentence to find out which of the answer choices completes the same relationship with the third word.

1. Odometer is to mileage as compass is to

- (A) speed
- (B) hiking
- (C) needle
- (D) direction

Answer: Option (D)

Explanation:

An odometer is an instrument used to measure mileage. A compass is an instrument used to determine direction. Choices a, b, and c are incorrect because none is an instrument.

2. Marathon is to race as hibernation is to

- (A) winter
- (B) bear
- (C) dream
- (D) sleep

Answer: Option (D)

Explanation:

A marathon is a long race and hibernation is a lengthy period of sleep. The answer is not choice a or b because even though a bear and winter are related to hibernation, neither completes the analogy. (Choice c) is incorrect because sleep and dream are not synonymous.

3. Window is to pane as book is to

- (A) novel
- (B) glass
- (C) cover
- (D) page

Answer: Option (D)

Explanation:

A window is made up of panes, and a book is made up of pages. The answer is not (choice a) because a novel is a type of book. The answer is not (choice b) because glass has no relationship to a book. (Choice c) is incorrect because a cover is only one part of a book; a book is not made up of covers.

4. Cup is to coffee as bowl is to

- (A) dish
- (B) soup
- (C) spoon
- (D) food

Answer: Option (B)

Explanation:

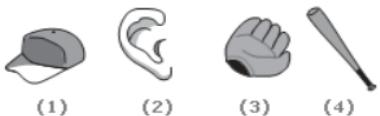
Coffee goes into a cup and soup goes into a bowl. Choices a and c are incorrect because they are other utensils. The answer is not choice d because the word food is too general.

Type-2

► Directions to Solve

Choose the picture that would go in the empty box so that the two bottom pictures are related in the same way as the top two are related.

1.



(A) 1

(B) 2

(C) 3

(D) 4

Answer: Option (A)

Explanation:

Hand is to ring as head is to cap. A ring is worn on a person's hand; a cap is worn on a person's head.

2.



(A) 1

(B) 2

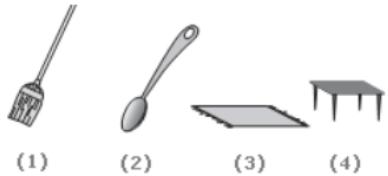
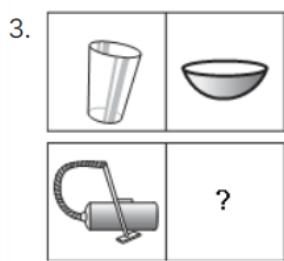
(C) 3

(D) 4

Answer: Option (D)

Explanation:

Car is to horse and buggy as computer is to pen and ink. This relationship shows the difference between modern times and times past.



1

2

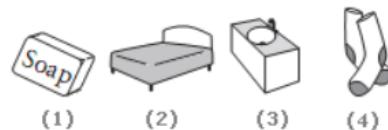
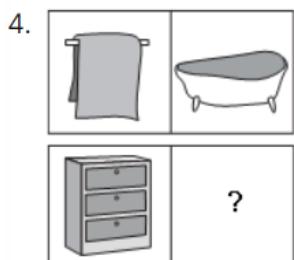
3

4

Answer: Option

Explanation:

Cup is to bowl as vacuum cleaner is to broom. This is another relationship about function. The cup and bowl are both used for eating. The vacuum cleaner and broom are both used for cleaning.



1

2

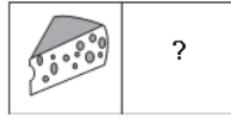
3

4

Answer: Option

Explanation:

Towel is to bathtub as chest of drawers is to bed. The towel and bathtub are both found in a bathroom; the chest and the bed are both found in a bedroom.



A 1

B 2

C 3

D 4

Answer: Option A

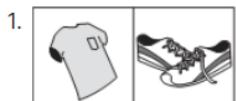
Explanation:

Grapes are to a pear as cheese is to butter. This relationship shows the grouping or category to which something belongs. Grapes and pears are fruit; cheese and butter are both dairy products.

Type-3

Directions to Solve

Choose the picture that would go in the empty box so that the two bottom pictures are related in the same way as the top two are related.



A 1

B 2

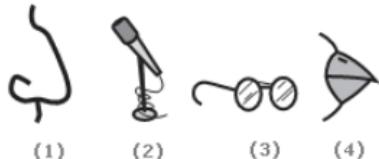
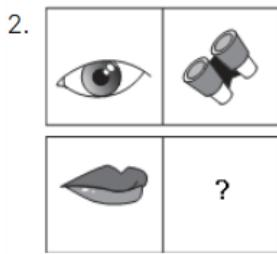
C 3

D 4

Answer: Option B

Explanation:

A T-shirt is to a pair of shoes as a chest of drawers is to a couch. The relationship shows to which group something belongs. The T-shirt and shoes are both articles of clothing; the chest and couch are both pieces of furniture.



A 1

B 2

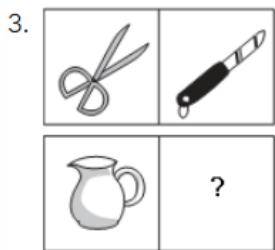
C 3

D 4

Answer: Option B

Explanation:

An eye is to a pair of binoculars as a mouth is to a microphone. This relationship shows magnification. The binoculars help one see farther. The microphone helps one speak louder.



A 1

B 2

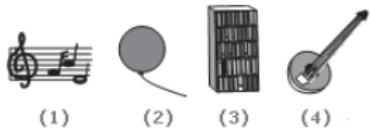
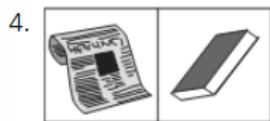
C 3

D 4

Answer: Option C

Explanation:

Scissors is to knife as pitcher is to watering can. This relationship is about function. The scissors and knife are both used for cutting. The pitcher and watering can are both used for watering.



A 1

B 2

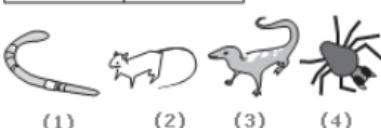
C 3

D 4

Answer: Option D

Explanation:

Newspaper is to book as trumpet is to banjo. The newspaper and book are to read; the trumpet and banjo are musical instruments to play.



A 1

B 2

C 3

D 4

Answer: Option C

Explanation:

Fly is to ant as snake is to lizard. The fly and ant are both insects; the snake and lizard are both reptiles.

Type-4

► Directions to Solve

The words in the bottom row are related in the same way as the words in the top row. For each item, find the word that completes the bottom row of words.

1. candlelamp floodlight

hut cottage ?

(A) tent

(B) city

(C) dwelling

(D) house

Answer: Option (D)

Explanation:

Above the line, the relationship shows a progression of sources of light. The relationship below the line shows a progression of types of housing, from smallest to largest. (Choice a) is incorrect because a tent is smaller than a house. Choices b and c are wrong because they are not part of the progression.

2. daisy flowerplant

bungalowhouse ?

(A) building

(B) cottage

(C) apartment

(D) city

Answer: Option (A)

Explanation:

Above the line, the relationship is as follows: A daisy is a type of flower, and a flower is a type of plant. Below the line, the relationship is as follows: A bungalow is a type of house, and a house is a type of building.

3. palette easel brush

textbooklesson plan ?

- (A) artist
- (B) teacher
- (C) report card
- (D) paint

Answer: Option (C)

Explanation:

The objects above the line are all things used by an artist. The objects below the line are all things used by a teacher.

4. rule commanddictate

dozesleep ?

- (A) snore
- (B) govern
- (C) awaken
- (D) hibernate

Answer: Option (D)

Explanation:

The words above the line show a continuum: Command is more extreme than rule, and dictate is more extreme than command. Below the line, the continuum is as follows: Sleep is more than doze, and hibernate is more than sleep. The other choices are not related in the same way.

5. applesfruit supermarket

novel book ?

- (A) bookstore
- (B) magazine
- (C) vegetable
- (D) shopping

Answer: Option (A)

Explanation:

The relationship above the line is as follows; apples are a kind of fruit; fruit is sold in a supermarket. Below the line, the relationship is: a novel is a kind of book; books are sold in a bookstore.

Type-5

Directions to Solve

Every one of the following questions consists of a related pair of words, followed by five pairs of words. Choose the pair that best represents a similar relationship to the one expressed in the original pair of words.

1. BINDING : BOOK

- (A) criminal : gang
- (B) display : museum
- (C) artist : carpenter
- (D) nail : hammer
- (E) frame : picture

Answer: Option (E)

Explanation:

A binding surrounds a book; a frame surrounds a picture.

2. EXPLORE : DISCOVER

- (A) read : skim
- (B) research : learn
- (C) write : print
- (D) think : relate
- (E) sleep : wake

Answer: Option (B)

Explanation:

One explores to discover; one researches to learn.

3. SIAMESE : CAT

- (A) type : breed
- (B) dog : puppy
- (C) mark : spot
- (D) romaine : lettuce
- (E) collar : leash

Answer: Option (D)

Explanation:

Siamese is a kind of cat; romaine is a kind of lettuce.

4. FINCH : BIRD

- (A) frog : toad
- (B) elephant : reptile
- (C) Dalmatian : dog
- (D) collie : marsupial
- (E) ant : ladybug

Answer: Option (C)

Explanation:

A finch is a type of bird; a Dalmatian is a type of dog.

5. PETAL : FLOWER

- (A) salt : pepper
- (B) tire : bicycle
- (C) base : ball
- (D) sandals : shoes
- (E) puppy : dog

Answer: Option (B)

Explanation:

A petal is a part of a flower; a tire is a part of a bicycle.

Type-6

► Directions to Solve

Choose the pair that best represents a similar relationship to the one expressed in the original pair of words.

1. MONK : DEVOTION

- (A) maniac : pacifism
- (B) explorer : contentment
- (C) visionary : complacency
- (D) rover : wanderlust
- (E) philistine : culture

Answer: Option (D)

Explanation:

Devotion is characteristic of a monk; wanderlust is characteristic of a rover.

2. SLAPSTICK : LAUGHTER

- (A) fallacy : dismay
- (B) genre : mystery
- (C) satire : anger
- (D) mimicry : tears
- (E) horror : fear

Answer: Option (E)

Explanation:

Slapstick results in laughter; horror results in fear.

3. VERVE : ENTHUSIASM

- (A) loyalty : duplicity
- (B) devotion : reverence
- (C) intensity : color
- (D) eminence : anonymity
- (E) generosity : elation

Answer: Option (B)

Explanation:

Verve and enthusiasm are synonyms; devotion and reverence are synonyms.

4. SPY : CLANDESTINE

- (A) accountant : meticulous
- (B) furrier : rambunctious
- (C) lawyer : ironic
- (D) shepherd : garrulous
- (E) astronaut : opulent

Answer: Option (A)

Explanation:

A spy acts in a clandestine manner; an accountant acts in a meticulous manner.

5. COBBLER : SHOE

- (A) jockey : horse
- (B) contractor : building
- (C) mason : stone
- (D) cowboy : boot
- (E) potter : paint

Answer: Option (B)

Explanation:

A cobbler makes and repairs shoes; a contractor builds and repairs buildings.

Class 5: Artificial Language

The topic of Artificial Language in Logical Reasoning refers to a type of puzzle or problem where individuals are asked to deduce the rules of a fictional or constructed language based on a limited set of examples. These problems often involve translating words from the artificial language to English (or another known language) and vice versa. The primary challenge lies in identifying the pattern or system that governs how words are formed in the artificial language, such as how nouns, verbs, or other parts of speech are modified, conjugated, or constructed.

To solve these puzzles, one typically follows a systematic approach:

- ✓ **Identification of Patterns:** Look for recurring elements or affixes in the given words and their translations. This may involve prefixes, suffixes, or changes in the root word that correspond to particular grammatical categories (like tense, number, or gender) or semantic categories (such as objects, actions, or descriptions).
- ✓ **Segmentation and Classification:** Break down the words into their constituent parts and classify these parts based on their functions. For example, if "gato" means "cat" and "gatos" means "cats" in the artificial language, one might infer that adding "s" signifies plural nouns.
- ✓ **Application of Rules:** Once patterns and rules are identified, apply them to translate new words from the artificial language to English or to create artificial language equivalents of English words. This step often involves reversing the process used in the initial analysis, constructing or deconstructing words according to the inferred grammatical rules.
- ✓ **Testing and Refinement:** Use additional examples to test the hypothesized rules. If a rule does not apply universally or there are exceptions, the theory may need to be refined. This iterative process helps in refining the understanding of the artificial language's grammar and vocabulary.

The study of artificial languages in logical reasoning exercises enhances critical thinking, pattern recognition, and problem-solving skills. It requires a meticulous and analytical approach to decipher the underlying logic of how words and sentences are constructed, mirroring the process of learning a new natural language but within a more controlled and simplified framework.

Directions to Solve

First, you will be given a list of three "nonsense" words and their English word meanings. The question(s) that follow will ask you to reverse the process and translate an English word into the artificial language.

1. Here are some words translated from an artificial language.

gorblflur means fan belt

pixngorbl means ceiling fan

arthtusl means tile roof

Which word could mean "ceiling tile"?

- (A) gorbltusl
- (B) flurgorbl
- (C) arthflur
- (D) pixnarth

Answer: Option (D)

Explanation:

Gorbl means fan; *flur* means belt; *pixn* means ceiling; *arth* means tile; and *tusl* means roof. Therefore, *pixnarth* is the correct choice.

2. Here are some words translated from an artificial language.

hapllesh means cloudburst

srenchoch means pinball

resbosrench means ninepin

Which word could mean "cloud nine"?

- (A) leshsrench
- (B) ochhapl
- (C) haploch
- (D) haplresbo

Answer: Option (D)

Explanation:

Hapl means cloud; *lesh* means burst; *srench* means pin; *och* means ball; and *resbo* means nine. *Leshsrench* (choice a) doesn't contain any of the words needed for cloud nine. We know that *och* means ball, so that rules out choices b and c. When you combine *hapl* (cloud) with *resbo* (nine), you get the correct answer.

3. Here are some words translated from an artificial language.

agnoscrenia means poisonous spider

delanocrenia means poisonous snake

agnosdeery means brown spider

Which word could mean "black widow spider"?

(A) deeryclostagnos

(B) agnosdelano

(C) agnosvitriblunin

(D) trymuttiagnos

Answer: Option (C)

Explanation:

In this language, the noun appears first and the adjectives follow. Since *agnos* means spider and should appear first, choices a and d can be ruled out. Choice b can be ruled out because *delano* means snake.

4. Here are some words translated from an artificial language.

moolokarn means blue sky

wilkospadi means bicycle race

moowlilko means blue bicycle

Which word could mean "racecar"?

(A) wilkozwet

(B) spadiwilko

(C) moolobreil

(D) spadivolo

Answer: Option (D)

Explanation:

From *wilkospadi*, you can determine that *wilko* means bicicyle and *spadi* means race. Therefore, the first part of the word that means racecar should begin with *spadi*. That limits your choices to b and d. Choice b, *spadiwilko*, is incorrect because we have already determined that *wilko* means bicycle. Therefore, the answer must be choice d, *spadivolo*.

5. Here are some words translated from an artificial language.

migenlasan means cupboard

lasanpoen means boardwalk

cuopdansa means pullman

Which word could mean "walkway"?

(A) poenmigen

(B) cuopeisel

(C) lasandansa

(D) poenforc

Answer: Option (D)

Explanation:

Migen means cup; *lasan* means board; *poen* means walk; *cuop* means pull; and *dansa* means man. The only possible choices, then, are choices a and d. Choice a can be ruled out because *migen* means cup.

6. Here are some words translated from an artificial language.

godabim means kidney stones

romzbim means kidney beans

romzbako means wax beans

Which word could mean "wax statue"?

(A) godaromz

(B) lazvim

(C) wasibako

(D) romzpeo

Answer: Option (C)

Explanation:

In this language, the adjective follows the noun. From *godabim* and *romzbim*, you can determine that *bim* means kidney. From *romzbim* and *romzbako*, you can determine that *romz* means beans. Therefore, *bako* means wax. Because the adjective wax must come after the noun in this language, *wasibako* is the only choice.

7. Here are some words translated from an artificial language.

granamelke means big tree

pinimelke means little tree

melkehoon means tree house

Which word could mean "big house"?

(A) granahoon

(B) pinishur

(C) pinihoon

(D) melkegrana

Answer: Option (A)

Explanation:

Grana means big; melke means tree; pini means little; hoon means house. Therefore, granahoon means big house.

Type - 2

► Directions to Solve

Translate from an imaginary language into English. Then, look for the word elements that appear both on the list and in the answer choices.

1. Here are some words translated from an artificial language.

gemolinea means fair warning

gerimitu means report card

gilageri means weather report

Which word could mean "fair weather"?

(A) gemogila

(B) gerigeme

(C) gemomitu

(D) gerimita

Answer: Option (A)

Explanation:

Gemo means fair; linea means warning; geri means report; mitu means card; and gilameans weather. Thus, gemogila is the correct choice.

2. Here are some words translated from an artificial language.

slar means jump

slary means jumping

slarend means jumped

Which word could mean "playing"?

(A) clargslarend

(B) clargy

(C) ellaclarg

(D) slarmont

Answer: Option (B)

Explanation:

According to this language, *slar* means jump. The suffix -ing is represented by -y. Since choice b is the only one that ends in the letter y, this is the only possible option.

3. Here are some words translated from an artificial language.

jalkamofti means happy birthday

moftihoze means birthday party

mentogunn means goodness

Which word could mean "happiness"?

(A) jalkagunn

(B) mentohoze

(C) moftihoze

(D) hozemento

Answer: Option (A)

Explanation:

Jalka means happy; mofti means birthday; hoze means party; mento means good; and gunn means the suffix "ness". We know the answer must include the suffix "ness". The only choice that uses that suffix is choice a.

4. Here are some words translated from an artificial language.

plekapaki means fruitcake

pakishillen means cakewalk

treftalan means buttercup

Which word could mean "cupcake"?

(A) shillenalan

(B) treftpleka

(C) pakitreft

(D) alanpaki

Answer: Option (D)

Explanation:

Pleka means fruit; paki means cake; shillen means walk; treftmeans butter; and alanmeans cup. Therefore, alanpaki means cupcake.

5. Here are some words translated from an artificial language.

malgauper means peach cobbler

malgaport means peach juice

moggagrop means apple jelly

Which word could mean "apple juice"?

(A) moggaport

(B) malgauper

(C) gropport

(D) moggagrop

Answer: Option (A)

Explanation:

Malga means peach; uper means cobbler; port means juice; mogga means apple; and grop means jelly. Therefore, moggaport means apple juice.

6. Here are some words translated from an artificial language.

peslligen means basketball court

ligenstrisi means courtroom

oltaganti means placement test

Which word could mean "guest room"?

(A) peslstrisi

(B) vosefstrisi

(C) gantipesl

(D) oltastrisi

Answer: Option (B)

Explanation:

Pesl means basketball; ligen means court; strisi means room; olta means placement; and ganti means test.

Because strisi means room, it must be present in the answer, so that rules out choice c. Choices a and d are incorrect because pesl means basketball and olta means placement. That leaves choice b as the only possible answer.

7. Here are some words translated from an artificial language.

mallonpiml means blue light

mallontifl means blueberry

arpantifl means raspberry

Which word could mean "lighthouse"?

(A) tiflmallon

(B) pimlarpan

(C) mallonarpan

(D) pimldoken

Answer: Option (D)

Explanation:

Mallon means blue; piml means light; tifl means berry; and arpan means "rasp" in raspberry. The word piml, which means light, is required for the word lighthouse. That rules out choices a and c. Arpan in choice b means "rasp", so that rules out choice b. That leaves choice d the only possible answer.

Class 6: Logical Reasoning Problem

The theory behind logical reasoning problems, particularly those structured around a set of statements with the task of deducing further truths, revolves around the application of logical deduction and inference. In the context of the described scenario, where participants are given a series of facts and must determine the veracity of subsequent statements based on those facts, the primary goal is to employ critical thinking to analyze and synthesize information to arrive at a conclusion. This involves a keen understanding of relationships, sequencing, and causality within the given statements.

a) Theory

Logical reasoning problems are designed to assess an individual's ability to logically connect pieces of information, deduce new information from given facts, and apply logical principles to solve problems. The theory encompasses several key skills:

- ✓ **Deductive Reasoning:** The process of reasoning from one or more statements (premises) to reach a logically certain conclusion. It involves applying general rules to specific instances to see if the rules hold in the particular case.
- ✓ **Inductive Reasoning:** This involves making broad generalizations from specific observations. It's more about making probable conclusions based on the information available.
- ✓ **Analytical Thinking:** The ability to deconstruct information into smaller categories and examine the underlying structure to understand the relationship between various components.
- ✓ **Pattern Recognition:** Identifying patterns and trends in a set of data, which is crucial for predicting and making informed decisions based on the patterns.

b) Types of Logical Problems

Logical reasoning problems can come in various formats, each designed to test different aspects of logical and analytical thinking:

- ✓ **Sequencing and Ordering:** Problems where you must arrange items or events in a logical order based on given conditions. The football player scenario is an example, requiring you to understand spatial and sequential relationships.
- ✓ **Classification:** Involves grouping items based on shared characteristics, often requiring the solver to identify patterns or rules that apply to the groups.
- ✓ **Logical Deductions:** Problems that require you to deduce new information from given facts. This includes syllogisms where conclusions are drawn from two or more given premises.
- ✓ **Cause and Effect:** These problems require you to identify relationships between events, specifically how one event leads to another. Understanding causality is crucial.

Analogy and Similarities: Involving the identification of relationships between pairs of concepts, words, or objects, and then applying this relationship to solve problems or complete patterns.

Puzzle Problems: These are more complex problems that integrate multiple types of logical reasoning to solve a puzzle or find a solution to a complex scenario.

c) Application to the Given Scenario

In the football player scenario, the problem is primarily one of sequencing and understanding spatial relationships, along with some elements of cause and effect (e.g., one player tripping and its implications on the sequence of events). The solver must logically deduce which player is in a position to tackle the receiver based on the described sequence of events and the spatial arrangement of the players. This involves analyzing the given facts, applying deductive reasoning to understand the implications of these facts, and then making a logical conclusion about which statement(s) can be considered true based on the information provided.

👉 Directions to Solve

Each problem consists of three statements. Based on the first two statements, the third statement may be true, false, or uncertain.

1. Tanya is older than Eric.

Cliff is older than Tanya.

Eric is older than Cliff.

If the first two statements are true, the third statement is

- (A) true
- (B) false
- (C) uncertain

Answer: Option (B)

Explanation:

Because the first two statements are true, Eric is the youngest of the three, so the third statement must be false.

2. Blueberries cost more than strawberries.

Blueberries cost less than raspberries.

Raspberries cost more than strawberries and blueberries.

If the first two statements are true, the third statement is

- (A) true
- (B) false
- (C) uncertain

Answer: Option (A)

Explanation:

Because the first two statements are true, raspberries are the most expensive of the three.

3. All the trees in the park are flowering trees.

Some of the trees in the park are dogwoods.

All dogwoods in the park are flowering trees.

If the first two statements are true, the third statement is

- (A) true
- (B) false
- (C) uncertain

Answer: Option (A)

Explanation:

All of the trees in the park are flowering trees, So all dogwoods in the park are flowering trees.

4. Mara runs faster than Gail.

Lily runs faster than Mara.

Gail runs faster than Lily.

If the first two statements are true, the third statement is

- (A) true
- (B) false
- (C) uncertain

Answer: Option (B)

Explanation:

We know from the first two statements that Lily runs fastest. Therefore, the third statement must be false.

5. Apartments in the Riverdale Manor cost less than apartments in The Gaslight Commons.

Apartments in the Livingston Gate cost more than apartments in The Gaslight Commons.

Of the three apartment buildings, the Livingston Gate costs the most.

If the first two statements are true, the third statement is

- (A) true
- (B) false
- (C) uncertain

Answer: Option (A)

Explanation:

Since the Gaslight Commons costs more than the Riverdale Manor and the Livingston Gate costs more than the Gaslight Commons, it is true that the Livingston Gate costs the most.

Type-2

► Directions to Solve

Each problem consists of three statements. Based on the first two statements, the third statement may be true, false, or uncertain.

1. A fruit basket contains more apples than lemons.

There are more lemons in the basket than there are oranges.

The basket contains more apples than oranges.

If the first two statements are true, the third statement is

(A) true

(B) false

(C) uncertain

Answer: Option (A)

Explanation:

There are fewer oranges than either apples or lemons, so the statement is true.

Easy method: (Try this method to solve without any confusion)

1. A fruit basket contains more apples than lemons = App > Lem

2. There are more lemons in the basket than there are oranges = Lem > Org

Now, Combine the above two results: App > Lem > Org

3. The basket contains more apples than oranges (App > ... > Org) = Yes.

Therefore, the given 3rd statement is true.

2. The Shop and Save Grocery is south of Greenwood Pharmacy.

Rebecca's house is northeast of Greenwood Pharmacy.

Rebecca's house is west of the Shop and Save Grocery.

If the first two statements are true, the third statement is

(A) true

(B) false

(C) uncertain

Answer: Option (B)

Explanation:

Because the first two statements are true, Rebecca's house is also northeast of the Shop and Save Grocery, which means that the third statement is false.

3. Joe is younger than Kathy.

Mark was born after Joe.

Kathy is older than Mark.

If the first two statements are true, the third statement is

(A) true

(B) false

(C) uncertain

Answer: Option (A)

Explanation:

Joe is younger than Kathy and older than Mark, so Mark must be younger than Kathy.

4. On the day the Barton triplets are born,

Jenna weighs more than Jason.

Jason weighs less than Jasmine.

Of the three babies, Jasmine weighs the most.

If the first two statements are true, the third statement is

(A) true

(B) false

(C) uncertain

Answer: Option (C)

Explanation:

We only know that Jasmine weighs more than Jason. There is no way to tell whether Jasmine also weighs more than Jenna.

5. The temperature on Monday was lower than on Tuesday.

The temperature on Wednesday was lower than on Tuesday.

The temperature on Monday was higher than on Wednesday

If the first two statements are true, the third statement is

(A) true

(B) false

(C) uncertain

Answer: Option (C)

Explanation:

We know from the first two statements that Tuesday had the highest temperature, but we cannot know whether Monday's temperature was higher than Wednesday's

Type-3

► Directions to Solve

Each problem consists of three statements. Based on the first two statements, the third statement may be true, false, or uncertain.

1. All Lamels are Signots with buttons.

No yellow Signots have buttons.

No Lamels are yellow.

If the first two statements are true, the third statement is

- (A) true
- (B) false
- (C) uncertain

Answer: Option (A)

Explanation:

We know that there are Signots with buttons, or Lamels, and that there are yellow Signots, which have no buttons. Therefore, Lamels do not have buttons and cannot be yellow.

2. The hotel is two blocks east of the drugstore.

The market is one block west of the hotel.

The drugstore is west of the market.

If the first two statements are true, the third statement is

- (A) true
- (B) false
- (C) uncertain

Answer: Option (A)

Explanation:

The market is one block west of the hotel. The drugstore is two blocks west of the hotel, so the drugstore is west of the market.

3. A toothpick is useful.

Useful things are valuable.

A toothpick is valuable.

If the first two statements are true, the third statement is

- (A) true
- (B) false
- (C) uncertain

Answer: Option (A)

Explanation:

To the extent that a toothpick is useful, it has value.

4. Tom puts on his socks before he puts on his shoes.

He puts on his shirt before he puts on his jacket.

Tom puts on his shoes before he puts on his shirt.

If the first two statements are true, the third statement is

- (A) true
- (B) false
- (C) uncertain

Answer: Option (C)

Explanation:

There is not enough information to verify the third statement.

5. Three pencils cost the same as two erasers.
Four erasers cost the same as one ruler.
Pencils are more expensive than rulers.
If the first two statements are true, the third statement is

- (A) true
- (B) false
- (C) uncertain

Answer: Option (B)

Explanation:

Rulers are the most expensive item.

Type-4

 **Directions to Solve**

The logic problems in this set present you with three true statements: Fact 1, Fact 2, and Fact 3. Then, you are given three more statements (labeled I, II, and III), and you must determine which of these, if any, is also a fact. One or two of the statements could be true; all of the statements could be true; or none of the statements could be true. Choose your answer based solely on the information given in the first three facts.

1. Fact 1: All dogs like to run.
Fact 2: Some dogs like to swim.
Fact 3: Some dogs look like their masters.
If the first three statements are facts, which of the following statements must also be a fact?
I: All dogs who like to swim look like their masters.
II: Dogs who like to swim also like to run.
III: Dogs who like to run do not look like their masters.

- (A) I only
- (B) II only
- (C) II and III only
- (D) None of the statements is a known fact.

Answer: Option (B)

Explanation:

Statement II is the only true statement. Since all dogs like to run, then the ones who like to swim also like to run. There is no support for statement I or statement III.

2. Fact 1: Jessica has four children

Fact 2: Two of the children have blue eyes and two of the children have brown eyes.

Fact 3: Half of the children are girls.

If the first three statements are facts, which of the following statements must also be a fact?

I: At least one girl has blue eyes.

II: Two of the children are boys.

III: The boys have brown eyes.

(A) I only

(B) II only

(C) II and III only

(D) None of the statements is a known fact.

Answer: Option (B)

Explanation:

Since one-half of the four children are girls, two must be boys. It is not clear which children have blue or brown eyes.

4. Fact 1: All chickens are birds.

Fact 2: Some chickens are hens.

Fact 3: Female birds lay eggs.

If the first three statements are facts, which of the following statements must also be a fact?

I: All birds lay eggs.

II: Some hens are birds.

III: Some chickens are not hens.

(A) I only

(B) II only

(C) II and III only

(D) None of the statements is a known fact.

Answer: Option (C)

Explanation:

The first statement cannot be true because only female birds lay eggs. Statement II is true because some hens are chickens and all chickens are birds. Statement III is also true because if only some chickens are hens, then some must not be hens.

5. Fact 1: All hats have brims.

Fact 2: There are black hats and blue hats.

Fact 3: Baseball caps are hats.

If the first three statements are facts, which of the following statements must also be a fact?

I: All caps have brims.

II: Some baseball caps are blue.

III: Baseball caps have no brims.

(A) I only

(B) II only

(C) II and III only

(D) None of the statements is a known fact.

Answer: Option (D)

Explanation:

All baseball caps have brims, since baseball caps are hats (Fact 3) and all hats have brims (Fact 1). This rules out statement III, but it doesn't follow that all caps, a category that may include caps that are not baseball caps, have brims (statement I). Statement II cannot be confirmed, either, since it is possible, given the information, that all baseball caps are black.

6. Fact 1: Eyeglass frames cost between \$35 and \$350.

Fact 2: Some eyeglass frames are made of titanium.

Fact 3: Some eyeglass frames are made of plastic.

If the first three statements are facts, which of the following statements must also be a fact?

I: Titanium eyeglass frames cost more than plastic frames.

II: Expensive eyeglass frames last longer than cheap frames.

III: Only a few eyeglass frames cost less than \$35.

(A) I only

(B) II only

(C) II and III only

(D) None of the statements is a known fact.

Answer: Option (D)

Explanation:

There is no information in the facts to support statements I or II. Statement III is clearly wrong because, according to Fact 1, no frames cost less than \$35.

Type-5

► Directions to Solve

Read the question carefully and choose the correct answer.

1. Four defensive football players are chasing the opposing wide receiver, who has the ball. Calvin is directly behind the ball carrier. Jenkins and Burton are side by side behind Calvin. Zeller is behind Jenkins and Burton. Calvin tries for the tackle but misses and falls. Burton trips. Which defensive player tackles the receiver?

- (A) Burton
- (B) Zeller
- (C) Jenkins
- (D) Calvin

Answer: Option (C)

Explanation:

After all the switching was done, Jenkins was directly behind the receiver. Calvin and Burton had fallen. Zeller remained in the rear.

2. A four-person crew from Classic Colors is painting Mr. Field's house. Michael is painting the front of the house. Ross is in the alley behind the house painting the back. Jed is painting the window frames on the north side, Shawn is on the south. If Michael switches places with Jed, and Jed then switches places with Shawn, where is Shawn?

- (A) in the alley behind the house
- (B) on the north side of the house
- (C) in front of the house
- (D) on the south side of the house

Answer: Option (C)

Explanation:

After all the switches were made, Shawn is in front of the house. Ross is in the alley behind the house, Michael is on the north side, and Jed is on the south.

3. In a four-day period Monday through Thursday each of the following temporary office workers worked only one day, each a different day. Ms. Johnson was scheduled to work on Monday, but she traded with Mr. Carter, who was originally scheduled to work on Wednesday. Ms. Falk traded with Mr. Kirk, who was originally scheduled to work on Thursday. After all the switching was done, who worked on Tuesday?

(A) Mr. Carter

(B) Ms. Falk

(C) Ms. Johnson

(D) Mr. Kirk

Answer: Option (D)

Explanation:

After all the switches were made, Mr. Kirk worked on Tuesday. Mr. Carter worked on Monday, Ms. Johnson on Wednesday, and Ms. Falk on Thursday.

4. Four people witnessed a mugging. Each gave a different description of the mugger. Which description is probably right?

(A) He was average height, thin, and middle-aged.

(B) He was tall, thin, and middle-aged.

(C) He was tall, thin, and young.

(D) He was tall, of average weight, and middle-aged.

Answer: Option (B)

Explanation:

Tall, thin, and middle-aged are the elements of the description repeated most often and are therefore the most likely to be accurate.

5. Ms. Forest likes to let her students choose who their partners will be; however, no pair of students may work together more than seven class periods in a row. Adam and Baxter have studied together seven class periods in a row. Carter and Dennis have worked together three class periods in a row. Carter does not want to work with Adam. Who should be assigned to work with Baxter?

(A) Carter

(B) Adam

(C) Dennis

(D) Forest

Answer: Option (A)

Explanation:

Baxter should be assigned to study with Carter. Baxter cannot be assigned with Adam, because they have already been together for seven class periods. If Baxter is assigned to work with Dennis, that would leave Adam with Carter, but Carter does not want to work with Adam.

Class 7: Making Judgements

The topic of "Making Judgements" under the broad subject of Logical Reasoning involves the process of drawing conclusions or making decisions based on given information, scenarios, or statements. This process is crucial in various fields, including but not limited to, law, management, psychology, and everyday decision-making. The theory underlying this topic encompasses several key aspects and principles, which are detailed below:

a) Understanding the Information:

The first step in making judgments is to thoroughly understand the information presented. This involves identifying key facts, assumptions, and the context of the situation. It's important to distinguish between what is explicitly stated and what may be implied.

Question 1: You read a report stating, "Most of the residents in the coastal area are not prepared for a major hurricane." Which of the following conclusions is directly supported by the statement?

- A) All residents in the coastal area are at risk of a major hurricane.
- B) No resident in the coastal area has prepared for a major hurricane.
- C) Some residents in the coastal area are prepared for a major hurricane.
- D) The coastal area will definitely be hit by a major hurricane soon.

Correct Answer: C) Some residents in the coastal area are prepared for a major hurricane.

Explanation: The statement implies that while most are not prepared, there may still be some who are prepared. It does not imply certainty about a hurricane hitting or that no one is prepared.

Question 2: A statement in a newspaper reads, "A study finds that eating fruits and vegetables reduces the risk of heart disease." What does this imply?

- A) Eating fruits and vegetables eliminates the risk of heart disease.
- B) Only fruits and vegetables can reduce the risk of heart disease.
- C) There is a correlation between eating fruits and vegetables and a reduced risk of heart disease.
- D) People who eat fruits and vegetables will never get heart disease.

Correct Answer: C) There is a correlation between eating fruits and vegetables and a reduced risk of heart disease.

Explanation: The statement suggests a link or correlation but does not claim that eating fruits and vegetables completely eliminates the risk or is the only way to reduce it.

b) Analyzing the Information:

Once the information is understood, the next step is to analyze it critically. This involves evaluating the relationships between different pieces of information, identifying patterns, and considering

potential implications. Critical thinking skills are essential at this stage to assess the validity and relevance of the information.

Question 1: If all A are B, and some B are C, which of the following must be true?

- A) All A are C.
- B) Some A are not C.
- C) Some A are C.
- D) No A are C.

Correct Answer: C) Some A are C.

Explanation: Given that some B (which includes all A) are C, it logically follows that at least some A are also C. The relationship is partial, not absolute.

Question 2: During a sale, a store offers 20% off all items and an additional 10% off the discounted price for members. Which of the following is true?

- A) Members get a total of 30% off the original price.
- B) Non-members pay 80% of the original price.
- C) Members pay 72% of the original price.
- D) Members and non-members pay the same price.

Correct Answer: C) Members pay 72% of the original price.

Explanation: A 20% discount reduces the price to 80% of the original. An additional 10% off this discounted price (which is 10% of 80%, or 8% of the original price) results in a total payment of 72% of the original price by members.

c) Applying Logic and Reasoning:

Making judgments requires the application of logical principles and reasoning techniques. This may involve deductive reasoning, where conclusions are drawn based on premises that are assumed to be true, or inductive reasoning, where generalizations are made based on observations. The ability to apply logic helps in making reasoned and consistent judgments.

Question 1: If it rains, the picnic will be cancelled. It did not rain. What can we conclude?

- A) The picnic was cancelled.
- B) The picnic was not cancelled.
- C) It might rain later.
- D) The picnic went ahead as planned.

Correct Answer: D) The picnic went ahead as planned.

Explanation: The initial premise sets a condition for cancellation (rain). The absence of this condition logically suggests that the reason for cancellation did not occur, implying the picnic went ahead.

Question 2: Every person who passed the test studied hard. Alex passed the test. What does this imply about Alex?

- A) Alex did not study hard.
- B) Studying hard is not necessary to pass.
- C) Alex may have cheated on the test.
- D) Alex studied hard.

Correct Answer: D) Alex studied hard.

Explanation: The premise states a condition where passing the test is directly linked to studying hard. Since Alex passed, it logically follows that Alex studied hard.

d) Decision-Making:

Based on the analysis and application of logic, a decision or judgment must be made. This involves choosing among alternatives, predicting outcomes, or forming an opinion. The decision-making process should consider all relevant factors and aim to be as objective as possible.

Question 1: You have to choose between investing in stocks, which have high potential returns but high risk, or bonds, which have lower returns but are more stable. Which option is best if you want to minimize risk?

- A) Stocks
- B) Bonds
- C) Both in equal measure
- D) Neither

Correct Answer: B) Bonds

Explanation: Bonds are known for being more stable and having lower returns compared to stocks, making them the best option for minimizing risk.

Question 2: You're planning a trip and can choose a direct flight that is more expensive or a connecting flight that is cheaper but takes longer. What is the best option if saving money is your priority?

- A) Direct flight
- B) Connecting flight
- C) Cancel the trip
- D) Wait for a last-minute deal

Correct Answer: B) Connecting flight

Explanation: The connecting flight, despite being longer, is cheaper, making it the best option for those prioritizing saving money.

✓ **Dealing with Uncertainty:**

Often, the information available may not be complete or certain. In such cases, making judgments involves dealing with uncertainty. This requires the ability to estimate probabilities, make assumptions where necessary, and be prepared to revise judgments as new information becomes available.

Question 1: A weather forecast indicates a 60% chance of rain tomorrow. Based on this, which of the following is the most reasonable action?

- A) Carry an umbrella as a precaution.
- B) Assume it will not rain and make no preparations.
- C) Cancel all outdoor activities.
- D) Assume it will rain all day and stay indoors.

Correct Answer: A) Carry an umbrella as a precaution.

Explanation: Given the uncertainty of the weather (60% chance of rain), the most reasonable action is to prepare for the possibility of rain without drastically altering plans, hence carrying an umbrella.

Question 2: If a new medicine has a 75% success rate in treating a disease but has not been tested for long-term side effects, what is the most prudent approach for a doctor?

- A) Prescribe the medicine to all patients with the disease.
- B) Not prescribe the medicine until long-term effects are known.
- C) Prescribe the medicine only to those for whom other treatments have failed.
- D) Recommend the medicine as an over-the-counter option.

Correct Answer: C) Prescribe the medicine only to those for whom other treatments have failed.

Explanation: Given the uncertainty of long-term side effects, the most prudent approach is to limit the prescription to patients who might benefit the most and for whom other treatments haven't worked, balancing potential benefits against unknown risks.

✓ **Reflecting on Ethical Considerations:**

In many situations, making judgments also involves ethical considerations. This requires reflecting on moral principles, the potential impact of decisions on others, and societal norms. Ethical reasoning is an important component of the judgment-making process.

Question 1: A company has to decide between increasing profits by laying off workers or keeping all employees and accepting lower profits. Which option is ethically preferable?

- A) Increase profits by laying off workers.
- B) Keep all employees and accept lower profits.
- C) Lay off workers and donate a portion of the profits to charity.

D) Increase prices to keep all employees and maintain profits.

Correct Answer: B) Keep all employees and accept lower profits.

Explanation: From an ethical standpoint, prioritizing the well-being of employees and avoiding layoffs when possible reflects a commitment to social responsibility and the welfare of the workforce over maximizing profits.

Question 2: If a journalist has information that could prevent harm but might also invade someone's privacy, what is the most ethical course of action?

- A) Publish the information without consideration for privacy.
- B) Withhold the information to protect privacy.
- C) Seek a way to share the information without unnecessarily invading privacy.
- D) Alter the information to make it less invasive.

Correct Answer: C) Seek a way to share the information without unnecessarily invading privacy.

Explanation: Balancing the ethical duty to inform the public and prevent harm with the need to respect individual privacy is crucial. The most ethical approach involves finding a method to disseminate the information responsibly, minimizing harm while still achieving the public good.

✓ **Developing Intuition:**

While logical reasoning is central to making judgments, intuition also plays a role, especially in complex situations where not all variables can be logically analyzed. Developing intuition involves gaining experience, learning from past decisions, and being attuned to subconscious cues.

Question 1: A detective has several suspects for a crime, all with motives, but lacks concrete evidence. Relying on intuition, what should be the next step?

- A) Arrest the most likely suspect based on intuition.
- B) Dismiss intuition and wait for more evidence.
- C) Use intuition to prioritize suspects for further investigation.
- D) Release all suspects due to lack of evidence.

Correct Answer: C) Use intuition to prioritize suspects for further investigation.

Explanation: Intuition, developed from experience and expertise, can guide the investigative process by prioritizing where to focus further inquiry, rather than making conclusive decisions without evidence.

Question 2: When making a quick decision with incomplete information, how should one best use intuition?

- A) Follow intuition blindly.
- B) Ignore intuition in favor of any available data.
- C) Combine intuition with whatever data is available to make a decision.
- D) Delay the decision until more information is available.

Correct Answer: C) Combine intuition with whatever data is available to make a decision.

Explanation: In situations requiring swift action, the best approach is to blend intuition (informed by experience and subconscious cues) with available data. This method leverages both instinctual judgment and rational analysis, enabling more informed decision-making despite uncertainties.

Conclusion:

Making judgments is a complex process that involves understanding and analyzing information, applying logical reasoning, making decisions, dealing with uncertainty, considering ethical implications, and sometimes relying on intuition. Mastery of this process is essential for effective problem-solving and decision-making in both personal and professional contexts. Developing skills in logical reasoning, critical thinking, and ethical reasoning is crucial for making sound judgments.

Class 8: Theory of "Essential Parts" in Logical Reasoning

The topic of "Essential Parts" within the subject of Logical Reasoning focuses on understanding and identifying components that are indispensable to the existence or functioning of an entity. This concept is pivotal for dissecting complex systems, objects, or ideas into their fundamental elements, enabling individuals to grasp the core attributes that define or sustain them. The theory is grounded in the principle that certain elements are so crucial to the entity's existence that without them, the entity itself cannot be conceived or would cease to function as it is known.

a) Understanding Essential Parts:

At its core, the concept of "Essential Parts" necessitates identifying which components or attributes are absolutely necessary for the existence of a given entity. This involves a logical process of elimination and deduction, where the absence of these parts would result in the entity not fulfilling its definition, purpose, or function.

b) Application in Logical Reasoning:

This concept is widely applied in logical reasoning to solve problems, make decisions, and understand the world more deeply. For example, in analyzing arguments, one might identify the essential parts of an argument (premises and conclusion) to evaluate its validity. In design and engineering, understanding which components are essential can guide the creation of more efficient and effective systems.

c) Methodology:

A systematic approach to identifying essential parts involves several steps:

- ✓ **Definition:** Clearly define the entity being analyzed to understand its nature, purpose, and function.
- ✓ **Decomposition:** Break down the entity into its constituent components or attributes.
- ✓ **Evaluation:** Apply the principle, "A _____ could not exist without _____.", to each component to determine its necessity.
- ✓ **Synthesis:** Reconstruct the understanding of the entity, emphasizing the identified essential parts to appreciate its core structure or essence.

d) Types of Essential Parts:

- ✓ **Physical Components:** Tangible elements necessary for the physical existence of an object.
- ✓ **Functional Attributes:** Characteristics or properties critical for the performance or operation of a system.

- ✓ **Conceptual Elements:** Fundamental ideas or principles that form the basis of theoretical or abstract entities.

e) Practical Implications:

Understanding the essential parts of various entities has practical implications across disciplines:

- ✓ **Problem Solving:** Focuses efforts on critical components, leading to more efficient and effective solutions.
- ✓ **Critical Thinking:** Enhances the ability to analyze information, arguments, and ideas by identifying their foundational elements.
- ✓ **Innovation:** Identifies areas for improvement or innovation by understanding what is indispensable and what can be altered or removed.

f) Conclusion:

The theory of "Essential Parts" in Logical Reasoning equips individuals with a structured approach to dissect and understand the fundamental components that are crucial for the existence and functioning of entities. This analytical tool is invaluable in enhancing problem-solving capabilities, fostering critical thinking, and driving innovation by focusing on the core elements that define and sustain systems, objects, and ideas.

Type-1

► Directions to Solve

Each question has an underlined word followed by four answer choices. You will choose the word that is a necessary part of the underlined word.

1. harvest

- (A) autumn
- (B) stockpile
- (C) tractor
- (D) crop

Answer: Option (D)

Explanation:

To harvest something, one must have a crop, which is the essential element for this item. Autumn (choice a) is not the only time crops are harvested. There may not be enough of a crop to stockpile (choice b), and you can harvest crops without a tractor (choice c).

2. desert

- (A) cactus
- (B) arid
- (C) oasis
- (D) flat

Answer: Option (B)

Explanation:

A desert is an arid tract of land. Not all deserts are flat (choice d). Not all deserts have cacti or oases (choices a and c).

3. book

- (A) fiction
- (B) pages
- (C) pictures
- (D) learning

Answer: Option (B)

Explanation:

The necessary part of a book is its pages; there is no book without pages. Not all books are fiction (choice a), and not all books have pictures (choice c). Learning (choice d) may or may not take place with a book.

4. language

- (A) tongue
- (B) slang
- (C) writing
- (D) words

Answer: Option (D)

Explanation:

Words are a necessary part of language. Slang is not necessary to language (choice b). Not all languages are written (choice c). Not all languages are spoken (choice a).

5. school

- (A) student
- (B) report card
- (C) test
- (D) learning

Answer: Option (A)

Explanation:

Without students, a school cannot exist; therefore, students are the essential part of schools. The other choices may be related, but they are not essential.

6. pain

- (A) cut
- (B) burn
- (C) nuisance
- (D) hurt

Answer: Option (D)

Explanation:

Pain is suffering or hurt, so choice d is the essential element. Without hurt, there is no pain. A cut (choice a) or a burn (choice b) may cause pain, but so do many other types of injury. A nuisance (choice c) is an annoyance that may or may not cause pain.

7. gala

- (A) celebration
- (B) tuxedo
- (C) appetizer
- (D) orator

Answer: Option (A)

Explanation:

A gala indicates a celebration, the necessary element here. A tuxedo (choice b) is not required garb at a gala, nor is an appetizer (choice c). A gala may be held without the benefit of anyone speaking (choice d).

8. monopoly

- (A) corrupt
- (B) exclusive
- (C) rich
- (D) gigantic

Answer: Option (B)

Explanation:

The essential part of a monopoly is that it involves exclusive ownership or control.

9. guitar

- (A) band
- (B) teacher
- (C) songs
- (D) strings

Answer: Option (D)

Explanation:

A guitar does not exist without strings, so strings are an essential part of a guitar. A band is not necessary to a guitar (choice a). Guitar playing can be learned without a teacher (choice b). Songs are byproducts of a guitar (choice c).

10. election

- (A) president
- (B) voter
- (C) November
- (D) nation

Answer: Option (B)

Explanation:

An election does not exist without voters. The election of a president (choice a) is a byproduct. Not all elections are held in November (choice c), nor are they nationwide (choice d).

Type-2

► Directions to Solve

Find the word that names a necessary part of the underlined word.

1. ovation

- (A) outburst
- (B) bravo
- (C) applause
- (D) encore

Answer: Option (C)

Explanation:

An ovation is prolonged, enthusiastic applause, so applause is necessary to an ovation. An outburst (choice a) may take place during an ovation; "bravo" (choice b) may or may not be uttered; and an encore (choice d) would take place after an ovation.

2. bonus

- (A) reward
- (B) raise
- (C) cash
- (D) employer

Answer: Option (A)

Explanation:

A bonus is something given or paid beyond what is usual or expected, so reward is the essential element. A bonus may not involve a raise in pay or cash (choices b and c), and it may be received from someone other than an employer (choice d).

3. antique

- (A) rarity
- (B) artifact
- (C) aged
- (D) prehistoric

Answer: Option (C)

Explanation:

An antique is something that belongs to, or was made in, an earlier period. It may or may not be a rarity (choice a), and it does not have to be an artifact, an object produced or shaped by human craft (choice b). An antique is old but does not have to be prehistoric (choice d).

4. culture

- (A) civility
- (B) education
- (C) agriculture
- (D) customs

Answer: Option (D)

Explanation:

A culture is the behavior pattern of a particular population, so customs are the essential element. A culture may or may not be civil or educated (choices a and b). A culture may be an agricultural society (choice c), but this is not the essential element.

5. knowledge

- (A) school
- (B) teacher
- (C) textbook
- (D) learning

Answer: Option (D)

Explanation:

Knowledge is understanding gained through experience or study, so learning is the essential element. A school (choice a) is not necessary for learning or knowledge to take place, nor is a teacher or a textbook (choices b and c).

6. domicile

- (A) tenant
- (B) dwelling
- (C) kitchen
- (D) house

Answer: Option (B)

Explanation:

A domicile is a legal residence, so dwelling is the essential component for this item. You do not need a tenant (choice a) in the domicile, nor do you need a kitchen (choice c). A house (choice d) is just one form of a domicile (which could also be a tent, hogan, van, camper, motor home, apartment, dormitory, etc.).

7. vertebrate

- (A) backbone
- (B) reptile
- (C) mammal
- (D) animal

Answer: Option (A)

Explanation:

All vertebrates have a backbone. Reptiles (choice b) are vertebrates, but so are many other animals. Mammals (choice c) are vertebrates, but so are birds and reptiles. All vertebrates (choice d) are animals, but not all animals are vertebrates.

8. itinerary

- (A) map
- (B) route
- (C) travel
- (D) guidebook

Answer: Option (B)

Explanation:

An itinerary is a proposed route of a journey. A map (choice a) is not necessary to have a planned route. Travel (choice c) is usually the outcome of an itinerary, but not always. A guidebook (choice d) may be used to plan the journey but is not essential.

9. orchestra

- (A) violin
- (B) stage
- (C) musician
- (D) soloist

Answer: Option (C)

Explanation:

An orchestra is a large group of musicians, so musicians are essential. Although many orchestras have violin sections, violins aren't essential to an orchestra (choice a). Neither a stage (choice b) nor a soloist (choice d) is necessary.

10. facsimile

- (A) picture
- (B) image
- (C) mimeograph
- (D) copier

Answer: Option (B)

Explanation:

A facsimile must involve an image of some sort. The image or facsimile need not, however, be a picture (choice a). A mimeograph and a copier machine (choices c and d) are just two of the ways that images may be produced, so they do not qualify as the essential element for this item.

Type-3

► Directions to Solve

A good way to approach this type of question is to use the following sentence: "A _____ could not exist without _____. Find the word that names a necessary part of the underlined word.

1. wedding

- (A) love
- (B) church
- (C) ring
- (D) marriage

Answer: Option (D)

Explanation:

A wedding results in a joining, or a marriage, so choice d is the essential element. Love (choice a) usually precedes a wedding, but it is not essential. A wedding may take place anywhere, so a church (choice b) is not required. A ring (choice c) is often used in a wedding, but it is not necessary.

2. faculty

- (A) buildings
- (B) textbooks
- (C) teachers
- (D) meetings

Answer: Option (C)

Explanation:

A faculty consists of a group of teachers and cannot exist without them. The faculty may work in buildings (choice a), but the buildings aren't essential. They may use textbooks (choice b) and attend meetings (choice d), but these aren't essential either.

3. recipe

- (A) desserts
- (B) directions
- (C) cookbook
- (D) utensils

Answer: Option (B)

Explanation:

A recipe is a list of directions to make something. Recipes may be used to prepare desserts (choice a), among other things. One does not need a cookbook (choice c) to have a recipe, and utensils (choice d) may or may not be used to make a recipe.

4. autograph

- (A) athlete
- (B) actor
- (C) signature
- (D) pen

Answer: Option (C)

Explanation:

Without a signature, there is no autograph. Athletes and actors (choices a and b) may sign autographs, but they are not essential. An autograph can be signed with something other than a pen (choice d).

5. cage

- (A) enclosure
- (B) prisoner
- (C) animal
- (D) zoo

Answer: Option (A)

Explanation:

A cage is meant to keep something surrounded, so enclosure is the essential element. A prisoner (choice b) or an animal (choice c) are two things that may be kept in cages, among many other things. A zoo (choice d) is only one place that has cages.

6. champion

- (A) running
- (B) swimming
- (C) winning
- (D) speaking

Answer: Option (C)

Explanation:

Without a first-place win, there is no champion, so winning is essential. There may be champions in running, swimming, or speaking, but there are also champions in many other areas.

7. saddle

- (A) horse
- (B) seat
- (C) stirrups
- (D) horn

Answer: Option (B)

Explanation:

A saddle is something one uses to sit on an animal, so it must have a seat (choice b). A saddle is often used on a horse (choice a), but it may be used on other animals. Stirrups (choice c) are often found on a saddle but may not be used. A horn (choice d) is found on Western saddles, but not English saddles, so it is not the essential element here.

8. dome

- (A) rounded
- (B) geodesic
- (C) governmental
- (D) coppery

Answer: Option (A)

Explanation:

A dome is a large rounded roof or ceiling, so being rounded is essential to a dome. A geodesic dome (choice b) is only one type of dome. Some, but not all domes, have copper roofs (choice d). Domes are often found on government buildings (choice c), but domes exist in many other places.

9. glacier

- (A) mountain
- (B) winter
- (C) prehistory
- (D) ice

Answer: Option (D)

Explanation:

A glacier is a large mass of ice and cannot exist without it. A glacier can move down a mountain, but it can also move across a valley or a plain, which rules out choice a. Glaciers exist in all seasons, which rules out choice b. There are many glaciers in the world today, which rules out choice c.

10. directory

- (A) telephone
- (B) listing
- (C) computer
- (D) names

Answer: Option (B)

Explanation:

A directory is a listing of names or things, so (choice b) is the essential element. A telephone (choice a) often has a directory associated with it, but it is not essential. A computer (choice c) uses a directory format to list files, but it is not required. Names (choice d) are often listed in a directory, but many other things are listed in directories, so this is not the essential element.

Class – 9: Matching Definitions

The "Matching Definitions" topic under Logical Reasoning focuses on the cognitive process of aligning words, concepts, or phenomena with their correct explanations or definitions. This area of study is crucial for enhancing comprehension, vocabulary, analytical skills, and the ability to engage in precise communication. The theory underscores the importance of understanding not only the surface meaning of terms but also their deeper, contextual implications within various domains of knowledge.

a) Understanding Matching Definitions:

The core objective in matching definitions is to identify the correspondence between a term and its accurate description. This requires a nuanced understanding of language, context, and the interrelations between concepts. The process goes beyond mere memorization of terms; it involves critical thinking to discern subtleties and apply definitions appropriately across different contexts.

➤ Key Components:

- ✓ **Definition Identification:** Recognizing the essential characteristics that constitute a concept's meaning.
- ✓ **Conceptual Analysis:** Breaking down complex definitions into simpler, understandable components.
- ✓ **Contextual Application:** Considering how the meaning of terms might shift based on the context in which they are used.
- ✓ **Synthesis:** Integrating understanding from various sources to identify the most accurate match between a term and its definition.

➤ Methodology:

A systematic approach to mastering matching definitions involves several steps:

- ✓ **Familiarization:** Develop a broad understanding of a wide range of concepts and their potential definitions.
- ✓ **Analysis:** Examine definitions carefully, noting key words and phrases that capture the essence of the concept.
- ✓ **Comparison:** Evaluate how closely each term aligns with the given definitions, looking for direct matches and eliminating mismatches.
- ✓ **Context Consideration:** Take into account any contextual clues that might affect the meaning of the terms or definitions.
- ✓ **Decision Making:** Choose the definition that most accurately and completely matches the term, based on analysis and contextual understanding.

➤ Applications:

The skill of matching definitions finds application in various fields and activities:

- ✓ **Academic Learning:** Enhances comprehension and retention of subject matter across disciplines.
- ✓ **Standardized Testing:** Crucial for success in verbal reasoning sections of exams, where precise understanding of terms is tested.
- ✓ **Professional Communication:** Improves the ability to convey complex ideas clearly and accurately in the workplace.
- ✓ **Critical Reading:** Enables deeper engagement with texts by ensuring accurate interpretation of the author's vocabulary.

➤ Enhancing Skills:

Improving one's ability to match definitions with terms involves:

- ✓ **Expanding Vocabulary:** Regularly learning new words and concepts to broaden your lexical database.
- ✓ **Engaging with Contextual Usage:** Reading widely across genres to see how words are used in different contexts.
- ✓ **Practicing Logical Deduction:** Using reasoning skills to deduce meanings of unfamiliar terms based on known roots or contextual hints.
- ✓ **Utilizing Educational Resources:** Leveraging dictionaries, thesauruses, and educational platforms to study and review terms and definitions.

➤ Conclusion:

The theory of "Matching Definitions" in Logical Reasoning is foundational for developing precise language skills, enhancing comprehension, and fostering effective communication. By systematically studying terms and their definitions, critically analyzing context, and applying logical deduction, individuals can significantly improve their reasoning abilities, academic performance, and professional efficacy.

➤ Questions

Question: What is an essential part of a book?

- A) Table of contents
- B) Author
- C) Pages
- D) Cover
- E) Summary

Answer: C) Pages

Explanation: While other elements like the cover, author, and table of contents are common and important to a book, the only element that is absolutely essential for a book to be considered a book is its pages, where the text is printed. Without pages, a book cannot fulfill its primary function of conveying written information.

Question: Which term best matches the definition: "The study of the nature, causes, or principles of reality, knowledge, or values, based on logical reasoning"?

- A) Psychology
- B) Sociology
- C) Philosophy
- D) Anthropology
- E) Theology

Answer: C) Philosophy

Explanation: Philosophy is the discipline that fits the definition provided, as it involves the systematic study and questioning of existential, epistemological, and moral realities through logical analysis and argumentation.

Question: If a plant requires sunlight to grow, which environment is best suited for its growth?

- A) A dark room
- B) Underneath a dense canopy
- C) An open field with daily sunlight
- D) Inside a cave
- E) In the shade of a tall building

Answer: C) An open field with daily sunlight

Explanation: Given the premise that the plant requires sunlight for growth, the best judgment is an environment that provides ample sunlight. An open field with daily sunlight exposure directly satisfies this requirement without the limitations posed by

Situation: You are tasked with designing a minimalist smartphone focused on essential functions for users who are overwhelmed by modern smartphones' complexity. Considering the need for simplicity and functionality, which component is essential for the smartphone?

- A) High-resolution camera
- B) Basic calling and texting capabilities

- C) Social media apps pre-installed
- D) Virtual reality compatibility
- E) 5G connectivity

Answer: B) Basic calling and texting capabilities

Explanation: For a minimalist smartphone, the essential part is its ability to perform the most basic functions for which phones were originally designed: calling and texting. While other features like high-resolution cameras and 5G connectivity enhance user experience, the core functionality of communication through calls and texts is indispensable, especially for the target users seeking simplicity.

Situation: A team of researchers is developing an AI system to assist in medical diagnosis. The system's design is based on a particular method of reasoning to suggest diagnoses based on symptoms presented by patients. Which reasoning method best matches the definition of "drawing specific conclusions from general principles"?

- A) Inductive reasoning
- B) Deductive reasoning
- C) Abductive reasoning
- D) Analogical reasoning
- E) Empirical reasoning

Answer: B) Deductive reasoning

Explanation: Deductive reasoning involves applying general principles

Title: Identifying Essential Components for a Minimalist Smartphone

Situation: You are leading a project to design a minimalist smartphone aimed at users seeking simplicity. The goal is to strip down to the most essential functions that meet the primary needs of communication and basic usage, avoiding the complexity and distractions of modern smartphones.

Question: Considering the minimalist philosophy, which component is absolutely essential for the smartphone to serve its purpose?

- A) High-resolution camera
- B) Basic calling and texting capabilities
- C) Social media apps pre-installed
- D) Virtual reality compatibility
- E) 5G connectivity

Answer: B) Basic calling and texting capabilities

Explanation: The essence of a phone lies in its ability to facilitate communication. For a minimalist smartphone, ensuring that users can make calls and send texts is paramount, as these are the foundational functions of a mobile phone. Other features, while beneficial, are secondary to this core requirement.

Title: Selecting Reasoning Methods for AI Diagnostic Systems

Situation: Your team is at the forefront of integrating artificial intelligence into medical diagnostics. The project aims to create an AI system that can accurately suggest potential diagnoses based on patient symptoms and medical history. The success of the system hinges on choosing the correct method of logical reasoning to process the information.

Question: Which reasoning method is most aligned with the definition "drawing specific conclusions from general principles" and thereby best suited for developing the AI diagnostic system?

- A) Inductive reasoning
- B) Deductive reasoning
- C) Abductive reasoning
- D) Analogical reasoning
- E) Empirical reasoning

Answer: B) Deductive reasoning

Explanation: Deductive reasoning is the process of applying general rules or principles to specific instances to draw conclusions. In the context of an AI diagnostic system, deductive reasoning allows the system to apply known medical knowledge and principles to the specific symptoms and information of a patient to suggest accurate diagnoses.

Title: Deciding on a Sustainable Urban Development Project

Situation: As an urban planner, you're evaluating proposals for a new development project aimed at enhancing the city's sustainability and livability. The project must address critical urban challenges, including housing, transportation, and green spaces. The city council will base its decision on which proposal promises the most holistic approach to sustainable urban development.

Question: Based on the need for a comprehensive solution to urban sustainability, which project proposal should be prioritized?

- A) A high-density housing complex with minimal green spaces
- B) An extensive network of roads and highways to improve transportation
- C) A mixed-use development with housing, public transit access, and green spaces
- D) A large shopping center to boost the local economy
- E) A technology park to attract high-tech companies

Answer: C) A mixed-use development with housing, public transit access, and green spaces

Explanation: The mixed-use development proposal offers a holistic approach to urban sustainability by combining essential housing with accessible public transportation and green spaces. This multifaceted solution addresses several urban challenges simultaneously, promoting not only environmental sustainability but also enhancing the quality of urban life.

Emergency Evacuation Plan

Situation: A city is developing an emergency evacuation plan for natural disasters. What is the most critical element to include?

- A) Evacuation routes
- B) List of shelters
- C) Public awareness campaigns
- D) Stockpile of emergency supplies
- E) Disaster insurance policies

Answer: A) Evacuation routes

Explanation: Evacuation routes are essential for guiding residents safely out of danger zones during a disaster. While all options contribute to a comprehensive emergency plan, the immediate need for clear and accessible evacuation routes is critical for preventing chaos and ensuring swift departures.

Library System Upgrade

Situation: A public library is upgrading its system to improve user experience. Which feature should be prioritized?

- A) Virtual reality reading rooms
- B) Online reservation system
- C) Coffee shop
- D) Expanded parking lot
- E) 3D printing services

Answer: B) Online reservation system

Explanation: An online reservation system directly improves user access to library resources, allowing for efficient planning and management of visits and resource use. This feature enhances the overall user experience by making it easier for patrons to engage with library services.

School Nutrition Program

Situation: A school district aims to improve student health through a new nutrition program. What should be the program's focus?

- A) Increasing physical education time
- B) Providing free fruit and vegetable snacks
- C) Banning soda machines
- D) Offering cooking classes
- E) Implementing a fast-food ban

Answer: B) Providing free fruit and vegetable snacks

Explanation: Offering free fruit and vegetable snacks directly addresses the goal of improving student health by increasing their daily intake of essential nutrients and encouraging healthier eating habits, making it a fundamental component of a nutrition program.

Workplace Productivity

Situation: A company wants to enhance workplace productivity. Which initiative should be implemented first?

- A) Flexible work hours
- B) Team-building retreats
- C) Open office layout
- D) Upgraded technology tools
- E) Professional development workshops

Answer: D) Upgraded technology tools

Explanation: Upgrading technology tools directly impacts employee efficiency and effectiveness by reducing time spent on tasks and improving the quality of work. While other initiatives promote morale and may indirectly boost productivity, having the right tools is immediately transformative in enabling better performance.

Urban Water Conservation

Case Study: A city faces water scarcity due to prolonged drought. Officials plan to implement a water conservation program. They consider restrictions on lawn watering, incentives for water-saving appliances, public education campaigns, and infrastructure improvements to reduce leakage.

Question: Which strategy should be prioritized to have the most significant immediate impact on water conservation?

- A) Restrictions on lawn watering

- B) Incentives for water-saving appliances
- C) Public education campaigns
- D) Infrastructure improvements
- E) Rainwater harvesting initiatives

Answer: D) Infrastructure improvements

Explanation: Infrastructure improvements to reduce leakage can have a significant and immediate impact on conserving water by addressing losses directly at the source. While behavioral changes and incentives are valuable, systemic infrastructure fixes provide foundational solutions that enhance the efficiency of the entire water supply system.

Revitalizing Downtown

Case Study: A small town seeks to revitalize its declining downtown area. Proposals include attracting a major retailer, developing a pedestrian-friendly zone, offering small business grants, hosting weekly farmers' markets, and renovating historic buildings for new uses.

Question: Which proposal should be prioritized to stimulate economic growth and increase foot traffic downtown?

- A) Attracting a major retailer
- B) Developing a pedestrian-friendly zone
- C) Offering small business grants
- D) Hosting weekly farmers' markets
- E) Renovating historic buildings

Answer: B) Developing a pedestrian-friendly zone

Explanation: Creating a pedestrian-friendly zone addresses the core issue of making downtown more accessible and inviting, which can naturally stimulate economic growth and increase foot traffic. This approach encourages community engagement, supports local businesses, and enhances the overall appeal of the downtown area.

Renewable Energy Initiative

Situation: A local government is deciding on an initiative to promote renewable energy use among homeowners. Which incentive should they prioritize?

- A) Tax rebates for solar panel installation
- B) Free public workshops on energy conservation
- C) Subsidies for energy-efficient appliances
- D) Mandatory solar panel installations for new homes

E) A public campaign promoting the benefits of renewable energy

Answer: A) Tax rebates for solar panel installation

Explanation: Tax rebates for solar panel installation directly incentivize homeowners to adopt renewable energy by making it more financially accessible. This measure has the potential for immediate impact by reducing the initial cost barrier associated with solar panel installations.

Traffic Congestion Solution

Situation: A city is facing severe traffic congestion in its downtown area. Which solution should be implemented first to alleviate this issue?

- A) Increase public transportation options
- B) Build more parking garages
- C) Implement congestion pricing
- D) Encourage carpooling through incentives
- E) Expand existing roadways

Answer: A) Increase public transportation options

Explanation: Increasing public transportation options offers a sustainable solution to traffic congestion by providing residents with alternatives to driving. This can significantly reduce the number of vehicles on the road, addressing the root cause of congestion.

Improving School Attendance

Case Study: A school district notices a decline in student attendance rates. They consider several strategies to address this issue, including updating the curriculum to make it more engaging, introducing flexible schooling hours, enforcing stricter attendance policies, offering breakfast programs, and providing transportation assistance.

Question: Which strategy should be prioritized to most effectively improve student attendance?

- A) Updating the curriculum
- B) Introducing flexible schooling hours
- C) Enforcing stricter attendance policies
- D) Offering breakfast programs
- E) Providing transportation assistance

Answer: D) Offering breakfast programs

Explanation: Offering breakfast programs addresses a fundamental need by ensuring that students do not attend school on an empty stomach, which can be a significant barrier to attendance for some. This strategy not only encourages students to come to school but also supports their ability to learn effectively.

Boosting Local Tourism

Case Study: A coastal town wants to boost tourism while preserving its natural beauty and cultural heritage. Proposals include developing luxury resorts, creating nature reserves, promoting local arts and crafts, establishing culinary tours, and organizing cultural festivals.

Question: Which proposal should be prioritized to enhance tourism sustainably?

- A) Developing luxury resorts
- B) Creating nature reserves
- C) Promoting local arts and crafts
- D) Establishing culinary tours
- E) Organizing cultural festivals

Answer: B) Creating nature reserves

Explanation: Creating nature reserves not only protects the town's natural beauty and biodiversity but also attracts tourists interested in sustainable and ecologically responsible travel. This approach leverages the town's natural assets while promoting conservation.

► Directions to Solve

Read each definition and all four choices carefully, and find the answer that provides the best example of the given definition.

1. **Applying for Seasonal Employment** occurs when a person requests to be considered for a job that is dependent on a particular season or time of year. Which situation below is the best example of Applying for Seasonal Employment?

- (A) The ski instructors at Top of the Peak Ski School work from December through March.
- (B) Matthew prefers jobs that allow him to work outdoors.
- (C) Lucinda makes an appointment with the beach resort restaurant manager to interview for the summer waitressing position that was advertised in the newspaper.
- (D) Doug's ice cream shop stays open until 11 p.m. during the summer months.

Answer: Option (C)

Explanation:

Although the ski instructors at Top of the Peak Ski School do work seasonally, choice a does not describe anyone applying for seasonal employment. In choice b, the statement that Matthew likes to work outdoors tells us nothing about seasonal employment or someone applying for it. And although choice d describes a business with seasonal hours, it does not describe a person applying for seasonal work. Choice c, on the other hand, very specifically depicts a person, Lucinda, who is applying for a job as a summer waitress at a beach resort, which is dependent upon a particular season of the year.

2. **Violating an Apartment Lease** occurs when a tenant does something prohibited by the legally binding document that he or she has signed with a landlord. Which situation below is the best example of Violating an Apartment Lease?
- (A) Tim has decided to move to another city, so he calls his landlord to tell him that he is not interested in renewing his lease when it expires next month.
 - (B) Valerie recently lost her job and, for the last three months, has neglected to pay her landlord the monthly rent they agreed upon in writing when she moved into her apartment eight months ago.
 - (C) Mark writes a letter to his landlord that lists numerous complaints about the apartment he has agreed to rent for two years.
 - (D) Leslie thinks that her landlord is neglecting the building in which she rents an apartment. She calls her attorney to ask for advice.

Answer: Option (B)

Explanation:

Valerie signed a legally binding document that requires her to pay a monthly rent for her apartment and she has failed to do this for the last three months. Therefore, she has violated her apartment lease.

3. An **Informal Gathering** occurs when a group of people get together in a casual, relaxed manner. Which situation below is the best example of an Informal Gathering?
- (A) The book club meets on the first Thursday evening of every month.
 - (B) After finding out about his promotion, Jeremy and a few coworkers decide to go out for a quick drink after work.
 - (C) Mary sends out 25 invitations for the bridal shower she is giving for her sister.
 - (D) Whenever she eats at the Mexican restaurant, Clara seems to run into Peter.

Answer: Option (B)

Explanation:

After getting some good news, Jeremy and a few friends casually get together for a drink after work, thereby having an informal gathering. Choices a and c describe more formal types of gatherings. Choice d describes a chance or coincidental kind of meeting.

4. People **speculate** when they consider a situation and assume something to be true based on inconclusive evidence. Which situation below is the best example of Speculation ?
- (A) Francine decides that it would be appropriate to wear jeans to her new office on Friday after reading about "Casual Fridays" in her employee handbook.
 - (B) Mary spends thirty minutes sitting in traffic and wishes that she took the train instead of driving.
 - (C) After consulting several guidebooks and her travel agent, Jennifer feels confident that the hotel she has chosen is first-rate.
 - (D) When Emily opens the door in tears, Theo guesses that she's had a death in her family.

Answer: Option (D)

Explanation:

This is the only situation in which someone makes an assumption that is not based on conclusive evidence. Choices a and c reflect situations in which assumptions are made based on evidence. In choice b, Mary is not assuming anything to be true. She is simply wishing that she'd made a different decision.

5. **Posthumous Publication** occurs when a book is published after the author's death. Which situation below is the best example of Posthumous Publication?

- (A) Richard's illness took his life before he was able to enjoy the amazing early reviews of his novel.
- (B) Melissa's publisher cancels her book contract after she fails to deliver the manuscript on time.
- (C) Clarence never thought he'd live to see the third book in his trilogy published.
- (D) Elizabeth is honored with a prestigious literary award for her writing career and her daughter accepts the award on behalf of her deceased mother.

Answer: Option (A)

Explanation:

Although choice d also mentions a writer who has died, it does not state that one of the writer's books was published after her death, only that she received an award. Choice a states that Richard wasn't around to see the early reviews of his novel, therefore implying that Richard died before the book was published. The other two options depict living writers.

6. A **Guarantee** is a promise or assurance that attests to the quality of a product that is either (1) given in writing by the manufacturer or (2) given verbally by the person selling the product. Which situation below is the best example of a Guarantee?

- (A) Melissa purchases a DVD player with the highest consumer ratings in its category.
- (B) The salesperson advises Curt to be sure that he buys an air conditioner with a guarantee.
- (C) The local auto body shop specializes in refurbishing and selling used cars.
- (D) Lori buys a used digital camera from her coworker who says that she will refund Lori's money if the camera's performance is not of the highest quality.

Answer: Option (D)

Explanation:

Choices a, b, and c do not describe situations in which a product is guaranteed. Only choice d reflects a situation in which a seller attests to the quality of a product by giving the buyer a promise or assurance about its quality.

7. The rules of baseball state that a batter **Legally Completes His Time at Bat** when he is put out or becomes a base runner. Which situation below is the best example of a batter Legally Completing His Time at Bat?

- (A) Jared's blooper over the head of the short-stop puts him in scoring position.
- (B) The umpire calls a strike, even though the last pitch was way outside.
- (C) The pitcher throws his famous knuckleball, Joe swings and misses, and the umpire calls a strike.
- (D) The count is two balls and two strikes as Mario waits for the next pitch.

Answer: Option (A)

Explanation:

The fact that Jared is in scoring position due to his blooper indicates that he has hit the ball and is now a base runner; therefore, he has legally completed his time at bat. Choices b and c both describe situations in which a strike is called, but they do not state that the batter has been put out or that he is now a base runner. Choice d describes a situation in which the batter, Mario, is still at the plate waiting for the next pitch.

Class 10: Verbal Reasoning

a) Verbal Reasoning: An Integral Component of Logical Reasoning

Verbal reasoning, a critical subset of logical reasoning, involves the ability to understand and logically work through concepts and problems expressed in words. It plays a pivotal role in a wide array of cognitive tasks, from standardized testing to everyday decision-making, by requiring individuals to analyze, synthesize, and apply verbal information. This theory explores the foundational elements of verbal reasoning, its applications, and strategies for enhancement.

b) Foundations of Verbal Reasoning

Verbal reasoning is grounded in the comprehension and manipulation of language. It demands not only an understanding of the words themselves but also the structure of the language, the meanings behind the words, and the inferences that can be drawn from them. Core components include:

- ✓ **Vocabulary Knowledge:** A broad vocabulary aids in the accurate interpretation of information.
- ✓ **Reading Comprehension:** The ability to understand, interpret, and critically analyze texts.
- ✓ **Critical Thinking:** Evaluating arguments, identifying assumptions, drawing conclusions, and making inferences.
- ✓ **Logical Analysis:** The capacity to follow or construct logical arguments and to understand causal relationships.

c) Types of Verbal Reasoning Questions

Verbal reasoning tests commonly feature a variety of question types, including but not limited to:

- ✓ **Analogies:** Determining relationships between words.
- ✓ **Sentence Completion:** Choosing words or phrases that best complete a sentence.
- ✓ **Critical Reasoning:** Evaluating arguments, identifying strengths and weaknesses.
- ✓ **Reading Comprehension:** Answering questions based on a given passage.
- ✓ **Syllogisms:** Deductive reasoning to draw conclusions from premises.

d) Applications of Verbal Reasoning

Verbal reasoning is ubiquitous, with applications extending across numerous fields and aspects of daily life:

- ✓ **Academic Research and Study:** Understanding complex texts, formulating hypotheses, and constructing arguments.

- ✓ **Professional Communication:** Effective speaking and writing, persuasive argumentation, and clear presentation of ideas.
- ✓ **Standardized Testing:** A key component of exams such as the SAT, GRE, GMAT, and various civil service tests.
- ✓ **Legal Analysis:** Interpreting statutes, constructing legal arguments, and understanding judicial opinions.
- ✓ **Everyday Problem Solving:** Making informed decisions based on written or spoken information.

e) Enhancing Verbal Reasoning Skills

Improvement in verbal reasoning can be achieved through targeted practice and strategies:

- ✓ **Expand Vocabulary:** Engage with a wide range of texts, learn new words, and use them in context.
- ✓ **Practice Reading Comprehensively:** Read regularly and critically, from fiction to academic journals, to improve comprehension and analytical skills.
- ✓ **Engage in Discussion and Debate:** This helps sharpen the ability to form coherent arguments and to reason verbally.
- ✓ **Solve Practice Problems:** Regularly engage with verbal reasoning exercises and puzzles to build familiarity with question types and logic patterns.
- ✓ **Reflect on Mistakes:** Reviewing incorrect answers can provide insights into weaknesses and misunderstandings.

f) Conclusion

Verbal reasoning is a fundamental skill within logical reasoning that enhances our ability to process, understand, and articulate ideas effectively. By fostering these skills, individuals can improve their cognitive capabilities, academic performance, professional success, and the quality of their everyday decision-making.

Questions

1. Analogies

Question: Pen is to Write as Knife is to _____.

- A) Cut
- B) Sharp
- C) Metal
- D) Handle
- E) Point

Answer: A) Cut

Explanation: The relationship between the first pair of words is that of tool to action. A pen is used to write, just as a knife is used to cut. Choices B, C, D, and E describe attributes or parts of a knife but do not represent the action performed with it.

Question 2: Tree is to Forest as Book is to _____.

- A) Page
- B) Library
- C) Author
- D) Reading
- E) Shelf

Answer: B) Library

Explanation: A tree is a single unit that, when grouped with others, forms a forest. Similarly, a book is a single unit that, when grouped with others, forms a library. This analogy compares the relationship of a part to its collective whole.

Question 3: Water is to Ice as Lava is to _____.

- A) Fire
- B) Mountain
- C) Rock
- D) Heat
- E) Volcano

Answer: C) Rock

Explanation: Water freezes to become ice, undergoing a state change from liquid to solid. Similarly, lava cools down to become rock, also transitioning from a liquid to a solid state. The analogy is based on the process of changing states.

Question 4: Doctor is to Hospital as Teacher is to _____.

- A) Classroom
- B) School
- C) Student
- D) Book
- E) Lesson

Answer: B) School

Explanation: A doctor primarily works in a hospital, and similarly, a teacher primarily works in a school. This analogy compares the professional to their primary place of work.

Question 5: Whisper is to Shout as Walk is to _____.

- A) Run
- B) Jump
- C) Stand
- D) Sit
- E) Move

Answer: A) Run

Explanation: Whispering and shouting represent low and high volumes of speaking, respectively. Similarly, walking and running represent slower and faster paces of movement, respectively. This analogy compares the intensity or speed of actions.

2. Sentence Completion

Question 1: Despite the heavy rain, the team's morale remained _____ as they were determined to win the match.

- A) dampened
- B) undeterred
- C) saturated
- D) dissolved

E) weakened

Answer: B) undeterred

Explanation: The context of the sentence suggests that the team's spirit was not negatively affected by the rain, implying they remained determined. "Undeterred" fits this context as it means not discouraged or dissuaded, whereas the other options suggest a negative impact on morale.

Question 2: Despite the _____ evidence presented in court, the jury remained skeptical of the defendant's guilt.

A) circumstantial

B) conclusive

C) irrelevant

D) fabricated

E) insufficient

Answer: B) Conclusive

Explanation: "Conclusive" evidence suggests that the evidence should be strong enough to establish guilt or innocence. The sentence implies a contrast between the strong evidence and the jury's skepticism, making "conclusive" the best fit.

Question 3: The new policy aims to _____ the economic disparity in the city by providing equal opportunities for all citizens.

A) exacerbate

B) overlook

C) mitigate

D) ignore

E) increase

Answer: C) Mitigate

Explanation: The context of the sentence suggests the policy's goal is to reduce or lessen economic disparity, making "mitigate" the correct choice as it means to make less severe or serious.

Question 4: Her argument was so _____ that it left everyone in the room speechless, unable to counter her points.

A) weak

B) convoluted

- C) compelling
- D) irrelevant
- E) mundane

Answer: C) Compelling

Explanation: The effect of the argument (leaving everyone speechless) suggests it was powerful and convincing, which is what "compelling" means. The other options do not logically fit the outcome described.

Question 5: The CEO's decision to invest in renewable energy was _____ by her commitment to environmental sustainability.

- A) confused
- B) contradicted
- C) motivated
- D) deterred
- E) undermined

Answer: C) Motivated

Explanation: The sentence indicates a cause-and-effect relationship between the CEO's commitment and her decision, making "motivated" the correct choice as it suggests her action was driven by her commitment to sustainability.

3. Critical Reasoning

Question 1: A recent study suggests that people who drink at least three cups of coffee a day are less likely to develop heart disease compared to those who do not drink coffee. Based on this study, which of the following conclusions is most appropriate?

- A) Coffee is the most effective way to prevent heart disease.
- B) Drinking less than three cups of coffee a day offers no health benefits.
- C) Coffee directly causes improved heart health.
- D) There may be a correlation between coffee consumption and lower risk of heart disease.
- E) Everyone should drink three cups of coffee a day to avoid heart disease.

Answer: D) There may be a correlation between coffee consumption and lower risk of heart disease.

Explanation: The study suggests a relationship between coffee consumption and heart health, but it does not establish causation or the effectiveness of coffee compared to other preventive measures. Option D is the most appropriate as it correctly identifies the nature of the study's finding as a correlation, not causation or a direct recommendation.

Question 2: It is argued that decreasing the legal working hours will lead to higher productivity as employees will be less fatigued and more focused. Which of the following, if true, would weaken this argument?

- A) Studies show that shorter working hours have led to increased job satisfaction among employees.
- B) Some countries with shorter working hours have reported a decrease in overall economic output.
- C) Employees often report feeling more energized and productive after work-related travel.
- D) Many companies have successfully implemented flexible working schedules without reducing total working hours.
- E) Research indicates that breaks throughout the day contribute more to productivity than shorter working hours.

Answer: B) Some countries with shorter working hours have reported a decrease in overall economic output.

Explanation: Option B directly challenges the argument by suggesting that shorter working hours could lead to less productivity on a larger scale, as evidenced by a decrease in economic output. This contradicts the claim that reduced hours will increase productivity.

Question 3: Proponents of the new urban development plan argue that it will enhance the city's appeal and attract more tourists, leading to economic growth. However, critics argue that the plan will disproportionately benefit wealthier citizens and increase living costs. Which of the following, if true, best supports the critics' argument?

- A) The plan includes the construction of luxury hotels and upscale shopping centers.
- B) Previous urban development plans have generally led to an increase in tourism.
- C) The city's current infrastructure is inadequate to support an influx of tourists.
- D) Many small businesses support the development plan.
- E) The development plan includes measures to improve public transportation.

Answer: A) The plan includes the construction of luxury hotels and upscale shopping centers.

Explanation: Option A supports the critics' argument by suggesting that the development plan focuses on high-end amenities likely to benefit wealthier citizens and potentially increase living costs, rather than providing inclusive benefits for all city residents.

Question 4: A study found that children who play video games for more than two hours a day tend to have better problem-solving skills than those who play less. Therefore, parents should encourage their children to play video games to enhance these skills. Which of the following, if true, would weaken this recommendation?

- A) Many educational video games are specifically designed to improve problem-solving skills.
- B) Excessive video game play has been linked to decreased physical activity and social interaction.
- C) Some children who play video games for long periods show improved hand-eye coordination.
- D) Parents often report difficulty in limiting their children's video game time to educational content only.
- E) Schools are increasingly incorporating video game-based learning into their curricula.

Answer: B) Excessive video game play has been linked to decreased physical activity and social interaction.

Explanation: Option B weakens the recommendation by highlighting significant negative consequences of playing video games for extended periods, suggesting that the potential benefits to problem-solving skills may not outweigh the drawbacks related to physical and social health.

Question 5: Critics argue that implementing a flat tax rate would simplify the tax code and make it fairer for everyone. However, opponents contend that a flat tax would disproportionately benefit high-income earners at the expense of lower-income individuals. Which of the following, if true, best supports the opponents' contention?

- A) A flat tax system would eliminate many of the deductions and credits available under the progressive tax system.
- B) Countries with a flat tax system have shown more economic stability over the years.
- C) High-income earners are more likely to invest their savings from tax cuts into the economy.
- D) Lower-income individuals tend to spend a higher percentage of their income on necessities.
- E) The administrative costs of collecting taxes would be significantly reduced under a flat tax system.

Answer: D) Lower-income individuals tend to spend a higher percentage of their income on necessities.

Explanation: Option D supports the opponents' contention by suggesting that lower-income individuals, who allocate a larger portion of their income to essentials, would be more adversely affected by a flat tax rate. This implies that the burden of taxation would become relatively heavier for them compared to high-income earners, validating the opponents' argument.

4. Reading Comprehension

Question: Based on the passage below, which of the following statements is true?

"Public libraries play a crucial role in providing free access to information and resources. Beyond books, many libraries offer community programs, internet access, and spaces for study and collaboration."

- A) Public libraries charge fees for internet access.

- B) Community programs are seldom found in public libraries.
- C) Public libraries offer more than just books.
- D) Study spaces are becoming less common in public libraries.
- E) Collaboration is discouraged in public libraries.

Answer: C) Public libraries offer more than just books.

Explanation: The passage explicitly states that public libraries provide not only books but also community programs, internet access, and spaces for study and collaboration, making option C the only true statement based on the passage. The other options either contradict the passage's information or introduce unsupported claims.

Passage 2: Renewable Energy

In recent years, the shift towards renewable energy sources has accelerated. Solar and wind power, in particular, have seen significant advancements, making them more viable as primary energy sources. Governments worldwide have begun to recognize the importance of transitioning away from fossil fuels to combat climate change and reduce carbon footprints. This transition not only benefits the environment but also creates new jobs in the green energy sector. However, the initial investment in renewable energy infrastructure can be high, leading to debates on the best strategies for funding these projects. Despite these challenges, the long-term benefits of renewable energy, such as sustainability and reduced pollution, make it a crucial endeavor for the global community.

Question: What is the primary focus of the passage?

- A) The economic challenges of renewable energy
- B) Job creation in the green energy sector
- C) The advancement in solar and wind power technologies
- D) The global shift towards renewable energy sources
- E) Debates on funding renewable energy projects

Answer: D) The global shift towards renewable energy sources

Explanation: The passage discusses various aspects of renewable energy, including advancements in technology, government involvement, job creation, and funding challenges. However, the overarching theme is the global shift towards renewable energy as a means to combat climate change and promote sustainability, making D the correct answer.

Passage 3: The Digital Divide

The digital divide refers to the gap between individuals who have access to modern information and communication technology (ICT) and those who do not. This divide exists not only across socioeconomic lines within countries but also between developed and developing nations. Access to the internet, computers, and digital literacy skills are essential for participating fully in today's economy and society.

The consequences of the digital divide include disparities in educational opportunities, employment, and access to government services. Efforts to bridge the digital divide have included public-private partnerships to provide affordable technology and internet access, as well as initiatives to enhance digital literacy. Addressing this divide is critical for ensuring that all members of society can benefit from the digital age.

Question: What best describes the consequences of the digital divide mentioned in the passage?

- A) Increased digital literacy worldwide
- B) Uniform access to technology across nations
- C) Disparities in educational and employment opportunities
- D) Effective public-private partnerships
- E) Global economic stability

Answer: C) Disparities in educational and employment opportunities

Explanation: The passage specifically mentions that the digital divide leads to disparities in educational opportunities, employment, and access to government services. Option C directly addresses these consequences, making it the correct choice.

Passage 4: Urban Green Spaces

Urban green spaces, such as parks, gardens, and riverbanks, play a crucial role in enhancing city life. They provide residents with areas for recreation, relaxation, and socialization, contributing to the overall well-being and quality of life. Beyond their recreational value, these spaces offer environmental benefits, including improving air quality, reducing urban heat islands, and supporting biodiversity. City planners increasingly recognize the importance of integrating green spaces into urban development to promote sustainable living. Challenges in expanding urban green spaces include land availability, maintenance costs, and competing urban development priorities. Despite these challenges, the push for more green spaces reflects a growing understanding of their multifaceted benefits for urban populations.

Question: What is emphasized as a significant benefit of urban green spaces?

- A) The reduction of maintenance costs
- B) The increase in land availability for development
- C) The contribution to environmental well-being and biodiversity
- D) The prioritization of urban development projects
- E) The promotion of digital literacy

Answer: C) The contribution to environmental well-being and biodiversity

Explanation: The passage highlights several benefits of urban green spaces, including recreational, social, and environmental advantages. Among these, the environmental benefits, such as improving air quality and supporting biodiversity, are specifically emphasized, making option C the correct answer.

Passage 5: The Future of Work

The future of work is being shaped by rapid technological advancements and changing societal needs. Automation, artificial intelligence (AI), and remote work are transforming how and where people work. While technology offers opportunities for increased efficiency and new types of jobs, it also poses challenges, including the potential for job displacement and the need for workers to adapt to new skills. The rise of the gig economy has further complicated the traditional employment model, offering flexibility but also raising questions about job security and benefits. As the workplace continues to evolve, the ability to adapt to change, lifelong learning, and policy innovation will be key to navigating the future of work successfully.

Question: According to the passage, what is crucial for successfully navigating the future of work?

- A) Maintaining traditional employment models
- B) Limiting the use of artificial intelligence
- C) Focusing solely on job displacement issues
- D) Adapting to change and lifelong learning
- E) Reducing the flexibility offered by the gig economy

Answer: D) Adapting to change and lifelong learning

Explanation: The passage concludes by stressing the importance of adaptability and lifelong learning, along with policy innovation, as essential for dealing with the changes and challenges presented by the future of work. This makes option D the correct answer, as it aligns with the passage's emphasis on the need for individuals to continuously update their skills and adapt to new work environments.

5. Syllogisms

Question 1: All roses are flowers. Some flowers fade quickly. Which conclusion follows?

- A) All roses fade quickly.
- B) Some roses are not flowers.
- C) No roses fade quickly.
- D) Some roses may fade quickly.
- E) All flowers are roses.

Answer: D) Some roses may fade quickly.

Explanation: Given that all roses are a subset of flowers and some flowers fade quickly, it logically follows that some roses (being flowers) may also fade quickly. Option D is correct as it allows for the possibility without asserting it as a fact for all roses, aligning with the structure of a syllogism where specific instances are inferred from general premises. Options A, B, C, and E make absolute claims that cannot be directly concluded from the given premises.

Question 2: All electric cars are environmentally friendly. No diesel cars are environmentally friendly. Which conclusion follows?

- A) Some diesel cars are electric.
- B) No electric cars are diesel cars.
- C) All environmentally friendly cars are diesel.
- D) Some environmentally friendly cars are not electric.
- E) Electric cars and diesel cars have the same environmental impact.

Answer: B) No electric cars are diesel cars.

Explanation: Since all electric cars are environmentally friendly and no diesel cars are environmentally friendly, it logically follows that electric cars cannot be diesel cars. This conclusion directly stems from the premises that categorically separate electric cars from diesel cars based on their environmental impact.

Question 3: All students who study daily perform well in exams. Some students who do not participate in extracurricular activities study daily. Which conclusion follows?

- A) No students who participate in extracurricular activities perform well in exams.
- B) Some students who do not participate in extracurricular activities perform well in exams.
- C) All students who perform well in exams do not participate in extracurricular activities.
- D) Participation in extracurricular activities prevents students from performing well in exams.
- E) All students who study daily do not participate in extracurricular activities.

Answer: B) Some students who do not participate in extracurricular activities perform well in exams.

Explanation: Given that students who study daily perform well and that some of these diligent students are among those who do not participate in extracurricular activities, it logically follows that some students who avoid extracurricular activities indeed perform well in exams. This conclusion is supported by linking daily study habits to exam performance.

Question 4: No fast food is nutritious. All fruits are nutritious. Which conclusion follows?

- A) Some fruits are fast food.
- B) No fruits are fast food.
- C) All fast food is fruit.
- D) Some nutritious foods are not fruits.
- E) All nutritious foods are fruits.

Answer: B) No fruits are fast food.

Explanation: Since no fast food is considered nutritious and all fruits are categorized as nutritious, it logically follows that fruits cannot be classified as fast food. This conclusion stems from the mutually exclusive nature of the nutritional value assigned to fast food versus fruits.

Question 5: Some paintings are considered masterpieces. All masterpieces are displayed in museums. Which conclusion follows?

- A) No paintings are displayed in museums.
- B) Some paintings are not considered masterpieces.
- C) All paintings are displayed in museums.
- D) Some paintings displayed in museums are considered masterpieces.
- E) Masterpieces are not paintings.

Answer: D) Some paintings displayed in museums are considered masterpieces.

Explanation: Given that a subset of paintings are masterpieces and that all masterpieces find a place in museums, it logically follows that some paintings (specifically, those considered masterpieces) are displayed in museums. This conclusion connects the dots between paintings being masterpieces and the placement of masterpieces in museums.

Class 11: Statement and Assumption

Theory of "Statement and Assumption" in Logical Reasoning

The "Statement and Assumption" topic within Logical Reasoning is centered on evaluating given statements and determining which underlying assumptions are implicitly made. This area of study is fundamental for developing critical thinking skills, as it involves discerning not just what is explicitly stated but also what must be true for the statement to hold. Here, we delve into the principles, techniques, and nuances of analyzing statements and their assumptions.

a) Understanding Statements and Assumptions

- ✓ **Statement:** A declaration or assertion made about a situation, fact, or opinion. It provides information or a viewpoint presented by the speaker or writer.
- ✓ **Assumption:** An unstated premise or belief that is taken for granted and supports the validity of the statement. Assumptions are not directly expressed but are essential for the statement's rationale.

b) Identifying Implicit Assumptions

Implicit assumptions are the backbone of a statement, providing unseen support. Identifying these requires considering what must be inherently believed for the statement to be considered logical or true. This process involves:

➤ Analyzing the statement's context and content.

Inferring the unspoken premises that must exist for the statement to hold.

Distinguishing between assumptions that are directly supported by the statement and those that are speculative or external to the statement's logic.

➤ Principles for Evaluating Assumptions

- ✓ **Relevance:** The assumption must be directly related to the statement, providing necessary support.
- ✓ **Plausibility:** The assumption should be reasonable and believable within the statement's context.
- ✓ **Implicitness:** True assumptions are not explicitly stated but are required for the statement's logic to be coherent.

➤ Techniques for Analysis

Break Down the Statement: Dissect the statement into its key components and identify the claim being made.

- ✓ **Question the Statement:** Ask what beliefs or premises must be true for the statement to stand. This questioning can reveal hidden assumptions.

- ✓ **Consider Alternatives:** Assess whether alternative assumptions could also support the statement, which helps in understanding the statement's robustness.

➤ Application of Statement and Assumption Analysis

This analytical approach is widely applicable across various domains, including:

- ✓ **Critical Reading and Listening:** Understanding arguments and narratives more deeply by discerning underlying assumptions.
- ✓ **Debate and Argumentation:** Constructing stronger arguments or critiquing others' arguments by identifying and challenging assumptions.
- ✓ **Decision Making and Problem Solving:** Recognizing the implicit beliefs guiding decisions or solutions to ensure they are well-founded.

c) Conclusion

The ability to identify and evaluate assumptions implicit in statements is a critical component of logical reasoning. It enhances our capacity to think critically, argue effectively, and make informed decisions. By applying the principles and techniques of "Statement and Assumption" analysis, individuals can navigate complex information more adeptly, discerning not just what is said but also the foundational beliefs that underpin statements. This skill is invaluable in academic, professional, and everyday contexts, where clarity of thought and depth of understanding are paramount.

► Directions to Solve

In each question below is given a statement followed by two assumptions numbered I and II. You have to consider the statement and the following assumptions and decide which of the assumptions is implicit in the statement.

Give answer

- (A) If only assumption I is implicit
- (B) If only assumption II is implicit
- (C) If either I or II is implicit
- (D) If neither I nor II is implicit
- (E) If both I and II are implicit.

1. **Statement:** "You are hereby appointed as a programmer with a probation period of one year and your performance will be reviewed at the end of the period for confirmation." - A line in an appointment letter.

Assumptions:

I. The performance of an individual generally is not known at the time of appointment offer.

II. Generally an individual tries to prove his worth in the probation period.

(A) Only assumption I is implicit

(B) Only assumption II is implicit

(C) Either I or II is implicit

(D) Neither I nor II is implicit

(E) Both I and II are implicit

Answer: Option (E)

Explanation:

The performance of the individual has to be tested over a span of time as the statement mentions. So, I is implicit. The statement mentions that the individual's worth shall be reviewed (during probation period) before confirmation. So, II is also implicit.

2. **Statement:** It is desirable to put the child in school at the age of 5 or so.

Assumptions:

I. At that age the child reaches appropriate level of development and is ready to learn.

II. The schools do not admit children after six years of age.

(A) Only assumption I is implicit

(B) Only assumption II is implicit

(C) Either I or II is implicit

(D) Neither I nor II is implicit

(E) Both I and II are implicit

Answer: Option (A)

Explanation:

Since the statement talks of putting the child in school at the age of 5, it means that the child is mentally prepared for the same at this age. So, I is implicit. But nothing about admission after 6 years of age is mentioned in the statement. So, II is not implicit.

3. **Statement:** "In order to bring punctuality in our office, we must provide conveyance allowance to our employees." - In charge of a company tells Personnel Manager.

Assumptions:

I. Conveyance allowance will not help in bringing punctuality.

II. Discipline and reward should always go hand in hand.

(A) Only assumption I is implicit

(B) Only assumption II is implicit

(C) Either I or II is implicit

(D) Neither I nor II is implicit

(E) Both I and II are implicit

Answer: Option (B)

Explanation:

Assumption I goes against the statement. So, it is not implicit. The allowance will serve as a reward to the employees and shall provoke them to come on time. So, II is implicit.

4. **Statement:** Unemployment allowance should be given to all unemployed Indian youth above 18 years of age.

Assumptions:

I. There are unemployed youth in India who needs monetary support.

II. The government has sufficient funds to provide allowance to all unemployed youth.

(A) Only assumption I is implicit

(B) Only assumption II is implicit

(C) Either I or II is implicit

(D) Neither I nor II is implicit

(E) Both I and II are implicit

Answer: Option (A)

Explanation:

I directly follows from the statement and so is implicit. Also, the statement is a suggestion and does not tell about a government policy or its position of funds. So, II is not implicit.

5. **Statement:** "If you trouble me, I will slap you." - A mother warns her child.

Assumptions:

- I. With the warning, the child may stop troubling her.
- II. All children are basically naughty.

(A) Only assumption I is implicit

(B) Only assumption II is implicit

(C) Either I or II is implicit

(D) Neither I nor II is implicit

(E) Both I and II are implicit

Answer: Option **(A)**

Explanation:

The mother warns her child with the expectation that he would stop troubling her. So, I is implicit. The general nature of children cannot be derived from the statement. So, II is not implicit.

1. **Statement:** Many historians have done more harm than good by distorting truth.

Assumptions:

- I. People believe what is reported by the historians.
- II. Historians are seldom expected to depict the truth.

(A) Only assumption I is implicit

(B) Only assumption II is implicit

(C) Either I or II is implicit

(D) Neither I nor II is implicit

(E) Both I and II are implicit

Answer: Option **(A)**

Explanation:

The fact that historians have done harm by distorting truth, means that people believe what is reported by the historians. So, I is implicit. II does not follow from the statement and so is not implicit.

Statement: "As there is a great demand, every person seeking tickets of the programme will be given only five tickets."

Assumptions:

- I. The organizers are not keen on selling the tickets.
- II. No one is interested in getting more than five tickets.

(A) Only assumption I is implicit

(B) Only assumption II is implicit

(C) Either I or II is implicit

(D) Neither I nor II is implicit

(E) Both I and II are implicit

Answer: Option (D)

Explanation:

Clearly, the organisers are adopting this policy not to reduce the sale but to cope up with great demand so that everyone can get the ticket. So, I is not implicit. Also, due to great demand, the maximum number of tickets one person can get has been reduced to five. So, II is also not implicit.

Statement: "Computer education should start at schools itself."

Assumptions:

- I. Learning computers is easy.
- II. Computer education fetches jobs easily.

(A) Only assumption I is implicit

(B) Only assumption II is implicit

(C) Either I or II is implicit

(D) Neither I nor II is implicit

(E) Both I and II are implicit

Answer: Option (A)

Explanation:

Clearly, computer education can be started at the school level only if it is easy. So, I is implicit. In the statement, nothing is mentioned about the link between jobs and computer education. So, II is not implicit.

Statement: If he is intelligent, he will pass the examination.

Assumptions:

- I. To pass, he must be intelligent.
- II. He will pass the examination.

- (A) Only assumption I is implicit
- (B) Only assumption II is implicit
- (C) Either I or II is implicit
- (D) Neither I nor II is implicit
- (E) Both I and II are implicit

Answer: Option (A)

Explanation:

The statement mentions that he will pass if he is intelligent. So, I is implicit. Further, this means that it is not necessary that he will pass. So, II is not implicit.

Statement: Today I must satisfy myself only by looking at a pink headed duck in an encyclopaedia.

Assumptions:

- I. Pink headed ducks are as good as extinct now.
- II. People refer to encyclopaedia to know only about things which do not exist now.

- (A) Only assumption I is implicit
- (B) Only assumption II is implicit
- (C) Either I or II is implicit
- (D) Neither I nor II is implicit
- (E) Both I and II are implicit

Answer: Option (A)

Explanation:

Since the narrator talks of satisfying himself by just looking at a picture in encyclopaedia, it means that pink headed ducks are not to be seen alive. So, I is implicit. But II does not follow from the statement and is not implicit.

Statement: "To keep myself up-to-date, I always listen to 9.00 p.m. news on radio." - A candidate tells the interview board.

Assumptions:

- I. The candidate does not read newspaper.
- II. Recent news is broadcast only on radio.

(A) Only assumption I is implicit

(B) Only assumption II is implicit

(C) Either I or II is implicit

(D) Neither I nor II is implicit

(E) Both I and II are implicit

Answer: Option (D)

Explanation:

The candidate listens to news on the radio does not mean that he does not read newspaper or that radio is the only source of recent news. So, neither I nor II is implicit.

Statement: The entire north India, including Delhi and the neighbouring states remained 'powerless' the whole day of 19th December as the northern grid supplying electricity to the seven states collapsed yet again.

Assumptions:

- I. The northern grid had collapsed earlier.
- II. The grid system of providing electricity to a group of states is an ineffective type of power supply system.

(A) Only assumption I is implicit

(B) Only assumption II is implicit

(C) Either I or II is implicit

(D) Neither I nor II is implicit

(E) Both I and II are implicit

Answer: Option (A)

Explanation:

The statement mentions that the northern grid collapsed 'yet again'. This means that it had collapsed earlier also. So, I is implicit. Also, the statement talks of a particular fault in the system but does not condemn the grid system. So, II is not implicit.

Statement: Believe me, I have read it in newspaper X.

Assumptions:

- I. Newspaper X gives reliable information/news.
- II. I am reporting exactly as it is given in newspaper X.

- (A) Only assumption I is implicit
- (B) Only assumption II is implicit
- (C) Either I or II is implicit
- (D) Neither I nor II is implicit
- (E) Both I and II are implicit

Answer: Option (B)

Explanation:

The narrator in the statement clearly insists on the reliability of the fact that what he said, he had read it in newspaper X, and not on the truth of what he said. So, only II is implicit

Statement: Many people have expressed surprise as the princess has broken the royal tradition of marriage by choosing a commoner as her life partner.

Assumptions:

- I. People expect royal families to observe customs and traditions.
- II. People still value 'purity of royal blood' and 'status' when it comes to a marriage of members of royal family.

- (A) Only assumption I is implicit
- (B) Only assumption II is implicit
- (C) Either I or II is implicit
- (D) Neither I nor II is implicit
- (E) Both I and II are implicit

Answer: Option (E)

Explanation:

Since the princess' step has been taken by surprise, it is evident that she was not expected to marry a commoner but a person of equivalent 'status*. So, both I and II are implicit.

Statement: Highly brilliant and industrious students do not always excel in the written examination.

Assumptions:

- I. The written examination is good mainly for mediocre students.
- II. The brilliant and industrious students cannot always write good answers in the exam

- (A) Only assumption I is implicit
- (B) Only assumption II is implicit
- (C) Either I or II is implicit
- (D) Neither I nor II is implicit
- (E) Both I and II are implicit

Answer: Option (B)

Explanation:

II explains the fact given in the statement and so is implicit. Nothing about 'mediocre students' is mentioned in or can be deduced from the given statement. So, I is not implicit.

Statement: Sachin's mother instructed him to return home by train if it rains heavily.

Assumptions:

- I. Sachin may not be able to decide himself if it rains heavily.
- II. The trains may ply even if it rains heavily.

- (A) Only assumption I is implicit
- (B) Only assumption II is implicit
- (C) Either I or II is implicit
- (D) Neither I nor II is implicit
- (E) Both I and II are implicit

Answer: Option (B)

Explanation:

Sachin's mother has instructed him as a matter of caution and out of care for her child, and not because Sachin himself would not be able to decide. So, I is not implicit. Besides, Sachin's mother instructs him to take to train journey in case it rains heavily. So, II is implicit.

Statement: "Please put more people on the job to make up for the delay."

Assumptions:

- I. Delay is inevitable in most jobs.
- II. Output will increase with more number of people on the job.

- (A) Only assumption I is implicit
- (B) Only assumption II is implicit
- (C) Either I or II is implicit
- (D) Neither I nor II is implicit
- (E) Both I and II are implicit

Answer: Option (B)

Explanation:

The advice tells to 'make up for the delay' showing that delay is not to be done. So, I is not implicit. Since increase in number of people will make up for the delay, it means the output will increase with this increase in number. So, II is implicit.

Statement: In spite of less than normal rainfall in the catchment areas during the first two months of monsoon of the lakes supplying water to the city the authority has not yet affected any cut in the water supply to the city.

Assumptions:

- I. The rainfall during the remaining part of the monsoon may be adequate for normal water supply.
- II. The present water level of the lakes supplying water to the city may be adequate for normal supply.

- (A) Only assumption I is implicit
- (B) Only assumption II is implicit
- (C) Either I or II is implicit
- (D) Neither I nor II is implicit
- (E) Both I and II are implicit

Answer: Option (E)

Explanation:

The statement clearly indicates that at present the water level of the lakes is adequate. There is nothing of a shortage to induce a cut in water supply and still there is time to wait and watch the performance of rains during the remaining monsoon period. So, both I and II are implicit.

Statement: If you are an engineer, we have a challenging job for you.

Assumptions:

I. We need an engineer.

II. You are an engineer.

(A) Only assumption I is implicit

(B) Only assumption II is implicit

(C) Either I or II is implicit

(D) Neither I nor II is implicit

(E) Both I and II are implicit

Answer: Option (A)

Explanation:

Clearly, job is offered to an engineer. This means that he is needed. So, I is implicit. The word 'If' in the statement makes II not implicit.

Statement: In spite of poor services, the commutators have not complained against it.

Assumptions:

I. Generally people do not tolerate poor services.

II. Complaints sometimes improve services.

(A) Only assumption I is implicit

(B) Only assumption II is implicit

(C) Either I or II is implicit

(D) Neither I nor II is implicit

(E) Both I and II are implicit

Answer: Option (A)

Explanation:

The statement expresses an expectation of complaints from the people against poor services. So, I is implicit. But the effect of complaints cannot be deduced. So, II is not implicit.

 **Directions to Solve**

In each question below is given a statement followed by three assumptions numbered I, II and III. You have to consider the statement and the following assumptions, decide which of the assumptions is implicit in the statement and choose your answer accordingly.

1. **Statement:** "Wanted a two bedroom flat in the court area for immediate possession." - An advertisement.

Assumptions:

- I. Flats are available in court area.
- II. Some people will respond to the advertisement.
- III. It is a practice to give such an advertisement.

- (A) All are implicit
- (B) Only II is implicit
- (C) None is implicit
- (D) Only I and II are implicit
- (E) None of these

Answer: Option (B)

Explanation:

The advertisement depicts only the requirement, not the availability of flats in court area. So, I is not implicit. Such advertisements are given with the expectation of a response which can make such a flat available. So, II is implicit. Assumption III does not follow from the statement and so is not implicit.

Statement: This book is so prepared that even a layman can study science in the absence of a teacher.

Assumptions:

- I. A layman wishes to study science without a teacher.
- II. A teacher may not always be available to teach science.
- III. A layman generally finds it difficult to learn science on its own.

- (A) Only I and II are implicit
- (B) Only II and III are implicit
- (C) Only I and III are implicit
- (D) All are implicit
- (E) None of these

Answer: Option (B)

Explanation:

Clearly, the statement is made to impress the usefulness of the book. It does not mention the desire of a layman. So, I is not implicit. Also, the book is intended to guide one when a teacher is not available. So, both II and III are implicit.

Statement: "We do not want you to see our product on newspaper, visit our shop to get a full view." - An advertisement.

Assumptions:

- I. People generally decide to purchase any product after seeing the name in the advertisement.
- II. Uncommon appeal may attract the customers.
- III. People may come to see the product.

- (A) None is implicit
- (B) Only I and II are implicit
- (C) Only II and III are implicit
- (D) All are implicit
- (E) None of these

Answer: Option (C)

Explanation:

It can be inferred from the statement that people also like to see a product before buying. So, I is not implicit. Also, the statement is just an attempt to arouse the people to come and see the shop. So, both II and III are implicit.

Statement: There is big boom in drug business and a number of jhuggi-jhopari dwellers in Delhi can be seen pedalling with small pouches of smack and brown sugar.

Assumptions:

- I. Drug addiction is increasing in the country, specially in the capital.
- II. All the big dons involved in the smuggling of drugs live in jhuggi-jhopari areas.
- III. Most of the jhuggi-jhopari dwellers would do anything for money.

- (A) Only I is implicit
- (B) Only II is implicit
- (C) Only III is implicit
- (D) Only I and III are implicit
- (E) Either I or III is implicit

Answer: Option (D)

Explanation:

The statement talks of boom in drug business and cites examples from the capital city. This makes I implicit. Further, it is given that most jhuggi-jhopari dwellers are seen to indulge in transactions of drug pouches. This implies that they give in to their lust for money quite easily and do not hesitate to get involved in illegal activities for the same. So, III is implicit while II is not.

Statement: "X-chocolate is ideal as a gift for someone you love." - An advertisement.

Assumptions:

- I. People generally give gifts to loved ones.
- II. Such advertisements generally influence people.
- III. Chocolate can be considered as a gift item.

- (A) Only I and II are implicit
- (B) Only II and III are implicit
- (C) Only I and III are implicit
- (D) All are implicit
- (E) None of these

Answer: Option (D)

Explanation:

Clearly, all the three directly follow from the given statement.

Statement: In order to reduce the gap between income and expenditure, the company has decided to increase the price of its product from next month.

Assumptions:

- I. The rate will remain more or less same after the increase.
- II. The expenditure will more or less remain the same in near future.
- III. The rival companies will also increase the price of the similar product.

- (A) Only I and II are implicit
- (B) Only II and III are implicit
- (C) Only III is implicit
- (D) All are implicit
- (E) None of these

Answer: Option (E)

Explanation:

Clearly, the company intends to reduce the gap between income and expenditure by increasing the price of its product i.e. by keeping the expenditure unaltered and increasing the income only. So, II is implicit while I is not. However, the rival companies may or may not follow the same pursuit. So, III is not implicit.

Statement: 'Several labour and industrial courts in this State have no proper premises. Vacancies of judges and stenos are kept pending.' - A statement of a retired judge of State X.

Assumptions:

- I. Adequate number of staff and judges helps in the smooth functioning of the industrial and labour courts.
- II. The State is not bothered about the condition of the labour and industrial courts.
- III. Physical facilities of an office help in increasing efficiency of its employees.

- (A) Only I and III are implicit
- (B) Only II is implicit
- (C) Only II and III are implicit
- (D) All I, II and III are implicit
- (E) None of these

Answer: Option (D)

Explanation:

The statement expresses grave concern over the lack of proper premises and inadequate staff in labour and industrial courts. This implies that adequate staff is a must to serve the purpose of these courts and a proper office only can ensure their smooth functioning. So, both I and III are implicit. The lack of facilities to the courts also indicates the state's negligent attitude to the condition of the courts. So, II is also implicit.

Statement: "A rare opportunity to be a professional while you are at home." - An advertisement for computer literate housewives by a computer company.

Assumptions:

- I. Some housewives simultaneously desire to become professional.
- II. Computer industry is growing at a fast pace.
- III. It is possible to be a professional as well as a housewife.

- (A) Only I and II are implicit
- (B) Only II and III are implicit
- (C) Only I and III are implicit
- (D) Only II is implicit
- (E) None of these

Answer: Option (C)

Explanation:

Clearly, a company would highlight only that feature in its advertisement which people crave for and which it can make possible. So, both I and III are implicit. Nothing can be deduced about the growth of computer industry. So, II is not implicit.

Statement: Pramod decided to get the railway reservation in May, for the journey he wants to make in July, to Madras.

Assumptions:

- I. The railways issues reservations two months in advance.
- II. There are more than one trains to Madras.
- III. There will be vacancy in the desired class.

- (A) Only I is implicit
- (B) Only II and III are implicit
- (C) Only I and III are implicit
- (D) All are implicit
- (E) None of these

Answer: Option (A)

Explanation:

Clearly, since Pramod decides to get the reservation in May for the journey in July, so I is implicit. The number of trains to Madras or the position of vacancies in different classes cannot be deduced from the given statement. So, neither II nor III is implicit.

Statement: "To make the company commercially viable, there is an urgent need to prune the staff strength and borrow money from the financial institutions." - Opinion of a consultant.

Assumptions:

- I. The financial institutions lend money for such proposals.
- II. The product of the company has a potential market.
- III. The employees of the company are inefficient.

- (A) None is implicit
- (B) All are implicit
- (C) Only I and II are implicit
- (D) Only II and III are implicit
- (E) Only I and III are implicit

Answer: Option (C)

Explanation:

Since the consultant talks of borrowing money from financial institutions, so I is implicit. That the owners wish to make the company 'commercially viable' makes II implicit. Also, it is mentioned that staff strength is to be reduced to make the company 'commercially viable'. So, III is not implicit.

Class 12: Course of Action

The "Course of Action" in logical reasoning is a critical component that tests the decision-making ability of individuals based on a given set of conditions or scenarios. A course of action is essentially a step or administrative decision taken to address a problem or situation described in a statement. When evaluating potential courses of action, the responder must assume all information in the statement to be accurate and then apply logic to determine the most appropriate steps to take. This requires not only a clear understanding of the situation but also an ability to predict outcomes based on the actions considered.

a) Key Concepts in Course of Action:

- ✓ **Problem Identification:** The first step is to accurately understand the problem or situation presented in the statement. This involves identifying the key issues and the stakeholders involved.
- ✓ **Logical and Feasible Actions:** Courses of action should be logical, meaning they should directly address the issues identified in a manner that is sensible and based on sound reasoning. They should also be feasible, or practically achievable, given the scenario's constraints.
- ✓ **Effectiveness:** An appropriate course of action should be effective in solving the problem or improving the situation. This involves considering the short-term and long-term implications of the action.
- ✓ **Ethical Considerations:** The proposed action should be ethically sound, not leading to morally questionable outcomes or harming any stakeholders unjustly.
- ✓ **Assumption-Based Reasoning:** It is crucial to assume that all information provided in the statement is true and complete. The reasoning should not rely on outside information or assumptions not supported by the statement.

b) Decision Criteria for Courses of Action:

- ✓ **Relevance:** The action directly addresses the problem or situation at hand.
- ✓ **Practicality:** The action can be realistically implemented with the available resources and within the given constraints.
- ✓ **Beneficial Outcome:** The action is likely to lead to a positive outcome, mitigating the problem or capitalizing on the opportunity presented in the statement.

c) Evaluating Courses of Action:

- ✓ **Direct Approach:** If the action directly tackles the root cause of the problem.
- ✓ **Indirect Approach:** If the action addresses secondary issues that contribute to the main problem, potentially leading to a longer-term solution.

✓ **Decision Making:** After evaluating the potential courses of action based on the criteria above, the decision on which course(s) of action to follow involves:

- ✓ **Choosing the Most Effective:** Selecting the action or actions that most effectively address the problem.
- ✓ **Combining Actions:** Sometimes, a combination of actions may be necessary to fully address the situation.
- ✓ **Rejecting Ineffective Actions:** Identifying and discarding actions that are not relevant, practical, or beneficial.

The "Course of Action" exercises in logical reasoning tests the ability to think critically and make decisions that are logical, ethical, and effective in addressing the presented problems. It is a measure of practical reasoning and problem-solving skills in real-world scenarios.

► Directions to Solve

In each question below is given a statement followed by two courses of action numbered I and II. You have to assume everything in the statement to be true and on the basis of the information given in the statement, decide which of the suggested courses of action logically follow(s) for pursuing.

Give answer

- (A) If only I follows
- (B) If only II follows
- (C) If either I or II follows
- (D) If neither I nor II follows
- (E) If both I and II follow.

Type-1

1. **Statement:** A large number of people in ward X of the city are diagnosed to be suffering from a fatal malaria type.

Courses of Action:

- I. The city municipal authority should take immediate steps to carry out extensive fumigation in ward X.
- II. The people in the area should be advised to take steps to avoid mosquito bites.

- (A) Only I follows
- (B) Only II follows
- (C) Either I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

Answer: Option (E)

Explanation:

Clearly, prevention from mosquitoes and elimination of mosquitoes are two ways to prevent malaria. So, both the courses follow.

2. **Statement:** Severe drought is reported to have set in several parts of the country.

Courses of Action:

- I. Government should immediately make arrangement for providing financial assistance to those affected.
- II. Food, water and fodder should immediately be sent to all these areas to save the people and cattle.

- (A) Only I follows
- (B) Only II follows
- (C) Either I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

Answer: Option (B)

Explanation:

In the break-out of a natural calamity, the basic duty of the government becomes to provide the basic amenities essential to save the lives of people and cattle. Providing financial assistance to all would put undue burden on the country's resources. So, only II follows.

3. **Statement:** Since its launching in 1981, Vayudoot has so far accumulated losses amounting to Rs 153 crore.

Courses of Action:

- I. Vayudoot should be directed to reduce wasteful expenditure and to increase passenger fare.
- II. An amount of about Rs 300 crore should be provided to Vayudoot to make the airliner economically viable.

- (A) Only I follows
- (B) Only II follows
- (C) Either I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

Answer: Option (A)

Explanation:

Clearly, for better economic gain, losses should be reduced and income increased. So, only course I follows.

4. **Statement:** Exporters in the capital are alleging that commercial banks are violating a Reserve Bank of India directive to operate a post shipment export credit denominated in foreign currency at international rates from January this year.

Courses of Action:

- I. The officers concerned in the commercial banks are to be suspended.
- II. The RBI should be asked to stop giving such directives to commercial banks.

- (A) Only I follows
- (B) Only II follows
- (C) Either I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

Answer: Option (D)

Explanation:

The statement mentions that the commercial banks violate a directive issued by the RBI. The remedy is only to make the banks implement the Act. So, none of the courses follows.

5. **Statement:** A large number of people die every year due to drinking polluted water during the summer.

Courses of Action:

- I. The government should make adequate arrangements to provide safe drinking water to all its citizens.
- II. The people should be educated about the dangers of drinking polluted water.

- (A) Only I follows
- (B) Only II follows
- (C) Either I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

Answer: Option (E)

Explanation:

The situation demands creating awareness among people about the dangers of drinking polluted water so that they themselves refrain from the same, and at the same time taking steps to provide safe drinking water. So, both the courses follow.

6. **Statement:** Most of those who study in premier engineering colleges in India migrate to developed nations for better prospects in their professional pursuits.

Courses of Action:

- I. All the students joining these colleges should be asked to sign a bond at the time of admission to the effect that they will remain in India at least for ten years after they complete education.
- II. All those students who desire to settle in the developed nations should be asked to pay entire cost of their education which the government subsidises.

- (A) Only I follows
- (B) Only II follows
- (C) Either I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

Answer: Option (B)

Explanation:

Clearly, no student can be bound to live and work in the country against his wish. So, I does not follow. However, it is quite right to recover the extra benefits awarded to students if they do not serve their own country. So, II follows.

7. **Statement:** There is an unprecedented increase in migration of villagers to urban areas as repeated crop failure has put them into precarious financial situation.

Courses of Action:

- I. The villagers should be provided with alternate source of income in their villages which will make them stay put.
- II. The migrated villagers should be provided with jobs in the urban areas to help them survive.

(A) Only I follows

(B) Only II follows

(C) Either I or II follows

(D) Neither I nor II follows

(E) Both I and II follow

Answer: Option (A)

Explanation:

Clearly, increased migration would add to the burden on city's infrastructure. So, attempts should be made to make the villagers feel comfortable in the villages itself. So, only course I follows.

8. **Statement:** As stated in the recent census report the female to male ratio is alarmingly low.

Courses of Action:

- I. The government should conduct another census to verify the results.
- II. The government should immediately issue orders to all the departments to encourage people to improve the ratio.

(A) Only I follows

(B) Only II follows

(C) Either I or II follows

(D) Neither I nor II follows

(E) Both I and II follow

Answer: Option (B)

Explanation:

A census is always conducted with the utmost precision, leaving chances of only negligible differences. So, I does not follow. Further, the ratio can be improved by creating awareness among the masses and abolishing female foeticide. Thus, only course II follows.

9. **Statement:** Four districts in State A have been experiencing severe drought for the last three years resulting into exodus of people from these districts.

Courses of Action:

- I. The government should immediately start food for work programme in the district to put a halt to the exodus.
- II. The government should make sincere efforts to provide drinking/potable water to these districts

- (A) Only I follows
- (B) Only II follows
- (C) Either I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

Answer: Option (E)

Explanation:

The exodus can be stopped by providing the people conditions conducive to living. So, both the courses follow.

10. **Statement:** If the retired Professors of the same Institutes are also invited to deliberate on restructuring of the organisation, their contribution may be beneficial to the Institute.

Courses of Action:

- I. Management may seek opinion of the employees before calling retired professors.
- II. Management should involve experienced people for the systematic restructuring of the organisation.

- (A) Only I follows
- (B) Only II follows
- (C) Either I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

Answer: Option (B)

Explanation:

Clearly, the statement stresses that the contribution of retired Professors shall be beneficial. This means that these people's experience regarding working of the organisation is helpful. So, only course II follows.

Type-2

1. **Statement:** The Secretary lamented that the electronic media was losing its credibility and that it should try to regain it by establishing better communications with the listeners and the viewers. He also emphasised the need for training to improve the functioning.

Courses of Action:

- I. Efforts should be made to get organised feed back on the programme.
- II. The critical areas in which the staff requires training should be identified.

- (A) Only I follows
- (B) Only II follows
- (C) Either I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

Answer: Option (E)

Explanation:

Clearly, both the courses directly follow from the pre-requisites mentioned in the statement.

2. **Statement:** Courts take too long in deciding important disputes of various departments.

Courses of Action:

- I. Courts should be ordered to speed up matters.
- II. Special powers should be granted to officers to settle disputes concerning their department.

- (A) Only I follows
- (B) Only II follows
- (C) Either I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

Answer: Option (E)

Explanation:

Clearly, either the work in the court needs to be speeded up or the system be reorganised so that more number of problems can be resolved at the lower levels itself, to provide speedy justice to the people. So, both the courses follow.

3. **Statement:** Certain mining industries in Gujarat may come to a standstill because of the notification issued by the Department of Environment and Forest banning mining operations and industries alike within 25 kms of National Park, the game sanctuary and reserve forest areas.

Courses of Action:

- I. The Department should be asked to immediately withdraw the notification.
- II. The Government should make effort to shift the parks, sanctuaries and reserve forests to other non-mining areas.

- (A) Only I follows
- (B) Only II follows
- (C) Either I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

Answer: Option (D)

Explanation:

Clearly, none of the courses of action follows because firstly, the notification is issued to protect the natural environment and so cannot be withdrawn and secondly, the sanctuaries etc. cannot be shifted.

4. **Statement:** There have been many instances of derailment of trains due to landslide in the hilly areas which caused loss of many lives.

Courses of Action:

- I. The railway authority should arrange to deploy pilot engines before the movement of passenger trains in the hilly areas to alert the trains in case of any landslide.
- II. The railway authority should strengthen the hill slopes by putting iron meshes so that the loose boulders do not fall on the track.

- (A) Only I follows
- (B) Only II follows
- (C) Either I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

Answer: Option (C)

Explanation:

Clearly, either something should be done to alert the trains well in advance in case of a landslide or some means should be adopted to prevent blockage of tracks during landslides. Thus, either I or II follows.

5. **Statement:** India today is midstream in its demographic transition. In the last 60 years there has been an almost continuous decline in mortality; while fertility has declined over the last 20 years. The consequence is that there has been a rapid growth in population over the last 50 years.

Courses of Action:

- I. India should immediately revitalise its family planning programme.
- II. The Government should immediately launch a massive education programme through mass media highlighting the implication of population growth at the present rate.

- (A) Only I follows
- (B) Only II follows
- (C) Either I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

Answer: Option (E)

Explanation:

Clearly, to face the problem of the ever-growing population, an effective family planning programme, for the people to have small families, is a must. Education shall further stress the advantages of having lesser number of children and the disasters of the fast growth in population. Thus, both the courses follow.

6. **Statement:** Footpaths of a busy road are crowded with vendors selling cheap items.

Courses of Action:

- I. The help of police should be sought to drive them away.
- II. Some space should be provided to them where they can earn their bread without blocking footpaths.

- (A) Only I follows
- (B) Only II follows
- (C) Either I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

Answer: Option (E)

Explanation:

Crowding on footpaths is a great inconvenience for walkers. So, stern action needs to be taken to remove the vendors. But at the same time these people ought to be provided alternative means of livelihood. So, both the courses follow.

7. **Statement:** Some serious blunders were detected in the Accounts section of a factory.

Courses of Action:

- I. An efficient team of auditors should be appointed to check the Accounts.
- II. A show cause notice should be issued to all the employees involved in the irregularity.

- (A) Only I follows
- (B) Only II follows
- (C) Either I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

Answer: Option (E)

Explanation:

Clearly, the situation demands that the faults in Accounts be properly worked out and the persons involved be interrogated about the matter. So, both the courses follow.

8. **Statement:** Researchers are feeling agitated as libraries are not equipped to provide the right information to the right users at the right time in the required format. Even the users are not aware about the various services available for them.

Courses of Action:

- I. All the information available to the libraries should be computerised to provide faster services to the users.
- II. Library staff should be trained in computer operations.

- (A) Only I follows
- (B) Only II follows
- (C) Either I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

Answer: Option (E)

Explanation:

Clearly, the library needs to be provided with the essential facilities and trained personnel for better services. So, both the courses follow.

9. **Statement:** Many medical and engineering graduates are taking up jobs in administrative services and in banks.

Courses of Action:

- I. All the professionals should be advised to refrain from taking up such jobs.
- II. The government should appoint a committee to find out the reasons for these professionals taking up such jobs and to suggest remedial measures.

(A) Only I follows

(B) Only II follows

(C) Either I or II follows

(D) Neither I nor II follows

(E) Both I and II follow

Answer: Option (B)

Explanation:

Following course I would be an infringement of the right to freedom of individuals. However, if the lacking of their respective fields are found out and removed, the professionals would surely give up the idea of opting for other jobs. Hence, only course II follows.

10. **Statement:** Due to substantial reduction in fares by different airline services, large number of passengers so far travelling by upper classes in trains have switched over to airline services.

Courses of Action:

- I. The railways should immediately reduce the fare structure of the upper classes substantially to retain its passengers.
- II. The railways should reduce the capacity of upper classes in all the trains to avoid loss.

(A) Only I follows

(B) Only II follows

(C) Either I or II follows

(D) Neither I nor II follows

(E) Both I and II follow

Answer: Option (A)

Explanation:

Airlines, being convenient and faster means of transport, people would surely prefer it to the railways if there is a marginal difference between the fares. Hence, a considerable gap between the two fares is a must for the railways. So, course I follows. Following course II would reduce the volume of passengers. Hence, II does not follow.

Type-3

1. **Statement:** The weather bureau has through a recent bulletin forecast heavy rainfall during the next week which may cause water logging in several parts of the city.

Courses of Action:

- I. The bulletin should be given wide publicity through the mass media.
- II. The civic authority should keep in readiness the pumping system for removal of water from these parts.
- III. The people should be advised to stay indoors during the period.

- (A) None follows
- (B) Only I and II follow
- (C) Only II follows
- (D) Only II and III follow
- (E) None of these

Answer: Option (D)

Explanation:

The issue is not so big as to be made public extensively. So, I does not follow. Besides, the authorities must be prepared to deal with the problem effectively and persuade the people to stay indoors to avoid inconvenience arising out of water-logging. Thus, both II and III follow.

2. **Statement:** A train derailed near a station while moving over a bridge and fell into a river, resulting in the death of 65 people.

Courses of Action:

- I. The Railway Authorities should clarify the reason of the accident to the Government.
- II. The Government should allocate funds to compensate the destruction caused.
- III. The protection walls of the bridge should be made strong enough to avoid such accidents.

- (A) Only I and II follow
- (B) Only II and III follow
- (C) Only III follows
- (D) All follow
- (E) None of these

Answer: Option (C)

Explanation:

What is necessary is the preventive measures to protect the passengers, steps to avoid re-occurrence of such events and pay the sufferers adequate compensation. So, only course III follows.

3. **Statement:** Poverty is increasing because the people, who are deciding how to tackle it, know absolutely nothing about the poor.

Courses of Action:

- I. The decision makers should go to the grass root levels.
- II. The decision makers should come from the poorer sections of the society.
- III. A new set of decision makers should replace the existing one.

(A) Only I follows

(B) Only II follows

(C) Only either I or III follows

(D) All follow

Answer: Option (A)

Explanation:

The statement indirectly asserts that the decision makers can work effectively to eliminate poverty, only if they get to know the basic problems afflicting the poor people through interaction with them. So, only I follows.

4. **Statement:** Besides looks and appearances, it is also important to develop oneself from within.

Courses of Action:

- I. One should not pay attention to fashion.
- II. One should pay attention to fashion.
- III. Books on self-development should be encouraged.

(A) Only I follows

(B) Only II follows

(C) Only III follows

(D) Only I and III follow

Answer: Option (C)

Explanation:

The statement stresses the need for all-round personality development of an individual. So, only III follows.

5. **Statement:** There is an unprecedented increase in the production of wheat this kharif season in most parts of the country.

Courses of Action:

- I. The government should immediately lower down the procurement price of wheat.
- II. The farmers should be asked to store the excess produce with themselves to be used for future.
- III. The government should make its best efforts to export wheat to augment its presence in international market.

(A) Only I and II follow

(B) Only II and III follow

(C) Only I and III follow

(D) All follow

(E) None of these

Answer: Option (E)

Explanation:

Clearly, both steps I and II are not commercially viable for the farmers. So, none of them follows. The only solution lies in the government attempting to export the excess produce of wheat. Thus, only III follows.

6. **Statement:** A large number of students are reported to be dropping out of school in villages as their parents want their children to help them in farms.

Courses of Action:

- I. The government should immediately launch a programme to create awareness among the farmers about the value of education.
- II. The government should offer incentives to those farmers whose children remain in schools.
- III. Education should be made compulsory for all children up to the age of 14 and their employment banned.

(A) Only I and II follow

(B) Only II and III follow

(C) Only I and III follow

(D) All follow

(E) None of these

Answer: Option (D)

Explanation:

Literacy at basic level is the utmost need to prepare good future citizens. So, all children need to be educated. This can be achieved by creating awareness, providing incentives, enforcing education and banning employment of children. Thus, all the three courses follow.

7. **Statement:** Without the active cooperation between the proprietor and the employees of the mill, it cannot remain a profitable concern for long.

Courses of Action:

- I. The mill should be closed down.
- II. The workers should be asked to cooperate with the owners.
- III. The owners should be asked to cooperate with the employees.

(A) None follows

(B) Only I and II follow

(C) All follow

(D) Only II and III follow

(E) None of these

Answer: Option (D)

Explanation:

Clearly, both II and III directly fulfil the essence of the given statement and so, both follow.

8. **Statement:** The air and rail services have been severely disrupted due to thick fog in the northern part of the country.

Courses of Action:

- I. The rail and air services should be temporarily suspended in the region.
- II. People should be advised to make their travel plan keeping in mind the probable disruption resulting in delay or cancellation of services.
- III. The government should immediately install modern machines which will enable it to guide the rail and air services even if the thick fog develops.

(A) Only II follows

(B) Only III follows

(C) Only II and III follow

(D) All follow

(E) None of these

Answer: Option (D)

Explanation:

Keeping in mind the safety and convenience of passengers, both I and II follow. III clearly suggests a remedy to the problem and hence it also follows.

9. **Statement:** There are more than 200 villages in the hill area of Uttar Pradesh which are severely damaged due to cyclone and it causes an extra burden of Rs 200 crore on State Government for relief and rehabilitation work.

Courses of Action:

- I. People of hill area should be shifted to other safer places.
- II. State Government should ask more financial support from Central Government.
- III. Government should levy relief tax to the corporate sector to ease the additional burden.

- (A) None follows
- (B) Only I and II follow
- (C) Only II and III follow
- (D) Only I and III follow
- (E) None of these

Answer: Option (E)

Explanation:

Since severe damage has been caused by cyclone, people in affected villages ought to be shifted to safer places. Also, since relief work entails huge amounts, the State Government needs to pool up funds by either of the ways given in II and III. So, I and either II or III follow.

10. **Statement:** Any further increase in the pollution level in the city by way of industrial effluents and automobile exhaustions would pose a severe threat to the inhabitants.

Courses of Action:

- I. All the factories in the city should immediately be closed down.
- II. The automobiles should not be allowed to ply on the road for more than four hours a day.
- III. The Government should restrict the issue of fresh licences to factories and automobiles.

- (A) None follows
- (B) Only II follows
- (C) Only III follows
- (D) All follows
- (E) None of these

Answer: Option (C)

Explanation:

The existing industrial units and automobiles ought to be checked for pollution level and fitted with proper equipments to minimise the same. Restricting their operation is no solution. So, neither I nor II follows. Besides, fresh licences ought to be given only to those vehicles or factories which operate at the optimum emission level. So, III follows.

Class 13: Cause and Effect

The concept of "Cause and Effect" is a critical aspect of logical reasoning, which involves analyzing situations to identify relationships between events. Specifically, it revolves around understanding how and why things happen, leading to the identification of causes (why things happen) and effects (what happens as a result). This analysis is essential in various fields such as science, history, economics, and daily problem-solving scenarios.

a) Understanding Cause and Effect

- ✓ **Cause:** This refers to an event or action that makes something else happen. It can be thought of as the reason behind an occurrence.
- ✓ **Effect:** This is the outcome or result that directly follows from an action or condition. It is what happens as a consequence of the cause.

b) Identifying Relationships

In logical reasoning, the relationship between cause and effect can manifest in several ways:

- ✓ **Direct Cause and Effect:** When one event directly leads to the outcome of another, there is a straightforward cause-and-effect relationship.
- ✓ **Independent Causes:** Sometimes, two events may occur independently of each other, without any direct causal relationship.
- ✓ **Common Cause:** At times, two or more effects may stem from the same cause, illustrating a scenario where a single event leads to multiple outcomes.
- ✓ **Independent Effects:** This occurs when two or more effects, though seemingly related, actually originate from different causes.

c) Analytical Approaches

To analyze cause-and-effect relationships, one must:

- ✓ **Observe Patterns:** Look for consistent relationships where certain events always lead to specific outcomes.
- ✓ **Analyze Timing:** Determine if the cause precedes the effect, as this temporal relationship is crucial for establishing causality.
- ✓ **Eliminate Alternatives:** Consider other possible causes to ensure that the identified cause is indeed responsible for the effect.

d) Application in Logical Reasoning

In logical reasoning tests or scenarios, identifying cause and effect involves reading statements or scenarios to determine their relationship. The options typically provided (A through E) guide the test-taker in classifying these relationships as follows:

- (A) If one statement is the cause and the other is its effect.
- (B) If one statement is the effect and the other is its cause.
- (C) If both statements are independent causes.
- (D) If both statements are effects of independent causes.
- (E) If both statements are effects of some common cause.

e) Conclusion

Mastering the identification of cause-and-effect relationships enhances critical thinking and problem-solving skills. It requires careful analysis of events and understanding the underlying factors that connect them. This skill is not only pivotal in academic and professional settings but also in everyday decision-making processes.

► Directions to Solve

In each of the following questions, two statements numbered I and II are given. There may be cause and effect relationship between the two statements. These two statements may be the effect of the same cause or independent causes. These statements may be independent causes without having any relationship.

Read both the statements in each question and mark your answer as

- (A) If statement I is the cause and statement II is its effect;
- (B) If statement II is the cause and statement I is its effect;
- (C) If both the statements I and II are independent causes;
- (D) If both the statements I and II are effects of independent causes; and
- (E) If both the statements I and II are effects of some common cause.

Type-1

1. Statements:

- I. The prices of petrol and diesel in the domestic market have remained unchanged for the past few months.
- II. The crude oil prices in the international market have gone up substantially in the last few months.

- (A) Statement I is the cause and statement II is its effect
- (B) Statement II is the cause and statement I is its effect
- (C) Both the statements I and II are independent causes
- (D) Both the statements I and II are effects of independent causes
- (E) Both the statements I and II are effects of some common cause

Answer: Option (D)

Explanation:

The prices of petrol and diesel being stagnant in the domestic market and the increase in the same in the international market must be backed by independent causes.

2. Statements:

- I. The government has recently fixed the fees for professional courses offered by the unaided institutions which are much lower than the fees charged last year.
- II. The parents of the aspiring students launched a severe agitation last year protesting against the high fees charged by the unaided institutions.

- (A) Statement I is the cause and statement II is its effect
- (B) Statement II is the cause and statement I is its effect
- (C) Both the statements I and II are independent causes
- (D) Both the statements I and II are effects of independent causes
- (E) Both the statements I and II are effects of some common cause

Answer: Option (B)

Explanation:

The parents' protest against high fees being charged by the institutions led the government to interfere and fix the fees at a more affordable level.

3. Statements:

- I. The Reserve Bank of India has recently put restrictions on few small banks in the country.
- II. The small banks in the private and co-operative sector in India are not in a position to withstand the competitions of the bigger in the public sector.

- (A) Statement I is the cause and statement II is its effect
- (B) Statement II is the cause and statement I is its effect
- (C) Both the statements I and II are independent causes
- (D) Both the statements I and II are effects of independent causes
- (E) Both the statements I and II are effects of some common cause

Answer: Option (B)

Explanation:

The inability of the small banks to compete with the bigger ones shall not ensure security and good service to the customers, which is an essential concomitant that has to be looked into by the Reserve Bank. It seems to be a remedial step for the same.

4. Statements:

- I. All the schools in the area had to be kept closed for most part of the week.
- II. Many parents have withdrawn their children from the local schools.

- (A) Statement I is the cause and statement II is its effect
- (B) Statement II is the cause and statement I is its effect
- (C) Both the statements I and II are independent causes
- (D) Both the statements I and II are effects of independent causes
- (E) Both the statements I and II are effects of some common cause

Answer: Option (D)

Explanation:

Closing the schools for a week and the parents withdrawing their wards from the local schools are independent issues, which must have been triggered by different individual causes.

5. Statements:

- I. India has surpassed the value of tea exports this year over all the earlier years due to an increase in demand for quality tea in the European market.
- II. There is an increase in demand of coffee in the domestic market during the last two years.

- (A) Statement I is the cause and statement II is its effect
- (B) Statement II is the cause and statement I is its effect
- (C) Both the statements I and II are independent causes
- (D) Both the statements I and II are effects of independent causes
- (E) Both the statements I and II are effects of some common cause

Answer: Option (C)

Explanation:

The two statements discuss two separate statistical and generalised results.

6. Statements:

- I. There is unprecedented increase in the number of young unemployed in comparison to the previous year.
- II. A large number of candidates submitted applications against an advertisement for the post of manager issued by a bank.

- (A) Statement I is the cause and statement II is its effect
- (B) Statement II is the cause and statement I is its effect
- (C) Both the statements I and II are independent causes
- (D) Both the statements I and II are effects of independent causes
- (E) Both the statements I and II are effects of some common cause

Answer: Option (A)

Explanation:

An increase in the number of unemployed youth is bound to draw in huge crowds for a single vacancy.

7. Statements:

- I. The police authority has recently caught a group of house breakers.
- II. The citizens group in the locality have started night vigil in the area.

- (A) Statement I is the cause and statement II is its effect
- (B) Statement II is the cause and statement I is its effect
- (C) Both the statements I and II are independent causes
- (D) Both the statements I and II are effects of independent causes
- (E) Both the statements I and II are effects of some common cause

Answer: Option (E)

Explanation:

Both the statements are clearly backed by a common cause, which is clearly an increase in the number of thefts in the locality.

8. Statements:

- I. Majority of the students in the college expressed their opinion against the college authority's decision to break away from the university and become autonomous.
- II. The university authorities have expressed their inability to provide grants to its constituent colleges.

- (A) Statement I is the cause and statement II is its effect
- (B) Statement II is the cause and statement I is its effect
- (C) Both the statements I and II are independent causes
- (D) Both the statements I and II are effects of independent causes
- (E) Both the statements I and II are effects of some common cause

Answer: Option (B)

Explanation:

Clearly, the university's decision to refuse grant to the colleges must have triggered the college authority to become autonomous.

9. Statements:

- I. The literacy rate in the district has been increasing for the last four years.
- II. The district administration has conducted extensive training programme for the workers involved in the literacy drive.

- (A) Statement I is the cause and statement II is its effect
- (B) Statement II is the cause and statement I is its effect
- (C) Both the statements I and II are independent causes
- (D) Both the statements I and II are effects of independent causes
- (E) Both the statements I and II are effects of some common cause

Answer: Option (B)

Explanation:

Clearly, the increase in the literacy rate may be attributed directly to the stringent efforts of the district administration in this direction.

10. Statements:

- I. The school authority has asked the X Std. students to attend special classes to be conducted on Sundays.
- II. The parents of the X Std. students have withdrawn their wards from attending private tuitions conducted on Sundays.

- (A) Statement I is the cause and statement II is its effect
- (B) Statement II is the cause and statement I is its effect
- (C) Both the statements I and II are independent causes
- (D) Both the statements I and II are effects of independent causes
- (E) Both the statements I and II are effects of some common cause

Answer: Option (A)

Explanation:

It seems quite evident that the parents have instructed their wards to abstain from private tuitions on Sundays and attend special classes organised by the school.

Type-2

11. Statements:

- I. The Government has imported large quantities of sugar as per trade agreement with other countries.
- II. The prices of sugar in the domestic market have fallen sharply in the recent months.

- (A) Statement I is the cause and statement II is its effect
- (B) Statement II is the cause and statement I is its effect
- (C) Both the statements I and II are independent causes
- (D) Both the statements I and II are effects of independent causes
- (E) Both the statements I and II are effects of some common cause

Answer: Option (A)

Explanation:

The increase in supply always triggers a reduction in the prices.

12. Statements:

- I. There is sharp decline in the production of oil seeds this year.
- II. The Government has decided to increase the import quantum of edible oil.

- (A) Statement I is the cause and statement II is its effect
- (B) Statement II is the cause and statement I is its effect
- (C) Both the statements I and II are independent causes
- (D) Both the statements I and II are effects of independent causes
- (E) Both the statements I and II are effects of some common cause

Answer: Option (A)

Explanation:

A sharp decline in oilseed production is bound to reduce oil supply and import of oil is the only means to restore the essential supply.

13. Statements:

- I. The private medical colleges have increased the tuition fees in the current year by 200 per cent over the last year's fees to meet the expenses.
- II. The Government medical colleges have not increased their fees in spite of price escalation.

- (A) Statement I is the cause and statement II is its effect
- (B) Statement II is the cause and statement I is its effect
- (C) Both the statements I and II are independent causes
- (D) Both the statements I and II are effects of independent causes
- (E) Both the statements I and II are effects of some common cause

Answer: Option (C)

Explanation:

The increase in the fees of the private colleges and there being no increase in the same in Government colleges seem to be policy matters undertaken by the individual decisive boards at the two levels.

14. Statements:

- I. Large number of people living in the low-lying areas has been evacuated during the last few days to safer places.
- II. The Government has rushed in relief supplies to the people living in the affected areas.

- (A) Statement I is the cause and statement II is its effect
- (B) Statement II is the cause and statement I is its effect
- (C) Both the statements I and II are independent causes
- (D) Both the statements I and II are effects of independent causes
- (E) Both the statements I and II are effects of some common cause

Answer: Option (E)

Explanation:

Evacuating low-lying areas and rushing in relief to the affected areas clearly indicates that floods have occurred in the area.

15. Statements:

- I. It is the aim of the city's civic authority to get the air pollution reduced by 20% in the next two months.
- II. The number of asthma cases in the city is constantly increasing.

- (A) Statement I is the cause and statement II is its effect
- (B) Statement II is the cause and statement I is its effect
- (C) Both the statements I and II are independent causes
- (D) Both the statements I and II are effects of independent causes
- (E) Both the statements I and II are effects of some common cause

Answer: Option (B)

Explanation:

The increase in number of asthma cases must have alerted the authorities to take action to control air pollution that triggers the disease.

16. Statements:

- I. The local co-operative credit society has decided to stop giving loans to farmers with immediate effect.
- II. A large number of credit society members have withdrawn major part of their deposits from the credit society.

- (A) Statement I is the cause and statement II is its effect
- (B) Statement II is the cause and statement I is its effect
- (C) Both the statements I and II are independent causes
- (D) Both the statements I and II are effects of independent causes
- (E) Both the statements I and II are effects of some common cause

Answer: Option (B)

Explanation:

Clearly, withdrawal of funds by society members is bound to reduce the lending power of the society.

17. Statements:

- I. The employees of the biggest bank in the country have given an indefinite strike call starting from third of the next month.
- II. The employees of the Central Government have withdrawn their week long demonstrations.

- (A) Statement I is the cause and statement II is its effect
- (B) Statement II is the cause and statement I is its effect
- (C) Both the statements I and II are independent causes
- (D) Both the statements I and II are effects of independent causes
- (E) Both the statements I and II are effects of some common cause

Answer: Option (D)

Explanation:

The employees of a bank going on strike and the government employees calling off their protest seem to be two independent events that might have been triggered by individual causes.

18. Statements:

- I. Police resorted to lathi-charge to disperse the unlawful gathering of large number of people.
- II. The citizens' forum called a general strike in protest against the police atrocities.

- (A) Statement I is the cause and statement II is its effect
- (B) Statement II is the cause and statement I is its effect
- (C) Both the statements I and II are independent causes
- (D) Both the statements I and II are effects of independent causes
- (E) Both the statements I and II are effects of some common cause

Answer: Option (B)

Explanation:

Clearly, the people's mass protest against the police might have instigated the latter to indulge in lathi-charge to disperse the mob.

19. Statements:

- I. Majority of the citizens in the locality belongs to higher income group.
- II. The sales in the local super market are comparatively much higher than in other localities.

- (A) Statement I is the cause and statement II is its effect
- (B) Statement II is the cause and statement I is its effect
- (C) Both the statements I and II are independent causes
- (D) Both the statements I and II are effects of independent causes
- (E) Both the statements I and II are effects of some common cause

Answer: Option (A)

Explanation:

The comparatively higher sales in a particular locality are indicative of the high paying capacity of the residents of that locality.

20. Statements:

- I. The life today is too fast, demanding and full of variety in all aspects which at times leads to stressful situations.
- II. Number of suicide cases among teenagers is on increase.

- (A) Statement I is the cause and statement II is its effect
- (B) Statement II is the cause and statement I is its effect
- (C) Both the statements I and II are independent causes
- (D) Both the statements I and II are effects of independent causes
- (E) Both the statements I and II are effects of some common cause

Answer: Option (A)

Explanation:

Stress in everyday life is a major cause of frustration among the youth and is bound to lead them to take harsh steps as suicide.

Class 14: Analyzing Arguments

Analyzing an argument is a fundamental component of logical reasoning that involves evaluating a piece of text to understand the author's main point and the conclusions that can be drawn from their assertions. This process requires critical thinking to dissect the argument, identify its components, and assess its validity. The goal is to determine the strength of the argument and the extent to which the evidence supports the author's claims.

a) Components of an Argument

An argument typically consists of the following elements:

- ✓ **Premise(s):** Statements that provide the background or reasons supporting the conclusion. These are the foundational assertions that the argument is built upon.
- ✓ **Conclusion:** The main point or assertion that the author is trying to prove. This is derived from the premises and is the central idea of the argument.
- ✓ **Evidence:** Information or data presented to support the premises. Evidence strengthens the argument by providing concrete details that back up the assertions made.

b) Steps in Analyzing an Argument

To effectively analyze an argument, one should follow these steps:

- ✓ **Identify the Conclusion:** Determine what the author is trying to prove or argue.
- ✓ **Find the Premises:** Look for statements that support the conclusion. These are the reasons given to persuade the reader.
- ✓ **Evaluate the Evidence:** Assess the quality and relevance of the evidence provided to support the premises. Consider whether it is sufficient, reliable, and applicable.
- ✓ **Check for Assumptions:** Identify any unstated assumptions that the argument relies on. An assumption is something taken for granted but is essential for the argument to hold.
- ✓ **Consider Counterarguments:** Think about potential objections to the argument or alternative explanations. This helps in assessing the argument's strength and possible weaknesses.

c) Determining the Main Point and Drawing Conclusions

After breaking down the argument, the next step is to determine the main point the author is trying to make. This involves synthesizing the information presented to understand the core message. The conclusion that can be drawn from the argument depends on how well the premises support the conclusion and the strength of the evidence provided.

When presented with multiple statements following an argument, the task is to identify which statement best supports the author's argument. This requires:

Understanding the Argument's Structure: Recognizing how the premises lead to the conclusion.

Assessing Relevance and Support: Evaluating which statement most directly strengthens the connection between the premises and the conclusion.

Critical Thinking: Applying logical principles to discern the most compelling support for the argument's main point.

d) Conclusion

Analyzing an argument is a critical skill in logical reasoning that enables individuals to dissect complex texts, understand different viewpoints, and evaluate the strength of claims based on evidence and logical coherence. This process is vital for effective decision-making, academic research, and engaging in informed discussions.

1. Scenario: Climate Change Conference Debate

During a climate change conference, Dr. Greene argues that rising global temperatures are primarily due to human activities, particularly fossil fuel combustion. Dr. Smith counters by highlighting natural climate cycles, suggesting these are significant contributors to the observed warming.

Question: What is Dr. Greene's conclusion in the argument?

- A. Fossil fuels should be banned immediately.
- B. Human activities are the primary cause of global warming.
- C. Natural climate cycles do not exist.
- D. Dr. Smith disagrees with the concept of climate change.

Answer: B. Human activities are the primary cause of global warming.

Explanation: Dr. Greene's argument focuses on human activities, especially fossil fuel combustion, as the main cause of global warming, making option B the correct conclusion of the argument. Options A, C, and D introduce statements that were not made or implied by Dr. Greene, hence are incorrect.

2. Scenario: Educational Reform Panel Discussion

In a panel discussion about educational reform, one speaker argues that the integration of technology in classrooms has led to improved student learning outcomes. They cite studies showing higher engagement and test scores with the use of digital tools.

Question: What is the primary premise of the speaker's argument?

- A. Technology should replace traditional teaching methods.
- B. Studies show that technology improves engagement and test scores.
- C. All students have access to digital tools.
- D. Traditional teaching methods are ineffective.

Answer: B. Studies show that technology improves engagement and test scores.

Explanation: The speaker's argument is based on the premise that studies have found technology integration leads to higher engagement and test scores, making B the correct answer. Options A, C, and D are not directly supported by the speaker's cited evidence.

3. Scenario: Health and Diet Forum Discussion

At a health and diet forum, a nutritionist presents the argument that a plant-based diet can significantly reduce the risk of developing chronic diseases. The nutritionist supports this claim by referencing longitudinal studies comparing health outcomes of vegetarians and non-vegetarians.

Question: Which of the following best supports the nutritionist's argument?

- A. Vegetarians live longer on average than non-vegetarians.
- B. Meat production has a high environmental impact.
- C. Plant-based diets are more ethical.
- D. Chronic diseases cannot be reversed once developed.

Answer: A. Vegetarians live longer on average than non-vegetarians.

Explanation: Option A directly supports the nutritionist's argument by providing a tangible outcome (longevity) associated with a plant-based diet, which is relevant to the discussion on chronic diseases. Options B and C introduce unrelated aspects, and D presents a generalized statement not directly supporting the argument about diet and disease prevention.

4. Scenario: Technology Advancement Debate

In a debate on technology advancement, one participant argues that artificial intelligence (AI) will create more jobs than it displaces. They cite historical examples of technological innovations leading to new industries and employment opportunities.

Question: What assumption underlies the participant's argument?

- A. AI development is ethically sound.
- B. Historical patterns of job creation will continue with AI.
- C. All displaced workers will easily find new employment in AI-related fields.
- D. AI poses no risks to humanity.

Answer: B. Historical patterns of job creation will continue with AI.

Explanation: The participant's argument assumes that the historical patterns of technological innovations creating new jobs will apply similarly to AI, making B the correct choice. Options A, C, and D introduce assumptions and considerations not directly related to the argument's focus on job creation versus displacement.

5. Scenario: Environmental Policy Proposal Meeting

At a meeting discussing environmental policy proposals, a lawmaker argues for stricter regulations on industrial emissions based on the premise that such regulations have historically led to significant improvements in air quality and public health.

Question: Which of the following strengthens the lawmaker's argument?

- A.** Industries report potential economic downturns due to strict regulations.
- B.** Studies show a direct correlation between emission regulations and air quality improvement.
- C.** Some countries without strict regulations also experience improved air quality.
- D.** Public opinion is divided on the necessity of stricter regulations.

Answer: B. Studies show a direct correlation between emission regulations and air quality improvement.

Explanation: Option B directly strengthens the lawmaker's argument by providing evidence (studies showing a correlation between regulations and air quality improvement) that supports the premise that stricter regulations lead to air quality and public health benefits. Options A, C, and D introduce factors that do not directly support the argument's premise on the effectiveness of regulations.

6. Scenario: Corporate Sustainability Strategy Meeting

During a strategy meeting at a large corporation, an executive proposes investing in renewable energy sources. The executive argues this will not only reduce the company's carbon footprint but also decrease long-term operational costs due to lower energy prices and government incentives.

Question: What is the executive's main conclusion?

- A.** Renewable energy sources are cheaper than traditional energy sources.
- B.** Government incentives make renewable energy investment appealing.
- C.** Investing in renewable energy will benefit the company financially and environmentally.
- D.** The company's carbon footprint is currently too high.

Answer: C. Investing in renewable energy will benefit the company financially and environmentally.

Explanation: The executive's conclusion combines the environmental and financial benefits of investing in renewable energy, making C the correct answer. Options A and B are part of the premises leading to the conclusion, while D is an implied concern but not the conclusion itself.

7. Scenario: Local Government Health Initiative Discussion

A local government official proposes a new health initiative aimed at increasing public green spaces. They argue that such spaces encourage physical activity and community gatherings, which are beneficial for mental and physical health, citing studies that link green spaces to lower rates of obesity and depression.

Question: Which evidence best supports the official's argument?

- A. Green spaces increase property values in the surrounding areas.
- B. Communities with more green spaces report higher satisfaction levels.
- C. Obesity and depression rates are lower in areas with ample green spaces.
- D. Green spaces require significant maintenance costs.

Answer: C. Obesity and depression rates are lower in areas with ample green spaces.

Explanation: Option C directly supports the official's argument by providing a clear link between the presence of green spaces and the health benefits being discussed, making it the best evidence. Options A and B are positive effects but not directly tied to health outcomes, while D introduces a potential drawback.

8. Scenario: Educational Technology Investment Pitch

In a pitch to investors, a startup founder argues for the potential of an educational technology app to revolutionize learning. The founder highlights the app's use of adaptive learning algorithms to personalize education, leading to improved student engagement and outcomes.

Question: What assumption is the founder making?

- A. Personalized education is the future of learning.
- B. All students have access to the technology needed to use the app.
- C. Traditional education methods are ineffective.
- D. Investors are familiar with adaptive learning algorithms.

Answer: A. Personalized education is the future of learning.

Explanation: The founder's argument assumes that the approach of personalized education, facilitated by their app, is the direction in which learning will evolve, making A the correct choice. Options B, C, and D introduce considerations not directly related to the core assumption behind the pitch.

9. Scenario: Urban Development Public Forum

At a public forum on urban development, an activist argues against the construction of a new shopping mall, claiming it will lead to increased traffic congestion and pollution. They base their argument on studies from similar developments in other cities.

Question: Which of the following undermines the activist's argument?

- A. The city plans to improve public transportation access to the mall.
- B. Other cities have seen economic growth from similar developments.
- C. The shopping mall will include green spaces and recreational areas.
- D. Pollution levels have been rising in the city over the past decade.

Answer: A. The city plans to improve public transportation access to the mall.

Explanation: Option A undermines the activist's argument by suggesting a mitigation strategy for the anticipated traffic congestion and pollution, challenging the direct negative outcomes they predict. Options B and C introduce potentially positive aspects but do not directly counter the concerns about traffic and pollution, while D provides background information but doesn't address the argument's causality.

10. Scenario: Non-Profit Organization Strategy Session

In a strategy session for a non-profit organization focused on literacy, a board member argues for expanding digital library services. They claim this expansion is crucial for reaching underserved populations, citing data on increased accessibility and usage in areas where digital libraries are available.

Question: What is the board member's main conclusion?

- A. Digital libraries are more popular than physical libraries.
- B. Underserved populations benefit significantly from digital library services.
- C. All libraries should transition to digital formats.
- D. Expanding digital library services will enhance the organization's reach and impact.

Answer: D. Expanding digital library services will enhance the organization's reach and impact.

Explanation: The board member's conclusion focuses on the benefits of expanding digital services to enhance reach and impact, particularly for underserved populations, making D the correct answer. Options A and C present broader assertions about digital vs. physical libraries, and B identifies a beneficiary but does not encapsulate the conclusion's full scope.

11. Scenario: Tech Conference Panel on Privacy

During a panel discussion at a tech conference, an expert argues that privacy regulations have not kept pace with technological advancements. They cite instances where personal data misuse occurred despite existing laws, suggesting an urgent need for updated legislation.

Question: What is the expert's primary premise?

- A. Technological advancements are inherently dangerous.
- B. Existing privacy laws are outdated.
- C. Personal data misuse is rampant in the tech industry.
- D. New legislation is difficult to implement.

Answer: B. Existing privacy laws are outdated.

Explanation: The expert's argument is based on the premise that existing privacy laws are outdated in the context of current technological capabilities, making B the correct answer. Options A and C introduce

additional considerations, while D discusses a challenge but does not represent the primary premise of the argument.

12. Scenario: Environmental NGO Campaign Launch

An environmental NGO launches a campaign to promote ocean conservation. They argue that reducing plastic waste is crucial to protecting marine life, citing studies that link plastic debris to harm in marine ecosystems.

Question: Which of the following strengthens the NGO's argument?

- A. Most plastic waste originates from land-based sources.
- B. Marine life is resilient to environmental changes.
- C. Ocean tourism generates significant revenue for coastal communities.
- D. Some countries have banned single-use plastics.

Answer: A. Most plastic waste originates from land-based sources.

Explanation: Option A strengthens the NGO's argument by highlighting the source of the problem (plastic waste from land) that the campaign aims to address, thereby supporting the causal link between reducing plastic waste and protecting marine life. Options B and C introduce unrelated aspects, while D shows action being taken but does not directly strengthen the argument about the crucial nature of reducing plastic waste.

13. Scenario: Health Policy Debate on Vaccination

In a debate on health policy, a public health official argues for mandatory vaccination policies. They claim such policies are necessary to achieve herd immunity and prevent outbreaks of infectious diseases, citing evidence of reduced disease incidence in regions with high vaccination rates.

Question: What assumption underlies the official's argument?

- A. Vaccinations are always safe and effective.
- B. Herd immunity cannot be achieved without mandatory policies.
- C. Everyone has access to vaccinations.
- D. Infectious diseases are the biggest threat to public health.

Answer: B. Herd immunity cannot be achieved without mandatory policies.

Explanation: The official's argument assumes that to achieve herd immunity and prevent disease outbreaks, mandatory vaccination policies are necessary, making B the correct choice. Options A, C, and D introduce broader considerations about vaccinations and public health but do not directly relate to the core assumption about the necessity of mandatory policies.

14. Scenario: International Conference on Cybersecurity

At an international conference on cybersecurity, a speaker argues that cybersecurity threats have evolved faster than companies can adapt their defenses. They cite a surge in sophisticated cyber attacks that exploit new vulnerabilities, calling for a proactive and dynamic approach to cybersecurity.

Question: What is the speaker's main conclusion?

- A. Cyber attacks are becoming more sophisticated.
- B. Companies are not investing enough in cybersecurity.
- C. A proactive and dynamic approach to cybersecurity is needed.
- D. Cybersecurity threats are a top global concern.

Answer: C. A proactive and dynamic approach to cybersecurity is needed.

Explanation: The speaker's conclusion is that a proactive and dynamic approach to cybersecurity is essential to address the rapidly evolving threats, making C the correct answer. Options A and D describe aspects of the problem, while B suggests a potential cause but does not capture the speaker's main conclusion.

15. Scenario: Urban Planning Committee Meeting on Public Parks

In a meeting of the urban planning committee, a member argues for the expansion of public parks. They claim that public parks not only provide recreational opportunities but also contribute to the mental health of the community, citing research on the positive psychological effects of green spaces.

Question: Which of the following best supports the committee member's argument?

- A. Public parks increase the aesthetic value of urban areas.
- B. Property values near public parks are higher.
- C. Research shows green spaces have positive effects on mental health.
- D. Parks provide habitats for urban wildlife.

Answer: C. Research shows green spaces have positive effects on mental health.

Explanation: Option C directly supports the committee member's argument by linking the presence of green spaces (public parks) with positive mental health outcomes, making it the most relevant evidence. Options A, B, and D highlight other benefits of public parks but do not directly support the argument regarding mental health.

16. Scenario: Finance Conference Discussion on Cryptocurrency

In a discussion at a finance conference, an economist argues that cryptocurrencies represent a significant shift in the global financial system. They suggest that the decentralized nature of cryptocurrencies challenges traditional banking and could lead to greater financial inclusivity.

Question: What assumption underlies the economist's argument?

- A.** Cryptocurrencies are more stable than traditional currencies.
- B.** Decentralization inherently leads to financial inclusivity.
- C.** All individuals have access to the internet and technology needed for cryptocurrency.
- D.** Traditional banks are opposed to cryptocurrency.

Answer: B. Decentralization inherently leads to financial inclusivity.

Explanation: The economist's argument is based on the assumption that the decentralized nature of cryptocurrencies inherently leads to greater financial inclusivity, making B the correct choice. Options A, C, and D introduce considerations that are not directly related to the core assumption about decentralization and inclusivity.

17. Scenario: Workshop on Sustainable Agriculture

During a workshop on sustainable agriculture, a speaker argues that adopting organic farming practices can significantly reduce environmental impact. They point to studies showing lower pesticide use and improved soil health in organic farming compared to conventional methods.

Question: Which of the following best supports the speaker's argument?

- A.** Organic foods are often more expensive than conventionally grown foods.
- B.** Consumers show a growing preference for organic produce.
- C.** Studies indicate lower pesticide use and improved soil health in organic farming.
- D.** Organic farming requires more labor-intensive practices.

Answer: C. Studies indicate lower pesticide use and improved soil health in organic farming.

Explanation: Option C directly supports the speaker's argument by providing evidence (lower pesticide use and improved soil health) that organic farming practices have a reduced environmental impact, making it the most relevant support. Options A, B, and D mention aspects of organic farming but do not directly support the argument about environmental impact.

18. Scenario: Conference on Digital Education

At a conference on digital education, a researcher presents findings suggesting that digital learning platforms can enhance student collaboration and problem-solving skills. They cite specific studies where students using these platforms showed significant improvements in these areas.

Question: What is the researcher's main conclusion?

- A.** Digital learning platforms are superior to traditional learning methods.
- B.** Student collaboration and problem-solving skills can be enhanced through digital platforms.
- C.** All schools should adopt digital learning platforms.

- D.** Traditional learning methods do not encourage collaboration.

Answer: B. Student collaboration and problem-solving skills can be enhanced through digital platforms.

Explanation: The researcher's conclusion is that digital learning platforms can enhance specific skills (collaboration and problem-solving), making B the correct answer. While A and C suggest broader implications and D presents a comparative judgment not directly stated by the researcher, B accurately captures the essence of the presented findings.

19. Scenario: International Summit on Renewable Energy

At an international summit on renewable energy, a policy analyst argues that transitioning to renewable energy sources is not only vital for combating climate change but also for ensuring energy security. The analyst supports their argument with data on countries that have significantly reduced their dependence on imported fossil fuels by investing in renewables like wind and solar power.

Question: Which of the following strengthens the analyst's argument?

- A.** Renewable energy technologies are becoming increasingly cost-effective.
- B.** Some countries remain heavily dependent on coal for energy production.
- C.** Fossil fuel markets are subject to volatile price fluctuations.
- D.** Renewable energy installations can have high initial costs.

Answer: A. Renewable energy technologies are becoming increasingly cost-effective.

Explanation: Option A directly strengthens the policy analyst's argument by addressing the economic viability and sustainability aspect of renewable energy, making it supportive evidence that transitioning to renewables is both environmentally and financially prudent. Options B and D introduce challenges or counterpoints that do not directly support the argument, while C provides background information on fossil fuels but does not specifically strengthen the argument about energy security and climate change benefits.

20. Scenario: National Conference on Mental Health Awareness

At a national conference on mental health awareness, a clinical psychologist argues that early intervention programs in schools can significantly reduce the long-term impact of mental health issues in adolescents. The psychologist bases their argument on longitudinal studies showing that students who received early intervention had better mental health outcomes in adulthood.

Question: What assumption underlies the psychologist's argument?

- A.** All schools have the resources to implement early intervention programs.
- B.** Early intervention in schools is the most effective form of mental health treatment.
- C.** Mental health issues in adolescents are largely preventable.
- D.** Early intervention can lead to better long-term mental health outcomes.

Answer: D. Early intervention can lead to better long-term mental health outcomes.

Explanation: The psychologist's argument assumes that early intervention (when provided during adolescence) leads to improved mental health outcomes later in life, making D the correct choice. This assumption is foundational to advocating for such programs in schools. Options A and B introduce broader considerations about resources and efficacy, while C suggests a generalization about preventability that goes beyond the scope of the psychologist's argument based on specific studies.

Class 15: Matching Definitions

The topic of "Matching Definitions" in logical reasoning involves the process of identifying instances or examples that best fit a given definition or description. This skill is crucial for understanding concepts, applying theoretical knowledge to real-world situations, and enhancing comprehension and analytical abilities. It requires careful reading, comprehension of definitions, and the ability to discriminate between closely related ideas or situations to identify the most accurate match.

a) Understanding "Matching Definitions"

- ✓ **Definition Identification:** The first step is to clearly understand the definition or description provided. This involves parsing the language for key components that must be present in the correct answer.
- ✓ **Option Analysis:** Each option provided must be analyzed in the context of the definition. This step involves identifying the presence or absence of key components outlined in the definition within each option.
- ✓ **Best Match Selection:** The option that contains all or the most critical elements of the definition is selected as the best match. This may require prioritizing certain aspects of the definition over others when options contain some but not all elements.
- ✓ **Elimination of Inaccurate Matches:** Options that do not fully meet the definition or only partially meet it with less relevance than the best match are eliminated.

b) Strategies for "Matching Definitions"

Key Term Focus: Concentrate on the key terms and criteria specified in the definition. Each option must be evaluated for these key terms.

- ✓ **Context Consideration:** Understand the context of the definition. Some definitions may have broader implications or be subject to specific conditions.
- ✓ **Comparative Analysis:** Compare options directly against each other to determine which one more fully embodies the definition.
- ✓ **Avoiding Distractions:** Beware of options designed to distract or mislead by introducing irrelevant details or partially matching the definition.

c) Application in Logical Reasoning

"Matching Definitions" questions test one's ability to apply abstract concepts in concrete situations, a critical skill in logical reasoning. These questions can cover a wide range of topics, from employment scenarios, as illustrated in the given example, to more abstract concepts like justice, ethics, or theoretical models.

d) Conclusion

"Matching Definitions" requires a nuanced understanding of language and the ability to apply abstract definitions to specific examples. Mastery of this skill enhances logical reasoning capabilities, aiding in the precise interpretation and application of concepts across various contexts.

Type-1

► Directions to Solve

Read each definition and all four choices carefully, and find the answer that provides the best example of the given definition.

1. **Applying for Seasonal Employment** occurs when a person requests to be considered for a job that is dependent on a particular season or time of year. Which situation below is the best example of Applying for Seasonal Employment?

- (A) The ski instructors at Top of the Peak Ski School work from December through March.
- (B) Matthew prefers jobs that allow him to work outdoors.
- (C) Lucinda makes an appointment with the beach resort restaurant manager to interview for the summer waitressing position that was advertised in the newspaper.
- (D) Doug's ice cream shop stays open until 11 p.m. during the summer months.

Answer: Option (C)

Explanation:

Although the ski instructors at Top of the Peak Ski School do work seasonally, choice a does not describe anyone applying for seasonal employment. In choice b, the statement that Matthew likes to work outdoors tells us nothing about seasonal employment or someone applying for it. And although choice d describes a business with seasonal hours, it does not describe a person applying for seasonal work. Choice c, on the other hand, very specifically depicts a person, Lucinda, who is applying for a job as a summer waitress at a beach resort, which is dependent upon a particular season of the year.

2. **Violating an Apartment Lease** occurs when a tenant does something prohibited by the legally binding document that he or she has signed with a landlord. Which situation below is the best example of Violating an Apartment Lease?

- (A) Tim has decided to move to another city, so he calls his landlord to tell him that he is not interested in renewing his lease when it expires next month.
- (B) Valerie recently lost her job and, for the last three months, has neglected to pay her landlord the monthly rent they agreed upon in writing when she moved into her apartment eight months ago.
- (C) Mark writes a letter to his landlord that lists numerous complaints about the apartment he has agreed to rent for two years.
- (D) Leslie thinks that her landlord is neglecting the building in which she rents an apartment. She calls her attorney to ask for advice.

Answer: Option (B)

Explanation:

Valerie signed a legally binding document that requires her to pay a monthly rent for her apartment and she has failed to do this for the last three months. Therefore, she has violated her apartment lease.

3. An **Informal Gathering** occurs when a group of people get together in a casual, relaxed manner. Which situation below is the best example of an Informal Gathering?

- (A) The book club meets on the first Thursday evening of every month.
- (B) After finding out about his promotion, Jeremy and a few coworkers decide to go out for a quick drink after work.
- (C) Mary sends out 25 invitations for the bridal shower she is giving for her sister.
- (D) Whenever she eats at the Mexican restaurant, Clara seems to run into Peter.

Answer: Option (B)

Explanation:

After getting some good news, Jeremy and a few friends casually get together for a drink after work, thereby having an informal gathering. Choices a and c describe more formal types of gatherings. Choice d describes a chance or coincidental kind of meeting.

4. People **speculate** when they consider a situation and assume something to be true based on inconclusive evidence. Which situation below is the best example of Speculation ?

- (A) Francine decides that it would be appropriate to wear jeans to her new office on Friday after reading about "Casual Fridays" in her employee handbook.
- (B) Mary spends thirty minutes sitting in traffic and wishes that she took the train instead of driving.
- (C) After consulting several guidebooks and her travel agent, Jennifer feels confident that the hotel she has chosen is first-rate.
- (D) When Emily opens the door in tears, Theo guesses that she's had a death in her family.

Answer: Option (D)

Explanation:

This is the only situation in which someone makes an assumption that is not based on conclusive evidence. Choices a and c reflect situations in which assumptions are made based on evidence. In choice b, Mary is not assuming anything to be true. She is simply wishing that she'd made a different decision.

5. **Posthumous Publication** occurs when a book is published after the author's death. Which situation below is the best example of Posthumous Publication ?

- (A) Richard's illness took his life before he was able to enjoy the amazing early reviews of his novel.
- (B) Melissa's publisher cancels her book contract after she fails to deliver the manuscript on time.
- (C) Clarence never thought he'd live to see the third book in his trilogy published.
- (D) Elizabeth is honored with a prestigious literary award for her writing career and her daughter accepts the award on behalf of her deceased mother.

Answer: Option (A)

Explanation:

Although choice d also mentions a writer who has died, it does not state that one of the writer's books was published after her death, only that she received an award. Choice a states that Richard wasn't around to see the early reviews of his novel, therefore implying that Richard died before the book was published. The other two options depict living writers.

6. A **Guarantee** is a promise or assurance that attests to the quality of a product that is either (1) given in writing by the manufacturer or (2) given verbally by the person selling the product. Which situation below is the best example of a Guarantee?
- (A) Melissa purchases a DVD player with the highest consumer ratings in its category.
 - (B) The salesperson advises Curt to be sure that he buys an air conditioner with a guarantee.
 - (C) The local auto body shop specializes in refurbishing and selling used cars.
 - (D) Lori buys a used digital camera from her coworker who says that she will refund Lori's money if the camera's performance is not of the highest quality.

Answer: Option (D)

Explanation:

Choices a, b, and c do not describe situations in which a product is guaranteed. Only choice d reflects a situation in which a seller attests to the quality of a product by giving the buyer a promise or assurance about its quality.

7. The rules of baseball state that a batter **Legally Completes His Time at Bat** when he is put out or becomes a base runner. Which situation below is the best example of a batter Legally Completing His Time at Bat?
- (A) Jared's blooper over the head of the short-stop puts him in scoring position.
 - (B) The umpire calls a strike, even though the last pitch was way outside.
 - (C) The pitcher throws his famous knuckleball, Joe swings and misses, and the umpire calls a strike.
 - (D) The count is two balls and two strikes as Mario waits for the next pitch.

Answer: Option (A)

Explanation:

The fact that Jared is in scoring position due to his blooper indicates that he has hit the ball and is now a base runner; therefore, he has legally completed his time at bat. Choices b and c both describe situations in which a strike is called, but they do not state that the batter has been put out or that he is now a base runner. Choice d describes a situation in which the batter, Mario, is still at the plate waiting for the next pitch.

8. **Erratic Behavior** occurs when an individual acts in a manner that lacks consistency, regularity, and uniformity. Which situation below is the best example of Erratic Behavior?
- (A) Julia cannot contain her anger whenever the subject of local politics is discussed.
 - (B) Martin has just been told that he is being laid off. Before leaving his supervisor's office, he punches a hole in the door.
 - (C) Rhonda has visited the dealership several times, but she still cannot decide which car to buy.
 - (D) In the past month, Jeffrey, who has been a model employee for three years, has repeatedly called in sick, forgotten important meetings, and been verbally abusive to colleagues.

Answer: Option (D)

Explanation:

Jeffrey's recent behavior is clearly inconsistent and irregular.

9. A **Tiebreaker** is an additional contest or period of play designed to establish a winner among tied contestants. Which situation below is the best example of a Tiebreaker?

- (A) At halftime, the score is tied at 28.
- (B) Mary and Megan have each scored three goals in the game.
- (C) The referee tosses a coin to decide which team will have possession of the ball first.
- (D) The Sharks and the Bears each finished with 14 points, and they are now battling it out in a five-minute overtime.

Answer: Option (D)

Explanation:

This is the only choice that indicates that an additional period of play is taking place to determine the winner of a game that ended in a tie.

10. In the Maple Hill school district, a **Five-Day Suspension** occurs when a student is not permitted to attend school for five days for (1) physically assaulting another student, a teacher, or a school employee or (2) willfully destructing or defacing school property. Which situation below is the best example of a Five-Day Suspension?

- (A) Lillian gets caught cheating on a math test for the second time and is suspended from school.
- (B) Marc is asked to leave the classroom due to his constant disruptions.
- (C) Franny uses spray paint to write derogatory comments on the locker room wall and she is given a suspension.
- (D) Ms. Farmer tells her class that students who fail the midterm exam will be expected to stay after school for tutoring help.

Answer: Option (C)

Explanation:

Although choices a and c both describe suspensions, only choice c describes a suspension that is the result of one of the two scenarios given in the definition of a five-day suspension (physical assault or destructing or defacing school property). Therefore, we can assume that Franny's suspension, which is the result of spray painting school property, will be a five-day suspension. Since the definition doesn't provide any information about suspensions for cheating, we can assume that Lillian's suspension does not fall into the five-day suspension category.

11. It is appropriate to compensate someone if you have damaged his or her property in some way. This is called **Restitution**. Which situation below is the best example of Restitution?

- (A) Jake borrows Leslie's camera and the lens shatters when it falls on the ground because he fails to zipper the case. When Jake returns the camera, he tells Leslie that he will pay for the repair.
- (B) Rebecca borrows her neighbor's car, and when she returns it, the gas tank is practically empty. She apologizes profusely and tells her neighbor she will be more considerate the next time.
- (C) Aaron asks Tom to check in on his apartment while he is out of town. When Tom arrives, he discovers that a pipe has burst and there is a considerable amount of water damage. He calls a plumber to repair the pipe.
- (D) Lisa suspects that the pothole in her company's parking lot caused her flat tire. She tells her boss that she thinks the company should pay for the repair.

Answer: Option (A)

Explanation:

Jake damaged Leslie's camera while it was in his possession and he has agreed to compensate Leslie for the cost of the repair.

Section - 2

Data

Interpretation

C. Data Interpretation

Logical Reasoning in Applied Data Interpretation

Applied Data Interpretation (ADI) is a crucial component of logical reasoning that involves analyzing, understanding, and making reasoned conclusions based on various forms of data presentation. It encompasses the ability to interpret and deduce information from line charts, bar charts, pie charts, and tables. Each of these data visualization types serves a unique purpose in presenting data, and understanding them is vital for students, researchers, and individuals preparing for competitive examinations.

a) Line Charts

Definition: Line charts are used to display data points connected by straight lines, typically to show trends over time.

➤ **Key Aspects:**

- ✓ Identifying trends (upward, downward, constant)
- ✓ Understanding the significance of slopes and their steepness
- ✓ Comparing multiple data series over the same period
- ✓ Application: Ideal for visualizing changes and trends in data over time, such as stock market fluctuations, temperature changes, or sales over months.

b) Bar Charts

Definition: Bar charts represent data with rectangular bars with lengths proportional to the values they represent.

➤ **Key Aspects:**

- ✓ Comparing quantities among different categories
- ✓ Horizontal or vertical orientation
- ✓ Single or grouped bars for comparing multiple datasets
- ✓ Application: Useful for comparing data across different categories, such as sales by product category, population by country, or expenses by department.

c) Pie Charts

Definition: Pie charts are circular charts divided into sectors, each representing a proportion of the whole.

➤ **Key Aspects:**

- ✓ Visualizing the composition of a whole
- ✓ Comparing parts to the whole rather than to each other
- ✓ Limitations in readability with too many categories

- ✓ Application: Effective for showing percentage or proportional data, such as market share, survey results, or budget allocations.

d) Tables

Definition: Tables organize data in rows and columns, providing a structured format for detailed comparison and analysis.

➤ Key Aspects:

- ✓ Facilitating detailed comparisons and specific value identification
- ✓ Accommodating various data types (numerical, textual)
- ✓ Versatility in presenting complex datasets with multiple variables
- ✓ Application: Tables are versatile for detailed data presentation, such as financial reports, research data, and statistical summaries.

C.1 Importance for Students, Researchers, and Competitive Examinations

- ✓ **Students:** Understanding data interpretation tools equips students with the ability to critically analyze information presented in various formats, enhancing their academic performance and preparing them for real-world problem-solving.
- ✓ **Researchers:** For researchers, ADI is fundamental in analyzing experimental or survey data, drawing conclusions, and supporting hypotheses. Mastery of these tools allows for effective communication of findings and data-driven decision-making.
- ✓ **Competitive Examinations:** In competitive exams, ADI questions test candidates' abilities to quickly interpret data, make calculations, and apply logical reasoning to solve problems. High proficiency in ADI can significantly impact the overall performance due to its prevalence in aptitude testing.

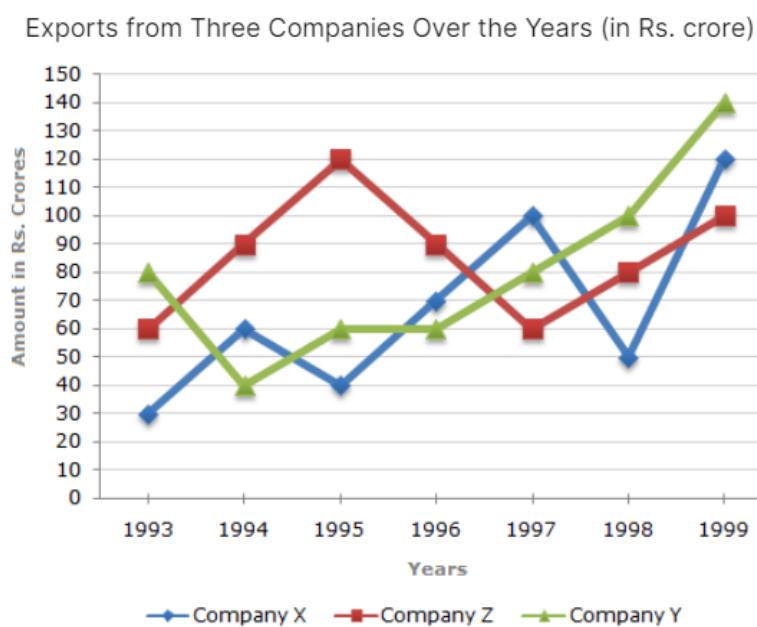
➤ Conclusion

Logical reasoning in Applied Data Interpretation is an essential skill set that transcends academic and professional boundaries. It involves not just the mechanical interpretation of data but also the application of logical reasoning to draw conclusions, identify patterns, and make decisions based on the data presented. Mastery of line charts, bar charts, pie charts, and tables is crucial for effective data analysis, critical thinking, and problem-solving in various contexts. For students, researchers, and competitive exam aspirants, ADI is a key component of their toolkit, enabling them to navigate and make sense of the data-driven world.

Class 1: Line Plots

► Directions to Solve

Study the following line graph and answer the questions.



1. For which of the following pairs of years the total exports from the three Companies together are equal?

- (A) 1995 and 1998
- (B) 1996 and 1998
- (C) 1997 and 1998
- (D) 1995 and 1996

Answer: Option (D)

Explanation:

Total exports of the three Companies X, Y and Z together, during various years are:

In 1993 = Rs. $(30 + 80 + 60)$ crores = Rs. 170 crores.

In 1994 = Rs. $(60 + 40 + 90)$ crores = Rs. 190 crores.

In 1995 = Rs. $(40 + 60 + 120)$ crores = Rs. 220 crores.

In 1996 = Rs. $(70 + 60 + 90)$ crores = Rs. 220 crores.

In 1997 = Rs. $(100 + 80 + 60)$ crores = Rs. 240 crores.

In 1998 = Rs. $(50 + 100 + 80)$ crores = Rs. 230 crores.

In 1999 = Rs. $(120 + 140 + 100)$ crores = Rs. 360 crores.

Clearly, the total exports of the three Companies X, Y and Z together are same during the years 1995 and 1996.

2. Average annual exports during the given period for Company Y is approximately what percent of the average annual exports for Company Z?

- (A) 87.12%
- (B) 89.64%
- (C) 91.21%
- (D) 93.33%

Answer: Option (D)

Explanation:

Analysis of the graph: From the graph it is clear that

The amount of exports of Company X (in crore Rs.) in the years 1993, 1994, 1995, 1996, 1997, 1998 and 1999 are 30, 60, 40, 70, 100, 50 and 120 respectively.

The amount of exports of Company Y (in crore Rs.) in the years 1993, 1994, 1995, 1996, 1997, 1998 and 1999 are 80, 40, 60, 60, 80, 100 and 140 respectively.

The amount of exports of Company Z (in crore Rs.) in the years 1993, 1994, 1995, 1996, 1997, 1998 and 1999 are 60, 90, 120, 90, 60, 80 and 100 respectively.

Average annual exports (in Rs. crore) of Company Y during the given period

$$= \frac{1}{7} \times (80 + 40 + 60 + 60 + 80 + 100 + 140) = \frac{560}{7} = 80.$$

Average annual exports (in Rs. crore) of Company Z during the given period

$$= \frac{1}{7} \times (60 + 90 + 120 + 90 + 60 + 80 + 100) = \left(\frac{600}{7} \right).$$

$$\therefore \text{Required percentage} = \left[\frac{\frac{80}{\left(\frac{600}{7} \right)} \times 100}{\left(\frac{600}{7} \right)} \right] \% \approx 93.33\%.$$

3. In which year was the difference between the exports from Companies X and Y the minimum?

- (A) 1994
- (B) 1995
- (C) 1996
- (D) 1997

Answer: Option (C)

Explanation:

The difference between the exports from the Companies X and Y during the various years are:

In 1993 = Rs. (80 - 30) crores = Rs. 50 crores.

In 1994 = Rs. (60 - 40) crores = Rs. 20 crores.

In 1995 = Rs. (60 - 40) crores = Rs. 20 crores.

In 1996 = Rs. (70 - 60) crores = Rs. 10 crores.

In 1997 = Rs. (100 - 80) crores = Rs. 20 crores.

In 1998 = Rs. (100 - 50) crores = Rs. 50 crores.

In 1999 = Rs. (140 - 120) crores = Rs. 20 crores.

Clearly, the difference is minimum in the year 1996.

4. What was the difference between the average exports of the three Companies in 1993 and the average exports in 1998?

- (A) Rs. 15.33 crores
- (B) Rs. 18.67 crores
- (C) Rs. 20 crores
- (D) Rs. 22.17 crores

Answer: Option (C)

Explanation:

Average exports of the three Companies X, Y and Z in 1993

$$= \text{Rs.} \left[\frac{1}{3} \times (30 + 80 + 60) \right] \text{crores} = \text{Rs.} \left(\frac{170}{3} \right) \text{crores.}$$

Average exports of the three Companies X, Y and Z in 1998

$$= \text{Rs.} \left[\frac{1}{3} \times (50 + 100 + 80) \right] \text{crores} = \text{Rs.} \left(\frac{230}{3} \right) \text{crores.}$$

$$\text{Difference} = \text{Rs.} \left[\left(\frac{230}{3} \right) - \left(\frac{170}{3} \right) \right] \text{crores}$$

$$= \text{Rs.} \left(\frac{60}{3} \right) \text{crores}$$

$$= \text{Rs.} 20 \text{ crores.}$$

5. In how many of the given years, were the exports from Company Z more than the average annual exports over the given years?

- (A) 2
- (B) 3
- (C) 4
- (D) 5

Answer: Option (C)

Explanation:

Average annual exports of Company Z during the given period

$$= \frac{1}{7} \times (60 + 90 + 120 + 90 + 60 + 80 + 100)$$

$$= \text{Rs.} \left(\frac{600}{7} \right) \text{crores}$$

$$= \text{Rs.} 85.71 \text{ crores.}$$

From the analysis of graph the exports of Company Z are more than the average annual exports of Company Z (i.e., Rs. 85.71 crores) during the years 1994, 1995, 1996 and 1999, i.e., during 4 of the given years.

► Directions to Solve

The following line graph gives the ratio of the amounts of imports by a company to the amount of exports from that company over the period from 1995 to 2001.

Ratio of Value of Imports to Exports by a Company Over the Years.



1. If the imports in 1998 was Rs. 250 crores and the total exports in the years 1998 and 1999 together was Rs. 500 crores, then the imports in 1999 was ?

- (A) Rs. 250 crores
- (B) Rs. 300 crores
- (C) Rs. 357 crores
- (D) Rs. 420 crores

Answer: Option (D)

Explanation:

The ratio of imports to exports for the years 1998 and 1999 are 1.25 and 1.40 respectively.

Let the exports in the year 1998 = Rs. x crores.

Then, the exports in the year 1999 = Rs. $(500 - x)$ crores.

$$\therefore 1.25 = \frac{250}{x} \Rightarrow x = \frac{250}{1.25} = 200 \quad [\text{Using ratio for 1998}]$$

Thus, the exports in the year 1999 = Rs. $(500 - 200)$ crores = Rs. 300 crores.

Let the imports in the year 1999 = Rs. y crores.

$$\text{Then, } 1.40 = \frac{y}{300} \Rightarrow y = (300 \times 1.40) = 420.$$

\therefore Imports in the year 1999 = Rs. 420 crores.

2. The imports were minimum proportionate to the exports of the company in the year ?

- (A) 1995
- (B) 1996
- (C) 1997
- (D) 2000

Answer: Option (C)

Explanation:

The imports are minimum proportionate to the exports implies that the ratio of the value of imports to exports has the minimum value.

Now, this ratio has a minimum value 0.35 in 1997, i.e., the imports are minimum proportionate to the exports in 1997.

3. What was the percentage increase in imports from 1997 to 1998 ?

- (A) 72
- (B) 56
- (C) 28
- (D) Data inadequate

Answer: Option (D)

Explanation:

The graph gives only the ratio of imports to exports for different years. To find the percentage increase in imports from 1997 to 1998, we require more details such as the value of imports or exports during these years.

Hence, the data is inadequate to answer this question.

4. If the imports of the company in 1996 was Rs. 272 crores, the exports from the company in 1996 was ?

- (A) Rs. 370 crores
- (B) Rs. 320 crores
- (C) Rs. 280 crores
- (D) Rs. 275 crores

Answer: Option (B)

Explanation:

Ratio of imports to exports in the year 1996 = 0.85.

Let the exports in 1996 = Rs. x crores.

$$\text{Then, } \frac{272}{x} = 0.85 \Rightarrow x = \frac{272}{0.85} = 320.$$

\therefore Exports in 1996 = Rs. 320 crores.

5. In how many of the given years were the exports more than the imports ?

- (A) 1
- (B) 2
- (C) 3
- (D) 4

Answer: Option (D)

Explanation:

The exports are more than the imports imply that the ratio of value of imports to exports is less than 1.

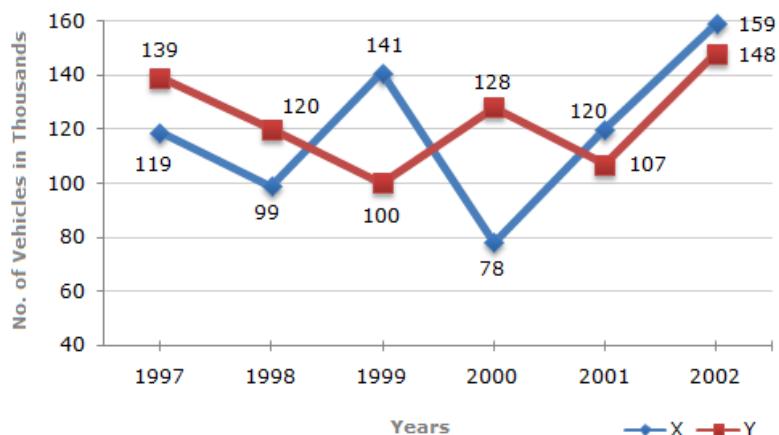
Now, this ratio is less than 1 in years 1995, 1996, 1997 and 2000.

Thus, there are four such years.

► Directions to Solve

Study the following line graph and answer the questions based on it.

Number of Vehicles Manufactured by Two companies over the Years (Number in Thousands)



1. What is the difference between the number of vehicles manufactured by Company Y in 2000 and 2001 ?

- (A) 50000
- (B) 42000
- (C) 33000
- (D) 21000

Answer: Option (D)

Explanation:

Required difference = $(128000 - 107000) = 21000$.

2. What is the difference between the total productions of the two Companies in the given years ?

- (A) 19000
- (B) 22000
- (C) 26000
- (D) 28000

Answer: Option (C)

Explanation:

From the line-graph it is clear that the productions of Company X in the years 1997, 1998, 1999, 2000, 2001 and 2002 are 119000, 99000, 141000, 78000, 120000 and 159000 and those of Company Y are 139000, 120000, 100000, 128000, 107000 and 148000 respectively.

Total production of Company X from 1997 to 2002

$$\begin{aligned} &= 119000 + 99000 + 141000 + 78000 + 120000 + 159000 \\ &= 716000. \end{aligned}$$

and total production of Company Y from 1997 to 2002

$$\begin{aligned} &= 139000 + 120000 + 100000 + 128000 + 107000 + 148000 \\ &= 742000. \end{aligned}$$

Difference = $(742000 - 716000) = 26000$.

3. What is the average numbers of vehicles manufactured by Company X over the given period ? (rounded off to nearest integer)

- (A) 119333
- (B) 113666
- (C) 112778
- (D) 111223

Answer: Option (A)

Explanation:

Average number of vehicles manufactured by Company X

$$\begin{aligned} &= \frac{1}{6} \times (119000 + 99000 + 141000 + 78000 + 120000 + 159000) \\ &= 119333. \end{aligned}$$

4. In which of the following years, the difference between the productions of Companies X and Y was the maximum among the given years ?

- (A) 1997
- (B) 1998
- (C) 1999
- (D) 2000

Answer: Option (D)

Explanation:

The difference between the productions of Companies X and Y in various years are:

For 1997 $(139000 - 119000) = 20000$.

For 1998 $(120000 - 99000) = 21000$.

For 1999 $(141000 - 100000) = 41000$.

For 2000 $(128000 - 78000) = 50000$.

For 2001 $(120000 - 107000) = 13000$.

For 2002 $(159000 - 148000) = 11000$.

Clearly, maximum difference was in 2000.

5. The production of Company Y in 2000 was approximately what percent of the production of Company X in the same year ?

- (A) 173
- (B) 164
- (C) 132
- (D) 97

Answer: Option (B)

Explanation:

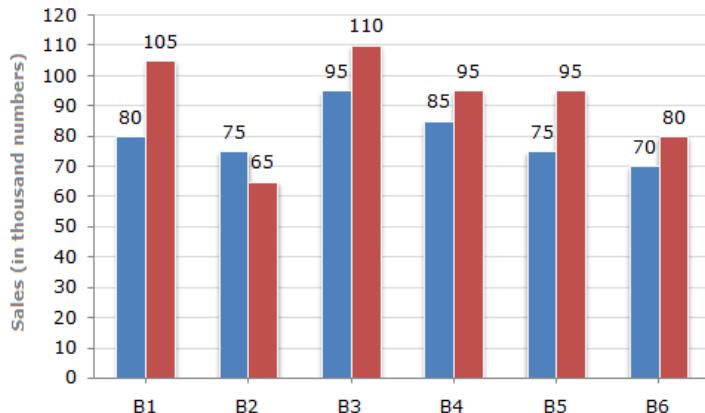
$$\text{Required percentage} = \left(\frac{128000}{78000} \times 100 \right) \% \approx 164\%.$$

Class 2: Bar Charts

► Directions to Solve

The bar graph given below shows the sales of books (in thousand number) from six branches of a publishing company during two consecutive years 2000 and 2001.

Sales of Books (in thousand numbers) from Six Branches - B1, B2, B3, B4, B5 and B6 of a publishing Company in 2000 and 2001.



1. What is the ratio of the total sales of branch B2 for both years to the total sales of branch B4 for both years?

- (A) 2:3
- (B) 3:5
- (C) 4:5
- (D) 7:9

Answer: Option (D)

Explanation:

$$\text{Required ratio} = \frac{(75 + 65)}{(85 + 95)} = \frac{140}{180} = \frac{7}{9}.$$

2. Total sales of branch B6 for both the years is what percent of the total sales of branches B3 for both the years?

- (A) 68.54%
- (B) 71.11%
- (C) 73.17%
- (D) 75.55%

Answer: Option (C)

Explanation:

$$\text{Required percentage} = \left[\frac{(70 + 80)}{(95 + 110)} \times 100 \right] \%$$

$$= \left[\frac{150}{205} \times 100 \right] \%$$

$$= 73.17\%.$$

3. What percent of the average sales of branches B1, B2 and B3 in 2001 is the average sales of branches B1, B3 and B6 in 2000?

- (A) 75%
- (B) 77.5%
- (C) 82.5%
- (D) 87.5%

Answer: Option (D)

Explanation:

Average sales (in thousand number) of branches B1, B3 and B6 in 2000

$$= \frac{1}{3} \times (80 + 95 + 70) = \left(\frac{245}{3} \right).$$

Average sales (in thousand number) of branches B1, B2 and B3 in 2001

$$= \frac{1}{3} \times (105 + 65 + 110) = \left(\frac{280}{3} \right).$$

$$\therefore \text{Required percentage} = \left[\frac{245/3}{280/3} \times 100 \right] \% = \left(\frac{245}{280} \times 100 \right) \% = 87.5\%.$$

4. What is the average sales of all the branches (in thousand numbers) for the year 2000?

- (A) 73
- (B) 80
- (C) 83
- (D) 88

Answer: Option (B)

Explanation:

Average sales of all the six branches (in thousand numbers) for the year 2000

$$\begin{aligned} &= \frac{1}{6} \times [80 + 75 + 95 + 85 + 75 + 70] \\ &= 80. \end{aligned}$$

5. Total sales of branches B1, B3 and B5 together for both the years (in thousand numbers) is?

- (A) 250
- (B) 310
- (C) 435
- (D) 560

Answer: Option (D)

Explanation:

Total sales of branches B1, B3 and B5 together for both the years (in thousand numbers)

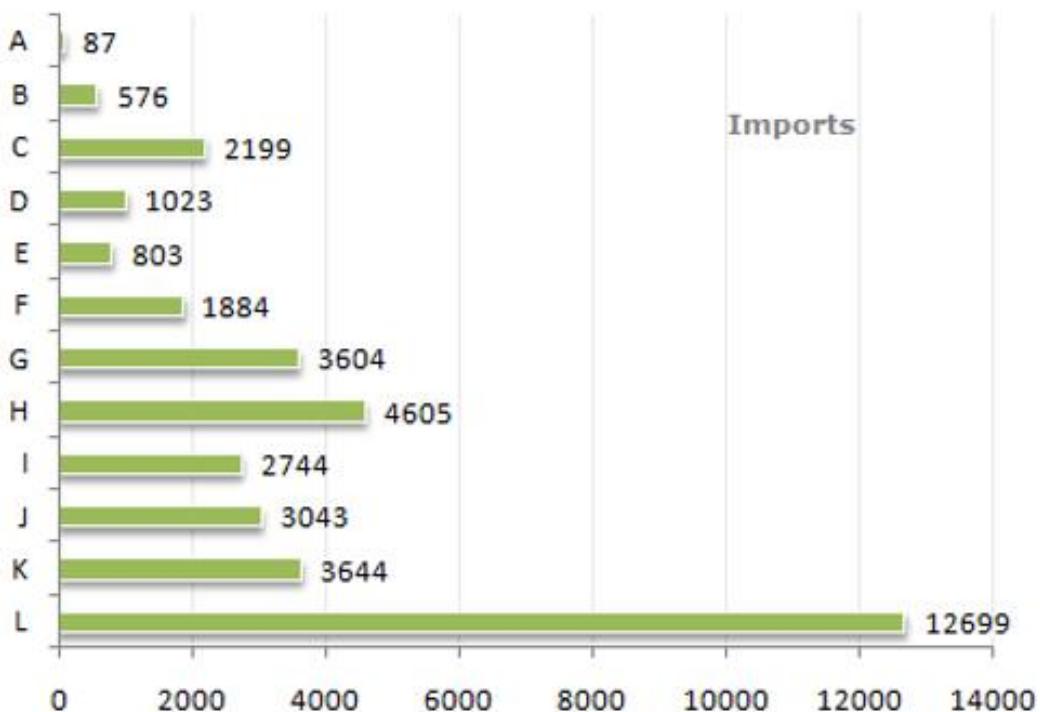
$$= (80 + 105) + (95 + 110) + (75 + 95)$$

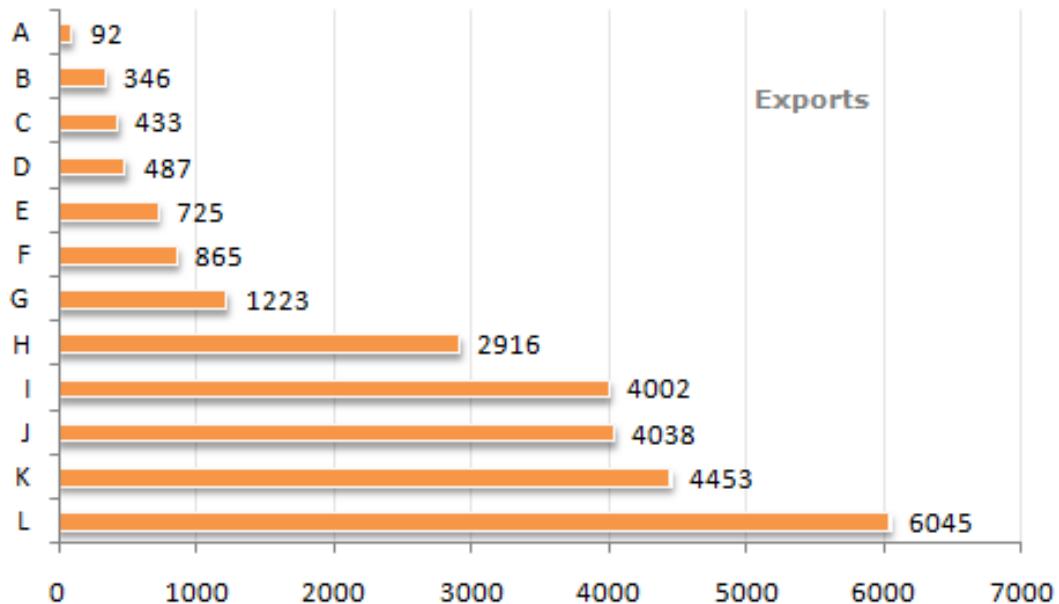
$$= 560.$$

► Directions to Solve

Study the following bar charts and answer the questions.

Foreign Trade (Imports and Exports) by countries for the year (1993 - 1994)





1. The ratio of the maximum exports to the minimum imports was closest to ?

- (A) 64
- (B) 69
- (C) 74
- (D) 79

Answer: Option (B)

Explanation:

The value of maximum exports = 6045.

The value of minimum imports = 87.

Therefore, the required ratio $(6045/87) = 69.48 = 69$ (approximately).

2. How many countries exhibited a trade surplus ?

- (A) 5
- (B) 4
- (C) 3
- (D) 6

Answer: Option (B)

Explanation:

Out of a total of 12 countries, 8 showed a deficit while 4 showed a surplus.

3. The total trade deficit/surplus for all the countries put together was ?

- (A) 11286 surplus
- (B) 11286 deficit
- (C) 10286 deficit
- (D) None of these

Answer: Option (B)

Explanation:

4. The highest trade deficit was shown by which country ?

- (A) C
- (B) G
- (C) H
- (D) L

Answer: Option (D)

Explanation:

Visually its clear that L has the highest trade deficit.

5. The ratio of Exports to Imports was highest for which country ?

- (A) A
- (B) I
- (C) J
- (D) K

Answer: Option (B)

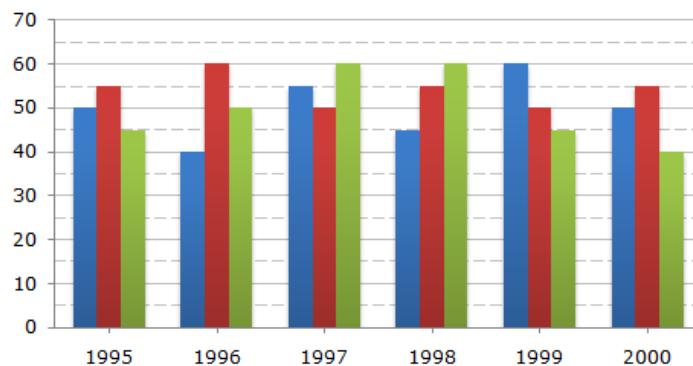
Explanation:

I has a ratio of $4002/2744 = 1.45$, which is the highest.

► Directions to Solve

A soft drink company prepares drinks of three different flavours - X, Y and Z. The production of three flavours over a period of six years has been expressed in the bar graph provided below.

Production of Three Different Flavours X, Y and Z by a Company over the years (in lakh bottles)



1. The total production of flavour Z in 1997 and 1998 is what percentage of the total production of flavour X in 1995 and 1996?

- (A) 96.67%
- (B) 102.25%
- (C) 115.57%
- (D) 133.33%

Answer: Option (D)

Explanation:

$$\text{Required percentage} = \left[\frac{(60 + 60)}{(50 + 40)} \times 100 \right] \%$$

$$= \left[\frac{120}{90} \times 100 \right] \%$$

$$= 133.33\%.$$

2. For which flavour was the average annual production maximum in the given period?

- (A) X only
- (B) Y only
- (C) Z only
- (D) X and Y

Answer: Option (B)

Explanation:

Average annual productions over the given period for various flavours are:

$$\text{For Flavour X} = \left[\frac{1}{6} \times (50 + 40 + 55 + 45 + 60 + 50) \right] = 50 \text{ lakh bottles.}$$

$$\text{For Flavour Y} = \left[\frac{1}{6} \times (55 + 60 + 50 + 55 + 50 + 55) \right] = 54.17 \text{ lakh bottles.}$$

$$\text{For Flavour Z} = \left[\frac{1}{6} \times (45 + 50 + 60 + 60 + 45 + 40) \right] = 50 \text{ lakh bottles.}$$

∴ Maximum average production is for Flavour Y.

3. What is the difference between the average production of flavour X in 1995, 1996 and 1997 and the average production of flavour Y in 1998, 1999 and 2000?

- (A) 50,000 bottles
- (B) 80,000 bottles
- (C) 2,40,000 bottles
- (D) 5,00,000 bottles

Answer: Option (D)

Explanation:

Average production of flavour X in 1995, 1996 and 1997

$$\begin{aligned} &= \left[\frac{1}{3} \times (50 + 40 + 55) \right] \\ &= \left(\frac{145}{3} \right) \text{ lakh bottles.} \end{aligned}$$

Average production of flavour Y in 1998, 1999 and 2000

$$= \left[\frac{1}{3} \times (55 + 50 + 55) \right]$$

$$= \left(\frac{160}{3} \right) \text{ lakh bottles.}$$

$$\therefore \text{Difference} = \left(\frac{160}{3} - \frac{145}{3} \right)$$

$$= \frac{15}{3}$$

$$= 5 \text{ lakh bottles}$$

$$= 5,00,000 \text{ bottles.}$$

4. What was the approximate decline in the production of flavour Z in 2000 as compared to the production in 1998?

- (A) 50%
- (B) 42%
- (C) 33%
- (D) 25%

Answer: Option (C)

Explanation:

Percentage decline in the production of flavour Z in 2000 as compared to the production in 1998

$$= \left[\frac{(60 - 40)}{60} \times 100 \right] \%$$

$$= \left(\frac{20}{60} \times 100 \right) \%$$

$$= 33.33\%$$

$$\approx 33\%.$$

5. For which of the following years the percentage of rise/fall in production from the previous year is the maximum for the flavour Y?

- (A) 1996
- (B) 1997
- (C) 1998
- (D) 1999

Answer: Option (B)

Explanation:

The percentage rise/fall in production from the previous year for flavour Y during various years are:

$$\text{In 1996} = \left[\frac{(60 - 55)}{55} \times 100 \right] \% = 9.09\% \text{ (increase)}$$

$$\text{In 1997} = \left[\frac{(60 - 50)}{60} \times 100 \right] \% = 16.67\% \text{ (decrease)}$$

$$\text{In 1998} = \left[\frac{(55 - 50)}{55} \times 100 \right] \% = 10\% \text{ (increase)}$$

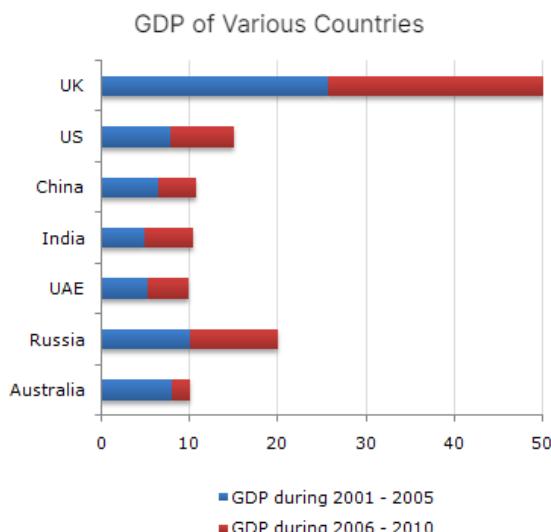
$$\text{In 1999} = \left[\frac{(55 - 50)}{55} \times 100 \right] \% = 9.09\% \text{ (decrease)}$$

$$\text{In 2000} = \left[\frac{(55 - 50)}{50} \times 100 \right] \% = 10\% \text{ (increase)}$$

∴ Maximum change is decrease of 16.67% during 1997.

► Directions to Solve

The following bar chart represents the GDP of different countries during the half decades 2001 - 2005 and 2006 - 2010. All figures are in Rs. billion.



1. Which of the countries listed below accounts for the maximum GDP during the half decade 2006 to 2010 ?

- (A) UAE
- (B) US
- (C) India
- (D) China

Answer: Option (B)

Explanation:

It's clear that US is the highest amongst the given options.

2. The GDP of UAE is what fraction of GDP of the UK for the decade (approximately) ?

- (A) (1/4)th
- (B) (1/5)th
- (C) (1/6)th
- (D) Data inadequate

Answer: Option (B)

Explanation:

$$(10/50) = 20\% = (1/5)\text{th}$$

3. Which of the countries listed below accounts for the highest GDP during the half decade 2001 to 2005 ?

- (A) Russia
- (B) China
- (C) India
- (D) UAE

Answer: Option (A)

Explanation:

It's clear that Russia is the answer.

4. Out of every Rs. 10,000 spent during the decade 2001 - 2010 approximately how much was the GDP of Russia during the half decade 2001 - 2005 ?

- (A) Rs. 700
- (B) Rs. 1,400
- (C) Rs. 2,800
- (D) None of these

Answer: Option (D)

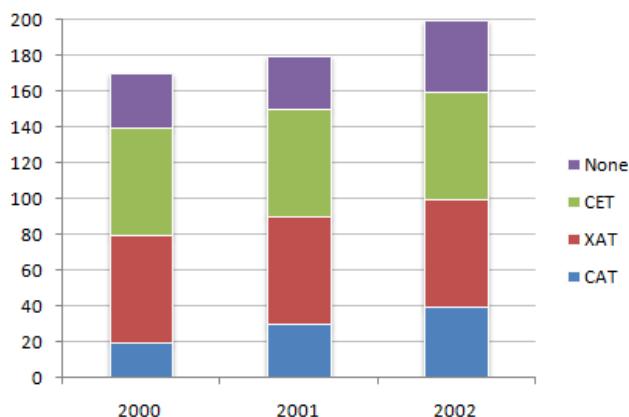
Explanation:

Russia will account for 10 out of 125, i.e, 8% of the total, i.e, 800 out of 10,000 (approximately values based on visual interpretation).

► Directions to Solve

The following chart represents the number of students who passed the CAT exam or the XAT exam or the CET exam or None of these exams. (Assume that there are no students who passed more than one exam.)

Number of students who qualified CAT/XAT/CET Exams



1. Which year showed the best result in MBA entrance exams (in terms of percentage of students who cleared) ?

- (A) 2000
- (B) 2001
- (C) 2002
- (D) Cannot be determined

Answer: Option (B)

Explanation:

Compare the respective pass percentage for three years : 2000, 2001 and 2002

$$= (140 \times 100)/170 < (150 \times 100)/180 \text{ and } (150 \times 100)/180 > (160 \times 100)/200$$

$$= 82.35\% < 83.33\% \text{ and } 83.33\% > 80\%$$

2. What was the percentage of students who succeeded in at least one of three exams in 2000 ?

- (A) 82.4 %
- (B) 82.8 %
- (C) 82.35 %
- (D) 83.3 %

Answer: Option (C)

Explanation:

Total percentage of students who succeeded in at least one of three exams in 2000 = $(140 \times 100)/170 = 82.35\%$

3. What is the percentage increase in the number of students in 2002 over 2000 ?

- (A) 30 %
- (B) 17.64 %
- (C) 117.6 %
- (D) 85 %

Answer: Option (B)

Explanation:

Total percentage increase in the number of students in 2002 over 2000 is = $(30 \times 100)/170 = 17.64\%$

4. What is the percentage of students who cleared CAT in 2000 ?

- (A) 19.56 %
- (B) 12.65 %
- (C) 14.28 %
- (D) 11.76 %

Answer: Option (D)

Explanation:

Total percentage of students who cleared CAT in 2000 = $(20 \times 100)/170 = 11.76\%$

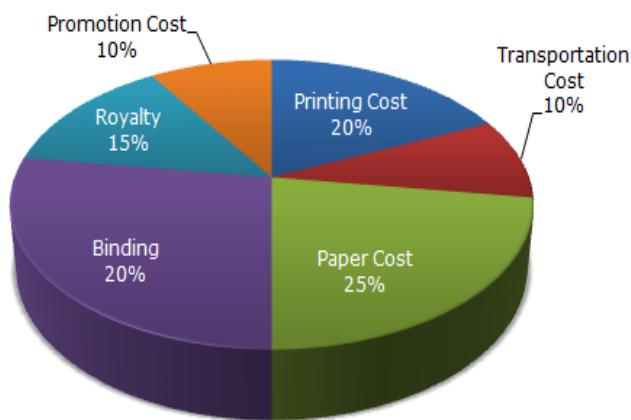
Class 3: Pie Chart

Type-1

► Directions to Solve

The following pie-chart shows the percentage distribution of the expenditure incurred in publishing a book. Study the pie-chart and the answer the questions based on it.

Various Expenditures (in percentage) Incurred in Publishing a Book



1. If for a certain quantity of books, the publisher has to pay Rs. 30,600 as printing cost, then what will be amount of royalty to be paid for these books?
 A Rs. 19,450
 B Rs. 21,200
 C Rs. 22,950
 D Rs. 26,150

Answer: Option C

Explanation:

Let the amount of Royalty to be paid for these books be Rs. r .

$$\text{Then, } 20 : 15 = 30600 : r \Rightarrow r = \text{Rs.} \left(\frac{30600 \times 15}{20} \right) = \text{Rs.} 22,950.$$

2. What is the central angle of the sector corresponding to the expenditure incurred on Royalty?

- (A) 15°
- (B) 24°
- (C) 54°
- (D) 48°

Answer: Option (C)

Explanation:

Central angle corresponding to Royalty = (15% of 360) $^\circ$

$$\begin{aligned} &= \left(\frac{15}{100} \times 360 \right)^\circ \\ &= 54^\circ. \end{aligned}$$

3. The price of the book is marked 20% above the C.P. If the marked price of the book is Rs. 180, then what is the cost of the paper used in a single copy of the book?

- (A) Rs. 36
- (B) Rs. 37.50
- (C) Rs. 42
- (D) Rs. 44.25

Answer: Option (B)

Explanation:

Clearly, marked price of the book = 120% of C.P.

Also, cost of paper = 25% of C.P

Let the cost of paper for a single book be Rs. n .

$$\text{Then, } 120 : 25 = 180 : n \Rightarrow n = \text{Rs.} \left(\frac{25 \times 180}{120} \right) = \text{Rs.} 37.50.$$

4. If 5500 copies are published and the transportation cost on them amounts to Rs. 82500, then what should be the selling price of the book so that the publisher can earn a profit of 25%?

- (A) Rs. 187.50
- (B) Rs. 191.50
- (C) Rs. 175
- (D) Rs. 180

Answer: Option (A)

Explanation:

For the publisher to earn a profit of 25%, S.P. = 125% of C.P.

Also Transportation Cost = 10% of C.P.

Let the S.P. of 5500 books be Rs. x .

$$\text{Then, } 10 : 125 = 82500 : x \Rightarrow x = \text{Rs.} \left(\frac{125 \times 82500}{10} \right) = \text{Rs.} 1031250.$$

$$\therefore \text{S.P. of one book} = \text{Rs.} \left(\frac{1031250}{5500} \right) = \text{Rs.} 187.50.$$

5. Royalty on the book is less than the printing cost by:

- (A) 5%
- (B) $33\frac{1}{5}\%$
- (C) 20%
- (D) 25%

Answer: Option (D)

Explanation:

Printing Cost of book = 20% of C.P.

Royalty on book = 15% of C.P.

Difference = (20% of C.P.) - (15% of C.P.) = 5% of C.P.

$$\therefore \text{Percentage difference} = \left(\frac{\text{Difference}}{\text{Printing Cost}} \times 100 \right) \%$$

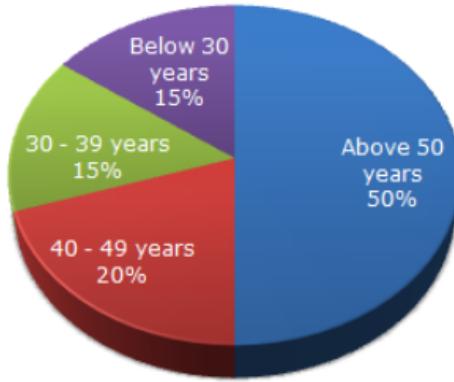
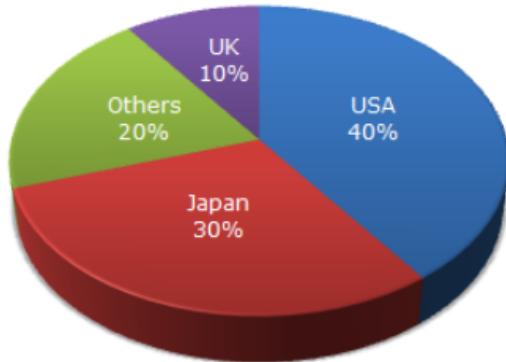
$$= \left(\frac{5\% \text{ of C.P.}}{\text{Printing Cost}} \times 100 \right) \% = 25\%.$$

Type-2

► Directions to Solve

The following pie charts exhibit the distribution of the overseas tourist traffic from India. The two charts shows the tourist distribution by country and the age profiles of the tourists respectively.

Distribution of Overseas Tourist Traffic from India.



1. What percentage of Indian tourist went to either USA or UK ?

- (A) 40 %
- (B) 50 %
- (C) 60 %
- (D) 70 %

Answer: Option (B)

Explanation:

$(40+10) = 50\% \text{ (from first chart)}$

2. The ratio of the number of Indian tourists that went to USA to the number of Indian tourists who were below 30 years of age is ?

- (A) 2:1
- (B) 8:3
- (C) 3:8
- (D) Cannot be determined

Answer: Option (B)

Explanation:

$$40:15 = 8:3$$

3. If amongst other countries, Switzerland accounted for 25% of the Indian tourist traffic, and it is known from official Swiss records that a total of 25 lakh Indian tourists had gone to Switzerland during the year, then find the number of 30-39 year old Indian tourists who went abroad in that year ?

- (A) 18.75 lakh
- (B) 25 lakh
- (C) 50 lakh
- (D) 75 lakh

Answer: Option (D)

Explanation:

Tourist traffic from other countries to Swiz is 20%.

Amongst this 20%, 25% of traffic from India.

So, 25% of 20% = 5% corresponds to the Indian traffic in Switzerland.

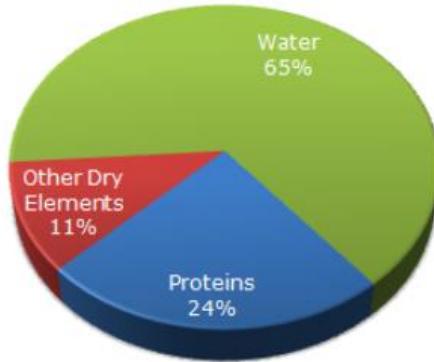
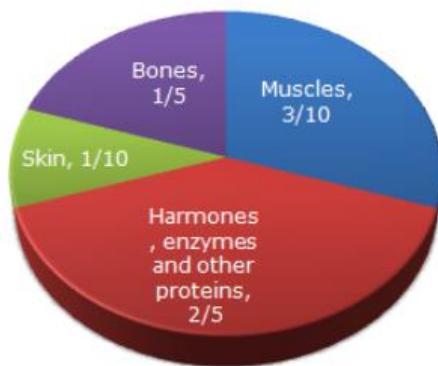
5 % corresponds to Switzerland's 25 lakh. Hence 15% will be 75 lakh.

Type-3

► Directions to Solve

The following pie chart give the information about the distribution of weight in the human body according to different kinds of components. Study the pie charts and answer the question.

Distribution of Weight in Human Body



1. What percentage of proteins of the human body is equivalent to the weight of its skin ?
 A 41.66 %
 B 43.33 %
 C 44.44 %
 D Cannot be determined

Answer: Option A

Explanation:

$$\text{Total percentage} = (10 / 24) \times 100 = 41.6666667 \%$$

3. What is the ratio of the distribution of proteins in the muscles to that of the distribution of proteins in the bones ?

- (A) 2:1
- (B) 2:3
- (C) 3:2
- (D) Cannot be determined

Answer: Option (D)

Explanation:

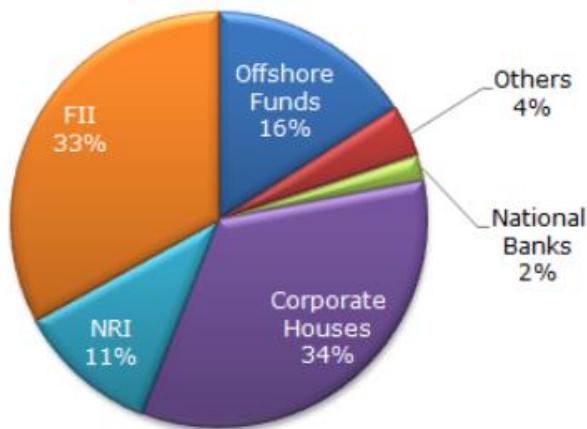
It cannot be determined since the respective distributions are not known.

Type-4

► Directions to Solve

The following pie chart shows the amount of subscriptions generated for India Bonds from different categories of investors.

Subscriptions Generated for India Bonds



1. In the corporate sector, approximately how many degrees should be there in the central angle ?

- (A) 120
- (B) 121
- (C) 122
- (D) 123

Answer: Option (C)

Explanation:

$34 \times 3.6 = 122.4$ (since 1% = 3.6 degrees)

2. If the investment by NRI's are Rs 4,000 crore, then the investments by corporate houses and FII's together is:

- (A) 24,000 crore
- (B) 24,363 crore
- (C) 25,423 crore
- (D) 25,643 crore

Answer: Option (B)

Explanation:

$$(67/11) \times 4000 = 24\ 363.6364$$

3. What percentage of the total investment is coming from FII's and NRI's ?

- (A) 33 %
- (B) 11 %
- (C) 44 %
- (D) 22 %

Answer: Option (C)

Explanation:

$$(33 + 11) = 44$$

4. If the total investment other than by FII and corporate houses is Rs 335,000 crore, then the investment by NRI's and Offshore funds will be (approximately) ?

- (A) 274,100
- (B) 285,600
- (C) 293,000
- (D) Cannot be determined

Answer: Option (A)

Explanation:

Investment other than NRI and corporate houses is $33\% = 335000$. Also, investment by offshore funds and NRI's is equal to 27%.

$$\text{Hence, } 27 \times 335,000/33 = 274\ 090.909$$

5. If the total investment flows from FII's were to be doubled in the next year and the investment flows from all other sources had remained constant at their existing levels for this year, then what would be the proportion of FII investment in the total investment into India Bonds next year (in US \$ millions) ?

- (A) 40 %
- (B) 50 %
- (C) 60 %
- (D) 70 %

Answer: Option (B)

Explanation:

FII's currently account for 33 out of 100.

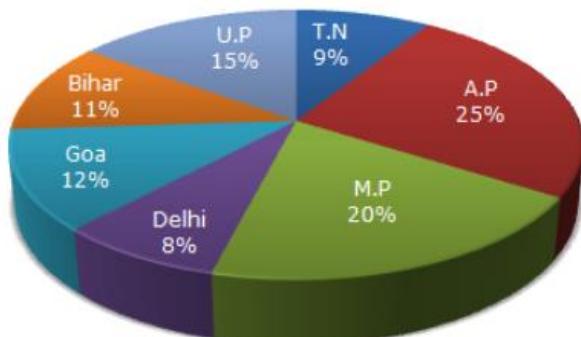
If their value is doubled and all other investments are kept constant then their new value would be 66 out of 133
= approximately equal to 50%

Type-5

► Directions to Solve

Study the following graph and the table and answer the questions given below.

Data of different states regarding population of states in the year 1998



Total population of the given States = 3276000.

States	Sex and Literacy wise Population Ratio				
	Sex		Literacy		
	M	F	Literate	Illiterate	
A.P	5	3	2	7	
M.P	3	1	1	4	
Delhi	2	3	2	1	
Goa	3	5	3	2	
Bihar	3	4	4	1	
U.P.	3	2	7	2	
T.N.	3	4	9	4	

1. What will be the percentage of total number of males in U.P., M.P. and Goa together to the total population of all the given states?

- (A) 25%
- (B) 27.5%
- (C) 28.5%
- (D) 31.5%

Answer: Option (C)

Explanation:

$$\text{Number of males in U.P} = \left[\frac{3}{5} \text{ of } (15\% \text{ of } N) \right] = \frac{3}{5} \times \frac{15}{100} \times N = 9 \times \frac{N}{100}.$$

where $N = 3276000$.

$$\text{Number of males in M.P} = \left[\frac{3}{4} \text{ of } (20\% \text{ of } N) \right] = \frac{3}{4} \times \frac{20}{100} \times N = 15 \times \frac{N}{100}.$$

$$\text{Number of males in Goa} = \left[\frac{3}{8} \text{ of } (12\% \text{ of } N) \right] = \frac{3}{8} \times \frac{12}{100} \times N = 4.5 \times \frac{N}{100}.$$

$$\therefore \text{Total number of males in these three states} = (9 + 15 + 4.5) \times \frac{N}{100}$$

$$= \left(28.5 \times \frac{N}{100} \right).$$

$$\therefore \text{Required Percentage} = \left[\frac{\left(28.5 \times \frac{N}{100} \right) \times 100}{N} \right] \% = 28.5\%.$$

2. What was the total number of illiterate people in A.P. and M.P. in 1998?

- (A) 876040
- (B) 932170
- (C) 981550
- (D) 1161160

Answer: Option (D)

Explanation:

$$\text{No. of illiterate people in A.P.} = \left[\frac{7}{9} \text{ of } (25\% \text{ of } 3276000) \right] = 637000.$$

$$\text{No. of illiterate people in M.P.} = \left[\frac{4}{5} \text{ of } (20\% \text{ of } 3276000) \right] = 524160.$$

$$\therefore \text{Total number} = (637000 + 524160) = 1161160.$$

3. What is the ratio of the number of females in T.N. to the number of females in Delhi?

- (A) 7 : 5
- (B) 9 : 7
- (C) 13 : 11
- (D) 15 : 14

Answer: Option (D)

Explanation:

$$\frac{4}{7} \text{ of } (9\% \text{ of } 3276000)$$

$$\text{Required ratio} = \frac{\frac{4}{7} \text{ of } (9\% \text{ of } 3276000)}{\frac{3}{5} \text{ of } (8\% \text{ of } 3276000)}$$

$$\begin{aligned}
 &= \frac{\left(\frac{4}{7} \times 9\right)}{\left(\frac{3}{5} \times 8\right)} \\
 &= \left(\frac{4}{7} \times 9 \times \frac{5}{3} \times \frac{1}{8}\right) \\
 &= \frac{15}{14}.
 \end{aligned}$$

4. What was the number of males in U.P. in the year 1998?

- (A) 254650
- (B) 294840
- (C) 321470
- (D) 341200

Answer: Option (B)

Explanation:

$$\begin{aligned}
 \text{Number of males in U.P.} &= \left[\frac{3}{5} \text{ of } (15\% \text{ of } 3276000) \right] \\
 &= \frac{3}{5} \times \frac{15}{100} \times 3276000 \\
 &= 294840.
 \end{aligned}$$

5. If in the year 1998, there was an increase of 10% in the population of U.P. and 12% in the population of M.P. compared to the previous year, then what was the ratio of populations of U.P. and M.P. in 1997?

- (A) 42 : 55
- (B) 48 : 55
- (C) 7 : 11
- (D) 4 : 5

Answer: Option (A)

Explanation:

Let x be the population of U.P. in 1997. Then,

$$\text{Population of U.P. in 1998} = 110\% \text{ of } x = \frac{110}{100} \times x.$$

Also, let y be the population of M.P. in 1997. Then,

$$\text{Population of M.P. in 1998} = 112\% \text{ of } y = \frac{112}{100} \times y.$$

$$\text{Ratio of populations of U.P. and M.P. in 1998} = \frac{\left(\frac{110}{100} \times x\right)}{\left(\frac{112}{100} \times y\right)} = \frac{110x}{112y}$$

From the pie-chart, this ratio is $\frac{15}{20}$.

$$\therefore \frac{110x}{112y} = \frac{15}{20} \Rightarrow \frac{x}{y} = \frac{15}{20} \times \frac{112}{110} = \frac{42}{55}.$$

Thus, ratio of populations of U.P. and M.P. in 1997 = $x:y = 42:55$.

Class 4: Table

Type-1

► Directions to Solve

Study the following table and answer the questions based on it.

Expenditures of a Company (in Lakh Rupees) per Annum Over the given Years.

Year	Item of Expenditure				
	Salary	Fuel and Transport	Bonus	Interest on Loans	Taxes
1998	288	98	3.00	23.4	83
1999	342	112	2.52	32.5	108
2000	324	101	3.84	41.6	74
2001	336	133	3.68	36.4	88
2002	420	142	3.96	49.4	98

1. What is the average amount of interest per year which the company had to pay during this period?

- (A) Rs. 32.43 lakhs
- (B) Rs. 33.72 lakhs
- (C) Rs. 34.18 lakhs
- (D) Rs. 36.66 lakhs

Answer: Option (D)

Explanation:

Average amount of interest paid by the Company during the given period

$$\begin{aligned} &= \text{Rs. } \left[\frac{23.4 + 32.5 + 41.6 + 36.4 + 49.4}{5} \right] \text{ lakhs} \\ &= \text{Rs. } \left[\frac{183.3}{5} \right] \text{ lakhs} \\ &= \text{Rs. } 36.66 \text{ lakhs.} \end{aligned}$$

2. The total amount of bonus paid by the company during the given period is approximately what percent of the total amount of salary paid during this period?

- (A) 0.1%
- (B) 0.5%
- (C) 1%
- (D) 1.25%

Answer: Option (C)

Explanation:

$$\text{Required percentage} = \left[\frac{(3.00 + 2.52 + 3.84 + 3.68 + 3.96)}{(288 + 342 + 324 + 336 + 420)} \times 100 \right] \%$$

$$= \left[\frac{17}{1710} \times 100 \right] \%$$

$$\approx 1\%.$$

3. Total expenditure on all these items in 1998 was approximately what percent of the total expenditure in 2002?

- (A) 62%
- (B) 66%
- (C) 69%
- (D) 71%

Answer: Option (C)

Explanation:

$$\text{Required percentage} = \left[\frac{(288 + 98 + 3.00 + 23.4 + 83)}{(420 + 142 + 3.96 + 49.4 + 98)} \times 100 \right] \%$$

$$= \left[\frac{495.4}{713.36} \times 100 \right] \%$$

$$\approx 69.45\%.$$

4. The total expenditure of the company over these items during the year 2000 is?

- (A) Rs. 544.44 lakhs
- (B) Rs. 501.11 lakhs
- (C) Rs. 446.46 lakhs
- (D) Rs. 478.87 lakhs

Answer: Option (A)

Explanation:

Total expenditure of the Company during 2000

$$\begin{aligned} &= \text{Rs. } (324 + 101 + 3.84 + 41.6 + 74) \text{ lakhs} \\ &= \text{Rs. } 544.44 \text{ lakhs.} \end{aligned}$$

5. The ratio between the total expenditure on Taxes for all the years and the total expenditure on Fuel and Transport for all the years respectively is approximately?

- (A) 4:7
- (B) 10:13
- (C) 15:18
- (D) 5:8

Answer: Option (B)

Explanation:

$$\text{Required ratio} = \left[\frac{(83 + 108 + 74 + 88 + 98)}{(98 + 112 + 101 + 133 + 142)} \right]$$

$$= \left[\frac{451}{586} \right]$$

$$= \frac{1}{1.3}$$

$$= \frac{10}{13}.$$

Type-2

► Directions to Solve

Study the following table and answer the questions.

Number of Candidates Appeared and Qualified in a Competitive Examination from Different States Over the Years.

State	Year									
	1997		1998		1999		2000		2001	
	App.	Qual.								
M	5200	720	8500	980	7400	850	6800	775	9500	1125
N	7500	840	9200	1050	8450	920	9200	980	8800	1020
P	6400	780	8800	1020	7800	890	8750	1010	9750	1250
Q	8100	950	9500	1240	8700	980	9700	1200	8950	995
R	7800	870	7600	940	9800	1350	7600	945	7990	885

1. Total number of candidates qualified from all the states together in 1997 is approximately what percentage of the total number of candidates qualified from all the states together in 1998?

- (A) 72%
- (B) 77%
- (C) 80%
- (D) 83%

Answer: Option (C)

Explanation:

$$\begin{aligned}\text{Required percentage} &= \left[\frac{(720 + 840 + 780 + 950 + 870)}{(980 + 1050 + 1020 + 1240 + 940)} \times 100 \right] \% \\ &= \left[\frac{4160}{5230} \times 100 \right] \% \\ &= 79.54\% \approx 80\%.\end{aligned}$$

2. What is the average candidates who appeared from State Q during the given years?

- (A) 8700
- (B) 8760
- (C) 8990
- (D) 8920

Answer: Option (C)

Explanation:

$$\text{Required average} = \frac{8100 + 9500 + 8700 + 9700 + 8950}{5}$$

$$= \frac{44950}{5}$$

$$= 8990.$$

3. In which of the given years the number of candidates appeared from State P has maximum percentage of qualified candidates?

- (A) 1997
- (B) 1998
- (C) 1999
- (D) 2001

Answer: Option (D)

Explanation:

The percentages of candidates qualified to candidates appeared from State P during different years are:

$$\text{For 1997 } \left(\frac{780}{6400} \times 100 \right) \% = 12.19\%.$$

$$\text{For 1998 } \left(\frac{1020}{8800} \times 100 \right) \% = 11.59\%.$$

$$\text{For 1999 } \left(\frac{890}{7800} \times 100 \right) \% = 11.41\%.$$

$$\text{For 2000 } \left(\frac{1010}{8750} \times 100 \right) \% = 11.54\%.$$

$$\text{For 2001 } \left(\frac{1250}{9750} \times 100 \right) \% = 12.82\%.$$

∴ Maximum percentage is for the year 2001.

4. What is the percentage of candidates qualified from State N for all the years together, over the candidates appeared from State N during all the years together?

- (A) 12.36%
- (B) 12.16%
- (C) 11.47%
- (D) 11.15%

Answer: Option (D)

Explanation:

$$\text{Required percentage} = \left[\frac{(840 + 1050 + 920 + 980 + 1020)}{(7500 + 9200 + 8450 + 9200 + 8800)} \times 100 \right] \%$$

$$= \left[\frac{4810}{43150} \times 100 \right] \%$$

$$= 11.15\%$$

5. The percentage of total number of qualified candidates to the total number of appeared candidates among all the five states in 1999 is?

- (A) 11.49%
- (B) 11.84%
- (C) 12.21%
- (D) 12.57%

Answer: Option (B)

Explanation:

$$\text{Required percentage} = \left[\frac{(850 + 920 + 890 + 980 + 1350)}{(7400 + 8450 + 7800 + 8700 + 9800)} \times 100 \right] \%$$

$$= \left[\frac{4990}{42150} \times 100 \right] \%$$

$$= 11.84\%.$$

Type-3

► Directions to Solve

Study the following table and answer the questions based on it.

Number of Candidates Appeared, Qualified and Selected in a Competitive Examination from Five States Delhi, H.P, U.P, Punjab and Haryana Over the Years 1994 to 1998

Year	Delhi			H.P			U.P			Punjab			Haryana		
	App	Qual	Sel	App	Qual	Sel	App	Qual	Sel	App	Qual	Sel	App	Qual	Sel
1997	8000	850	94	7800	810	82	7500	720	78	8200	680	85	6400	700	75
1998	4800	500	48	7500	800	65	5600	620	85	6800	600	70	7100	650	75
1999	7500	640	82	7400	560	70	4800	400	48	6500	525	65	5200	350	55
2000	9500	850	90	8800	920	86	7000	650	70	7800	720	84	6400	540	60
2001	9000	800	70	7200	850	75	8500	950	80	5700	485	60	4500	600	75

1. For which state the average number of candidates selected over the years is the maximum?

- (A) Delhi
- (B) H.P
- (C) U.P
- (D) Punjab

Answer: Option (A)

Explanation:

The average number of candidates selected over the given period for various states are:

$$\text{For Delhi} = \frac{94 + 48 + 82 + 90 + 70}{5} = \frac{384}{5} = 76.8.$$

$$\text{For H.P.} = \frac{82 + 65 + 70 + 86 + 75}{5} = \frac{378}{5} = 75.6.$$

$$\text{For U.P.} = \frac{78 + 85 + 48 + 70 + 80}{5} = \frac{361}{5} = 72.2.$$

$$\text{For Punjab} = \frac{85 + 70 + 65 + 84 + 60}{5} = \frac{364}{5} = 72.8.$$

$$\text{For Haryana} = \frac{75 + 75 + 55 + 60 + 75}{5} = \frac{340}{5} = 68.$$

Clearly, this average is maximum for Delhi.

2. The percentage of candidates qualified from Punjab over those appeared from Punjab is highest in the year?

(A) 1997

(B) 1998

(C) 1999

(D) 2000

Answer: Option (D)

Explanation:

The percentages of candidates qualified from Punjab over those appeared from Punjab during different years are:

$$\text{For 1997} = \left(\frac{680}{8200} \times 100 \right)\% = 8.29\%.$$

$$\text{For 1998} = \left(\frac{600}{6800} \times 100 \right)\% = 8.82\%.$$

$$\text{For 1999} = \left(\frac{525}{6500} \times 100 \right)\% = 8.08\%.$$

$$\text{For 2000} = \left(\frac{720}{7800} \times 100 \right)\% = 9.23\%.$$

$$\text{For 2001} = \left(\frac{485}{5700} \times 100 \right)\% = 8.51\%.$$

Clearly, this percentage is highest for the year 2000.

3. In the year 1997, which state had the lowest percentage of candidates selected over the candidates appeared?

(A) Delhi

(B) H.P.

(C) U.P.

(D) Punjab

Answer: Option (D)

Explanation:

The percentages of candidates selected over the candidates appeared in 1997, for various states are:

$$(i) \text{ For Delhi} = \left(\frac{94}{8000} \times 100 \right)\% = 1.175\%.$$

$$(ii) \text{ For H.P.} = \left(\frac{82}{7800} \times 100 \right)\% = 1.051\%.$$

$$(iii) \text{ For U.P.} = \left(\frac{78}{7500} \times 100 \right)\% = 1.040\%.$$

$$(iv) \text{ For Punjab} = \left(\frac{85}{8200} \times 100 \right)\% = 1.037\%.$$

$$(v) \text{ For Haryana} = \left(\frac{75}{6400} \times 100 \right)\% = 1.172\%.$$

Clearly, this percentage is lowest for Punjab.

4. The number of candidates selected from Haryana during the period under review is approximately what percent of the number selected from Delhi during this period?

(A) 79.5%

(B) 81%

(C) 84.5%

(D) 88.5%

Answer: Option (D)

Explanation:

$$\text{Required percentage} = \left[\frac{(75 + 75 + 55 + 60 + 75)}{(94 + 48 + 82 + 90 + 70)} \times 100 \right] \%$$

$$= \left[\frac{340}{384} \times 100 \right] \%$$

$$= 88.54\%$$

$$\approx 88.5\%$$

5. The percentage of candidates selected from U.P over those qualified from U.P is highest in the year?

(A) 1997

(B) 1998

(C) 1999

(D) 2001

Answer: Option (B)

Explanation:

The percentages of candidates selected from U.P. over those qualified from U.P. during different years are:

$$\text{For 1997} = \left(\frac{78}{720} \times 100 \right)\% = 10.83\%.$$

$$\text{For 1998} = \left(\frac{85}{620} \times 100 \right)\% = 13.71\%.$$

$$\text{For 1999} = \left(\frac{48}{400} \times 100 \right)\% = 12\%.$$

$$\text{For 2000} = \left(\frac{70}{650} \times 100 \right)\% = 10.77\%.$$

$$\text{For 2001} = \left(\frac{80}{950} \times 100 \right)\% = 8.42\%.$$

Clearly, this percentage is highest for the year 1998.

Type-4

► Directions to Solve

The following table gives the sales of batteries manufactured by a company over the years.

Number of Different Types of Batteries Sold by a Company Over the Years
(Numbers in Thousands)

Year	Types of Batteries					
	4AH	7AH	32AH	35AH	55AH	Total
1992	75	144	114	102	108	543
1993	90	126	102	84	126	528
1994	96	114	75	105	135	525
1995	105	90	150	90	75	510
1996	90	75	135	75	90	465
1997	105	60	165	45	120	495
1998	115	85	160	100	145	605

1. What was the approximate percentage increase in the sales of 55AH batteries in 1998 compared to that in 1992?

- (A) 28%
- (B) 31%
- (C) 33%
- (D) 34%

Answer: Option (D)

Explanation:

$$\text{Required percentage} = \left[\frac{(145 - 108)}{108} \times 100 \right] \%$$

$$= 34.26\%$$

$$\approx 34\%.$$

2. The total sales of all the seven years is the maximum for which battery?

(A) 4AH

(B) 7AH

(C) 32AH

(D) 35AH

Answer: Option (C)

Explanation:

The total sales (in thousands) of all the seven years for various batteries are:

$$\text{For 4AH} = 75 + 90 + 96 + 105 + 90 + 105 + 115 = 676$$

$$\text{For 7AH} = 144 + 126 + 114 + 90 + 75 + 60 + 85 = 694$$

$$\text{For 32AH} = 114 + 102 + 75 + 150 + 135 + 165 + 160 = 901$$

$$\text{For 35AH} = 102 + 84 + 105 + 90 + 75 + 45 + 100 = 601$$

$$\text{For 55AH} = 108 + 126 + 135 + 75 + 90 + 120 + 145 = 799.$$

Clearly, sales are maximum in case of 32AH batteries.

3. What is the difference in the number of 35AH batteries sold in 1993 and 1997?

(A) 24000

(B) 28000

(C) 35000

(D) 39000

Answer: Option (D)

Explanation:

$$\text{Required difference} = [(84 - 45) \times 1000] = 39000.$$

4. The percentage of 4AH batteries sold to the total number of batteries sold was maximum in the year?

- (A) 1994
- (B) 1995
- (C) 1996
- (D) 1997

Answer: Option (D)

Explanation:

The percentages of sales of 4AH batteries to the total sales in different years are:

$$\text{For 1992} = \left(\frac{75}{543} \times 100 \right)\% = 13.81\%.$$

$$\text{For 1993} = \left(\frac{90}{528} \times 100 \right)\% = 17.05\%.$$

$$\text{For 1994} = \left(\frac{96}{525} \times 100 \right)\% = 18.29\%.$$

$$\text{For 1995} = \left(\frac{105}{510} \times 100 \right)\% = 20.59\%.$$

$$\text{For 1996} = \left(\frac{96}{465} \times 100 \right)\% = 19.35\%.$$

$$\text{For 1997} = \left(\frac{105}{495} \times 100 \right)\% = 21.21\%.$$

$$\text{For 1998} = \left(\frac{115}{605} \times 100 \right)\% = 19.01\%.$$

Clearly, the percentage is maximum in 1997.

5. In case of which battery there was a continuous decrease in sales from 1992 to 1997?

(A) 4AH

(B) 7AH

(C) 32AH

(D) 35AH

Answer: Option (B)

Explanation:

From the table it is clear that the sales of 7AH batteries have been decreasing continuously from 1992 to 1997.
