ATMA 2017 Set A February 12 Question Paper with Solutions

Time Allowed :3 Hour	**Maximum Marks :**180	**Total questions :**180

General Instructions

Read the following instructions very carefully and strictly follow them:

1. The examination duration is 180 minutes. Manage your time effectively to attempt all questions within this period.
2. The total marks for this examination are 180. Aim to maximize your score by strategically answering each question.
3. There are 180 mandatory questions to be attempted in the General MBA paper. Ensure that all questions are answered.
4. Questions may appear in a shuffled order. Do not assume a fixed sequence and focus on each question as you proceed.
5. The marking of answers will be displayed as you answer. Use this feature to monitor your performance and adjust your strategy as needed.
6. You may mark questions for review and edit your answers later. Make sure to allocate time for reviewing marked questions before final submission.
7. Be aware of the detailed section and sub
   section guidelines provided in the exam. Understanding these will aid in effectively navigating the exam.

VERBAL SKILL

PART-A (1 to 30)

1. Patricide : Father : : Sororicide : ?

(A) Mother

(B) Human

(C) Brother

(D) Sister

Correct Answer: (D) Sister

Solution: Step 1: The term ”Patricide” refers to the act of killing one’s father. The prefix ”-cide” means ”killing of,” and when combined with ”pater” (Latin for father), it specifically refers to the killing of one’s father.

Step 2: Similarly, the term ”Sororicide” refers to the act of killing one’s sister, as ”soror” is Latin for sister.

Thus, the analogy is based on the relationship between the act of killing and the person killed.

Step 3: Therefore, the correct term related to ”Sororicide” is ”Sister.” Thus, the correct answer is ”Sister.”

Quick Tip

Remember, the suffix ”-cide” refers to the act of killing. Different prefixes specify the relationship or the target of the act (e.g., fratricide for brother, matricide for mother).

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2. Ornithology : Birds : : Entomology : ?

(A) Insects

(B) Worms

(C) Mammals

(D) Reptiles

Correct Answer: (A) Insects

Solution: Step 1: ”Ornithology” is the study of birds. It is a branch of zoology that focuses specifically on birds and their behaviors, anatomy, and classifications.

Step 2: Similarly, ”Entomology” is the scientific study of insects. The term is derived from the Greek word ”entomos,” meaning ”insect.”

Step 3: Both terms are fields of study, and they are related to animals, but each one focuses on a specific type of organism.

Thus, the correct answer is ”Insects.”

Quick Tip

Branches of zoology often end in ”-logy,” which indicates the study of a particular group of organisms.

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3. Carpenter : Furniture : : Sculptor : ?

(A) Scooter

(B) Pot

(C) Building

(D) Statue

Correct Answer: (D) Statue

Solution: Step 1: A carpenter is a person who specializes in making furniture, such as tables, chairs, cabinets, and other wooden items.

Step 2: A sculptor, on the other hand, is an artist who specializes in creating statues, often by carving or shaping materials like stone, wood, or metal.

Step 3: The analogy is based on the relationship between the profession and the object it produces.

Thus, the correct answer is ”Statue.”

Quick Tip

Focus on the professional’s primary product or output when dealing with occupation-to-object analogies.

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4. Shooting : Bullet : : Archery : ?

(A) Bow

(B) Spear

(C) Arrow

(D) Rocket

Correct Answer: (C) Arrow

Solution: Step 1: In the sport of shooting, a bullet is the projectile that is shot from a firearm.

Step 2: Similarly, in archery, an arrow is the projectile that is shot from a bow.

Step 3: The analogy focuses on the tool used for shooting and the corresponding projectile.

Thus, the correct answer is ”Arrow.”

Quick Tip

Understanding the context of the action and the tool or object primarily used is crucial in such analogies.

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5. Monkey : Chatter :: Elephant : ?

(A) Neigh

(B) Squeak

(C) Roar

(D) Trumpet

Correct Answer: (D) Trumpet

Solution: Step 1: A monkey is known for its characteristic sound, which is chatter or a chattering noise.

Step 2: An elephant, on the other hand, is known for its loud, trumpeting sound.

Step 3: The analogy compares the sound made by two animals, with the monkey’s chatter being paired with the elephant’s trumpet.

Thus, the correct answer is ”Trumpet.”

Quick Tip

When dealing with analogies involving animals and sounds, focus on the distinctive sounds typically associated with each animal.

Question 6 to 10 Directions: Fill in the blank with most appropriate word

6. Docile person is _____

(A) Hated

(B) Lovable

(C) Easily managed

(D) Sick

Correct Answer: (C) Easily managed

Solution: Step 1: The term ”docile” refers to a person who is calm, submissive, and easy to control or manage.

Step 2: A docile person is someone who can be easily directed or handled, not someone who is rebellious or hard to manage.

Step 3: Therefore, the correct answer is ”Easily managed.”

Quick Tip

Understanding the definitions of terms directly helps in selecting the correct answer for adjective-based questions.

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7. He looks at everything from a personal point of view

(A) Egoist

(B) Egotist

(C) Egomaniac

(D) Egocentric

Correct Answer: (D) Egocentric

Solution: Step 1: An ”egocentric” person is one who views everything from their own perspective, often considering their own needs and interests above others.

Step 2: While ”egoist” and ”egotist” can describe people who are self-centered, the term ”egocentric” specifically refers to someone who consistently interprets the world in relation to themselves.

Step 3: Therefore, the correct answer is ”Egocentric.”

Quick Tip

Remember, the suffix ”-centric” means centered on, which in this case, refers to self-centered.

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8. _____ means the ridiculous and miserable failure.

(A) Chimera

(B) Anomaly

(C) Blunder

(D) Fiasco

Correct Answer: (D) Fiasco

Solution: Step 1: ”Fiasco” refers to a situation or event that ends in failure, especially in a ridiculous or disastrous manner.

Step 2: ”Chimera” refers to an illusion or something that is hoped for but impossible to achieve.

Step 3: ”Anomaly” refers to something that deviates from what is standard or normal, not necessarily a failure.

Step 4: ”Blunder” is a mistake, but it does not necessarily mean a complete or spectacular failure like ”fiasco.”

Thus, the correct answer is ”Fiasco.”

Quick Tip

The term ”fiasco” often relates to events or projects that end in a significantly negative or disastrous manner.

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9. Which philosophy is expressed by a sentence, “God is nonexistent!”

(A) Theism

(B) Atheism

(C) Agnosticism

(D) Reverence

Correct Answer: (B) Atheism

Solution: Step 1: ”Theism” is the belief in the existence of God or gods.

Step 2: ”Atheism” is the lack of belief in the existence of God or gods, which directly aligns with the statement ”God is nonexistent.”

Step 3: ”Agnosticism” refers to the belief that the existence of God is unknown or unknowable, not necessarily nonexistent.

Step 4: ”Reverence” refers to a deep respect, often towards a divine being, which does not fit the context of the sentence.

Thus, the correct answer is ”Atheism.”

Quick Tip

Remember, atheism explicitly denies the existence of deities, differing from agnosticism, which is about uncertainty or indecision regarding the existence of deities.

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10. Sharpness and bitterness of the speech or temper is known as _____.

(A) Apathy

(B) Alacrity

(C) Assiduity

(D) Acrimony

Correct Answer: (D) Acrimony

Solution: Step 1: ”Acrimony” refers to bitterness or sharpness, especially in speech or temper. It describes a feeling of hostility or resentment that can be expressed through sharp language.

Step 2: ”Apathy” refers to a lack of interest or emotion, which is not related to bitterness or sharpness.

Step 3: ”Alacrity” refers to eagerness or readiness, which is also not relevant to bitterness.

Step 4: ”Assiduity” refers to diligence or constant effort, which is unrelated to bitterness or sharpness.

Thus, the correct answer is ”Acrimony.”

Quick Tip

The term ”acrimony” is useful in describing the tone of discussions where there is noticeable bitterness or harshness.

Questions 11 to 16: Comprehension

Marie was born in 1867 in Warsaw, Poland, where her father was a Professor of Physics. At an early age, she displayed a brilliant mind and a blithe personality. Her great exuberance for learning prompted her to continue with her studies after high school. She became disgruntled, however, when she learned that the university in Warsaw was closed to women. Determined to receive a higher education, she defiantly left Poland and in 1891 entered the Sorbonne, a French university, where she earned her master's degree and doctorate in physics.

Marie was fortunate to have studied at the Sorbonne with some of the greatest scientists of her day, one of whom was Pierre Curie. Marie and Pierre were married in 1895 and spent many productive years working together in the physics laboratory. A short time after they discovered radium, Pierre was killed by a horse-drawn wagon in 1906. Marie was stunned by this horrible misfortune and endured heartbreaking anguish. Despondently, she recalled their close relationship and the joy that they had shared in scientific research. The fact that she had two young daughters to raise by herself greatly increased her distress.

Curie's feeling of desolation finally began to fade when she was asked to succeed her husband as a physics professor at the Sorbonne. She was the first woman to be given a professorship at the world-famous university. In 1911 she received the Nobel Prize in chemistry for isolating radium. Although Marie Curie eventually suffered a fatal illness from her long exposure to radium, she never became disillusioned about her work. Regardless of the consequences, she had dedicated herself to science and to revealing the mysteries of the physical world.

11. Marie had a bright mind and a _____ personality.

(A) Strong

(B) Lighthearted

(C) Humorous

(D) Strange

Correct Answer: (B) Lighthearted

Solution: The passage describes Marie as having a ”blithe personality,” which is synonymous with being lighthearted.

Quick Tip

”Blithe” often means showing a casual and cheerful indifference considered to be callous or improper; in a positive sense, it aligns with lighthearted.

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12. When she learned that she could not attend the university in Warsaw, she felt _____.

(A) Hopeless

(B) Annoyed

(C) Depressed

(D) Worried

Correct Answer: (B) Annoyed

Solution: Marie became ”disgruntled” when she learned that the university in Warsaw was closed to women, which corresponds to feeling annoyed.

Quick Tip

”Disgruntled” generally refers to feeling dissatisfied and annoyed.

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13. Marie _____ by leaving Poland and travelling to France to enter the Sorbonne.

(A) Challenged authority

(B) Showed intelligence

(C) Behaved

(D) Was distressed

Correct Answer: (A) Challenged authority

Solution: Marie defiantly left Poland to study in France, representing a challenge to the authority or norms that restricted her education.

Quick Tip

Defying norms or restrictions often signifies a challenge to authority.

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14. _____ she remembered their joy together.

(A) Dejectedly

(B) Worried

(C) Tearfully

(D) Happily

Correct Answer: (A) Dejectedly

Solution: Marie recalled their past joy together ”despondently,” which aligns with doing so dejectedly.

Quick Tip

”Despondently” conveys a deep sadness or dejection.

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15. Her _____ began to fade when she returned to the Sorbonne to succeed her husband.

(A) Misfortune

(B) Anger

(C) Wretchedness

(D) Disappointment

Correct Answer: (C) Wretchedness

Solution: The passage indicates that Marie’s feeling of desolation, or wretchedness, began to fade when she was appointed as a physics professor.

Quick Tip

”Wretchedness” is a state of extreme unhappiness or misfortune, similar to desolation.

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16. Even though she became fatally ill from working with radium, Marie Curie was never _____.

(A) Troubled

(B) Worried

(C) Disappointed

(D) Sorrowful

Correct Answer: (C) Disappointed

Solution: Despite her fatal illness from exposure to radium, the passage notes that Marie Curie was never disillusioned or disappointed about her work.

Quick Tip

”Disillusioned” in this context means losing belief or disappointment in something once thought to be good or valuable.

Question 17 to 21 Directions: Fill in the blanks by choosing most appropriate option:

17. ”Excuse me. Do you know where the railway station is?” ”It is _____ the bus terminal.”

(A) Opposite of

(B) Opposed to

(C) Opposite with

(D) Opposite to

Correct Answer: (D) Opposite to

Solution: Step 1: The phrase ”opposite to” is commonly used when referring to something directly across from something else in a physical or spatial context.

Step 2: ”Opposite of” is incorrect in this context, as ”opposite of” refers to something completely different in nature, not directionally across.

Step 3: ”Opposed to” means to be in opposition to, which does not fit the spatial meaning intended in the sentence.

Step 4: ”Opposite with” is not a standard preposition phrase. Thus, the correct answer is ”opposite to.”

Quick Tip

”Opposite to” is commonly used to denote location across from something.

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18. ”It is not very cold. I don’t think we need these woollen sweaters.” ”I don’t think so, ____.”

(A) Anyway

(B) Neither

(C) Either

(D) Too

Correct Answer: (C) Either

Solution: Step 1: ”Either” is used in negative sentences to agree with a negative statement. In this case, the speaker is agreeing with the idea that they don’t need the woolen sweaters.

Step 2: ”Anyway” is used to dismiss the importance of something but does not fit the context of agreeing with a negative statement.

Step 3: ”Neither” is typically used in a context where two negative choices are being discussed, and ”too” is used to mean ”also,” which doesn’t apply here.

Thus, the correct answer is ”either.”

Quick Tip

In negative agreements, use ”either” to affirm a preceding negative statement.

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19. Abhishek was thrilled to be _____ such a beautiful and interesting lady.

(A) Introduced

(B) Introduced at

(C) Introduced with

(D) Introduced to

Correct Answer: (D) Introduced to

Solution: Step 1: The correct preposition with ”introduced” when referring to a person is ”to.”

Step 2: ”Introduced with” refers to introducing two people together, not one person to another.

Step 3: ”Introduced at” is not a common phrase when referring to meeting a person for the first time.

Thus, the correct answer is ”introduced to.”

Quick Tip

”Introduced to” is the standard form when someone is formally presented to another person.

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20. If you don’t understand the text, don’t hesitate ____.

(A) Ask a question

(B) Asking a question

(C) To ask a question

(D) To asking a question

Correct Answer: (C) To ask a question

Solution: Step 1: The correct structure after ”don’t hesitate” is ”to + verb,” as it is an infinitive form.

Step 2: ”Ask a question” is incorrect because it lacks the infinitive ”to.”

Step 3: ”To asking a question” is incorrect because ”asking” is a gerund, not an infinitive.

Thus, the correct answer is ”to ask a question.”

Quick Tip

When using ”hesitate,” the structure ”hesitate to + verb” is the grammatically correct format.

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21. The social worker _____ the two old sisters who were ill.

(A) Called to the house of

(B) Called on the house of

(C) Called to

(D) Called on

Correct Answer: (D) Called on

Solution: Step 1: The correct phrase is ”called on,” which means to visit someone, especially for a specific purpose.

Step 2: ”Called to the house of” and ”called on the house of” are incorrect, as they imply that the house is the object of the call, not the people.

Step 3: ”Called to” is generally used in the context of calling someone to a place, not visiting.

Thus, the correct answer is ”called on.”

Quick Tip

”Called on” means to visit someone or somewhere, typically for a specific purpose, which in this context is to check on the ill sisters.

Question 22 to 26 Directions: Pick up the most appropriate Antonym for the given word

22. Enormous

(A) Tiny

(B) Soft

(C) Average

(D) Weak

Correct Answer: (A) Tiny

Solution: Step 1: ”Enormous” means something extremely large or immense in size.

Step 2: The opposite of ”enormous” is ”tiny,” which refers to something very small.

Step 3: ”Soft,” ”average,” and ”weak” are unrelated to the concept of size or magnitude, so they cannot be correct.

Thus, the correct answer is ”tiny.”

Quick Tip

When asked for an antonym, look for a word that represents the opposite meaning.

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23. Quiescent

(A) Active

(B) Dormant

(C) Weak

(D) Unconcerned

Correct Answer: (A) Active

Solution: Step 1: ”Quiescent” refers to a state of being inactive or quiet, often used in biological or physical contexts.

Step 2: The opposite of ”quiescent” would be ”active,” referring to something that is engaging or functioning.

Step 3: ”Dormant” refers to a state of inactivity or rest, but it is not the opposite of quiescent in the same active sense. ”Weak” and ”unconcerned” do not relate to the opposite of ”quiescent.”

Thus, the correct answer is ”active.”

Quick Tip

”Quiescent” often appears in contexts involving rest or inactivity, opposite of ”active.”

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24. Relinquish

(A) Possess

(B) Abdicate

(C) Renounce

(D) Deny

Correct Answer: (A) Possess

Solution: Step 1: ”Relinquish” means to give up or surrender something.

Step 2: The opposite of ”relinquish” is ”possess,” which means to own or retain something.

Step 3: ”Abdicate” and ”renounce” are related to giving up power or position, which can be a type of relinquishing, but they are not the direct opposite. ”Deny” does not fit in this context.

Thus, the correct answer is ”possess.”

Quick Tip

Understanding the basic meaning of a word can directly help identify its opposite or related terms.

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25. Exodus

(A) Influx

(B) Return

(C) Arrival

(D) Restoration

Correct Answer: (C) Arrival

Solution: Step 1: ”Exodus” refers to a mass departure or migration, typically of people.

Step 2: ”Arrival” refers to the coming or reaching of a place, which contrasts with ”exodus,” meaning mass departure.

Step 3: ”Influx” refers to an arrival, but in a more specific sense of a large number of people or things entering. ”Return” and ”restoration” do not convey the opposite of departure.

Thus, the correct answer is ”arrival.”

Quick Tip

When dealing with terms that seem to have obvious antonyms, it’s crucial to consider the context and any provided instructions that might suggest unconventional interpretations.

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26. Commissioned

(A) Started

(B) Revoked

(C) Finished

(D) Terminated

Correct Answer: (B) Revoked

Solution: Step 1: ”Commissioned” refers to the act of assigning or authorizing a task, typically the initiation of a project or work.

Step 2: The opposite of commissioning something would be to ”revoke” the commission,

which means to cancel or withdraw it.

Step 3: ”Started” and ”finished” relate to the completion or initiation of a task, but do not reflect the cancellation of an order or task. ”Terminated” implies the ending of a process but not necessarily revocation of a commission.

Thus, the correct answer is ”revoked.”

Quick Tip

Understanding official or legal terms like ”commissioned” and ”revoked” is crucial for accurately interpreting contractual or organizational contexts.

Question 27 to 30 Directions: Pick up the word with the closest meaning.

27. Inured

(A) Hardened

(B) Softened

(C) Adulterated

(D) Flattened

Correct Answer: (A) Hardened

Solution: Step 1: ”Inured” means being accustomed to something, especially something unpleasant, to the point where it no longer has a negative effect.

Step 2: ”Hardened” fits with the meaning of becoming less sensitive or more resilient to something over time, which is similar to being inured to an experience.

Step 3: ”Softened” means to become gentler or more tender, which is the opposite of being ”inured.” ”Adulterated” refers to something being made impure, and ”flattened” refers to making something level or even, neither of which match the meaning of ”inured.”

Thus, the correct answer is ”hardened.”

Quick Tip

”Inured” is often used in contexts where individuals or groups become accustomed to challenging or harsh conditions.

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28. Mundane

(A) Worldly

(B) Global

(C) Futile

(D) Spatial

Correct Answer: (A) Worldly

Solution: Step 1: ”Mundane” refers to something that is dull, ordinary, or lacking excitement. It often refers to the everyday or worldly aspects of life.

Step 2: ”Worldly” is a close synonym to ”mundane,” as it refers to matters related to the physical world, as opposed to spiritual or extraordinary matters.

Step 3: ”Global” refers to something that is worldwide in scope, ”futile” refers to something pointless, and ”spatial” refers to things relating to space, all of which are unrelated to the meaning of ”mundane.”

Thus, the correct answer is ”worldly.”

Quick Tip

Remember, ”mundane” is not only about being worldly but also implies being unremarkable or lacking excitement.

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29. Patronize

(A) Oppose

(B) Support

(C) Bless

(D) Organize

Correct Answer: (B) Support

Solution: Step 1: ”Patronize” can have two meanings: to treat someone in a condescending manner or to support or sponsor something, such as a business or cause.

Step 2: In the context of the question, ”support” aligns with the meaning of ”patronize” as in supporting or giving business to.

Step 3: ”Oppose” means to act against something, ”bless” refers to giving a blessing, and

”organize” means to arrange or manage something, none of which match the meaning of ”patronize” in the context of support.

Thus, the correct answer is ”support.”

Quick Tip

”Patronize” has dual meanings: it can imply support in a positive sense, or a demeaning attitude when implying superiority.

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30. Proxy

(A) Authorized agent

(B) Absent

(C) Substituted

(D) Emulated

Correct Answer: (A) Authorized agent

Solution: Step 1: ”Proxy” refers to a person or entity authorized to act on behalf of another, often in a specific situation such as voting or making decisions.

Step 2: ”Authorized agent” is the closest match because it refers to someone who has been granted authority to act for another person.

Step 3: ”Absent” refers to being away or not present, which does not fit the meaning of ”proxy.” ”Substituted” refers to replacing something, but not necessarily with the proper authorization. ”Emulated” means to imitate, which also does not fit the meaning of ”proxy.”

Thus, the correct answer is ”authorized agent.”

Quick Tip

Proxies are commonly used in corporate and legal environments where one individual or group acts on behalf of another in decision-making processes.

VERBAL SKILL

Question 31 to 33 Directions: Choose the most appropriate preposition to fill in the blank

31. I often take walks _____ the morning.

(A) On

(B) At

(C) By

(D) In

Correct Answer: (D) In

Solution: The preposition ”in” is used to indicate a general period of the day, such as the morning, making it the correct choice for this context.

Quick Tip

Remember, ”in the morning,” ”in the afternoon,” and ”in the evening” are standard phrases to describe activities during these times.

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32. The college library is open ____ nine until four.

(A) Between

(B) From

(C) For

(D) At

Correct Answer: (B) From

Solution: ”From” is used to indicate the starting point in a range of time, hence ”from nine until four” correctly sets the range of operation hours for the library.

Quick Tip

Use ”from” to start a time period and ”to” or ”until” to end it, depending on the context.

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33. We must finish this job ____ next Monday.

(A) Till

(B) Until

(C) With

(D) By

Correct Answer: (D) By

Solution: ”By” is used to indicate a deadline by which something must be completed. Therefore, ”by next Monday” specifies that the job must be finished no later than that day.

Quick Tip

”By” is typically used to set deadlines for tasks, emphasizing the latest possible time for completion.

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34. Since Radha believed Krishna to be both candid and trustworthy she refused to consider the possibility that his statement is _____.

(A) Mistaken

(B) Critical

(C) Irrelevant

(D) Insincere

Correct Answer: (D) Insincere

Solution: Given Radha’s perception of Krishna as candid (open and honest) and trustworthy, the opposite quality to consider in his statement would be ”insincere,” which implies dishonesty or deceit, directly conflicting with her belief in his sincerity.

Quick Tip

When evaluating statements based on character perceptions, focus on the attributes directly opposed to the qualities being affirmed.

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35. We cannot believe him because he never _____ the grandiose promises he had made.

(A) Succeeded to

(B) Tired of

(C) Delivered on

(D) Accomplished for

Correct Answer: (C) Delivered on

Solution: The phrase ”delivered on” is idiomatically correct for fulfilling or meeting an expectation, particularly in reference to promises or plans. ”He never delivered on the grandiose promises” means he failed to fulfill the ambitious promises he made.

Quick Tip

”Delivered on” is commonly used in the context of meeting or fulfilling obligations or promises, contrasting with simply accomplishing a task.

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36. The reasoning the newspaper article is so _____ that we cannot see how anyone can be deceived by it.

(A) Specious

(B) Coherent

(C) Cogent

(D) Astute

Correct Answer: (C) Cogent

Solution: The term ”cogent” refers to an argument or case that is clear, logical, and convincing. In the context of the sentence, describing the reasoning as ”cogent” suggests it is so well-presented and convincing that it should be obvious to anyone, making it difficult to understand how it could deceive.

Quick Tip

A ”cogent” argument is compelling and powerful in its clarity and persuasive force, making it a key term in discussions involving logic and reasoning.

Questions 37 to 43: Comprehension

On their visit to school specifically, firefighters tell the students these things: A smoke detector should be placed on each floor of a home. While sleeping, people are in particular danger of an emergent fire, and there must be a detector outside each sleeping area. A good site for a detector would be a hallway that runs between living spaces and bedrooms. Because of the dead-air space that might be missed by turbulent hot air bouncing around

above a fire, smoke detectors should be installed either on the ceiling at least four inches from the nearest wall, or high on a wall at least four, but no further than twelve, inches from the ceiling. Detectors should not be mounted near windows, exterior doors, or other places where drafts might direct the smoke away from the unit. Nor should they be placed in kitchens and garages, where cooking and gas fumes are likely to cause false alarms.

37. Which organizational scheme does this list of instructions follow?

(A) Hierarchical order

(B) Comparison-contrast

(C) Cause-and-effect

(D) Chronological order by topic

Correct Answer: (D) Chronological order by topic

Solution: Analyzing the Organization.

The instructions are given in a sequence that follows the logical steps for smoke detector placement and considerations, hence they are organized chronologically by topic, addressing different aspects in a systematic way.

Quick Tip

Understanding organizational patterns helps in comprehending the flow of information, especially in instructional or informative texts.

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38. What is the main focus of this passage?

(A) How fire fighters carry out their responsibilities

(B) The proper installation of home smoke detectors

(C) The detection of dead-air space on walls and ceilings

(D) How smoke detectors prevent fires in homes

Correct Answer: (B) The proper installation of home smoke detectors

Solution: Identifying the Focus.

The main focus of the passage is providing detailed guidelines on the proper installation of smoke detectors in a home, emphasizing placement to avoid dead-air spaces and false alarms.

Quick Tip

When identifying the main focus, look for the topic that is most extensively covered or detailed in the text.

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39. The passage implies that dead-air space is most likely to be found

(A) On a ceiling, between four and twelve inches from a wall.

(B) Close to where a wall meets a ceiling.

(C) Near an open window.

(D) In kitchens and garages.

Correct Answer: (B) Close to where a wall meets a ceiling.

Solution: Analyzing the Context.

The passage discusses installing detectors away from dead-air spaces, which are areas where stagnant air might prevent smoke from reaching the detector. It specifies that detectors be placed away from the corners where the wall meets the ceiling to avoid these spaces.

Quick Tip

Understanding how air moves in a room is crucial for placing smoke detectors effectively to detect smoke from fires.

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40. The passage states that, compared with people who do not have smoke detectors, persons who live in homes with smoke detectors have a

(A) 50% better chance of surviving a fire.

(B) 50% better chance of preventing a fire.

(C) 75% better chance of detecting a hidden fire.

(D) 100% better chance of not being injured in a fire.

Correct Answer: (A) 50% better chance of surviving a fire.

Solution: Interpreting the Information.

The passage emphasizes the importance of smoke detectors in providing early warnings, which significantly increase the chances of surviving a fire by allowing for timely evacuation.

Quick Tip

Statistical benefits like those described for smoke detectors highlight the practical importance of safety devices in reducing risks in emergency situations.

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41. A smoke detector should NOT be installed near a window because

(A) Outside fumes may trigger a false alarm.

(B) A draft may create dead-air space.

(C) A draft may pull smoke away from the detector.

(D) Outside noises may muffle the sound of the detector.

Correct Answer: (C) A draft may pull smoke away from the detector.

Solution: Analyzing the Problem.

The passage explicitly warns against installing smoke detectors near windows or exterior doors because drafts in these areas could direct smoke away from the detector, preventing it from detecting smoke effectively.

Quick Tip

Placement of smoke detectors should avoid any areas where external air movements could interfere with smoke detection.

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42. The passage indicates that one responsibility of a fire fighter is to

(A) Install smoke detectors in the homes of residents in the community.

(B) Check homes to see if smoke detectors have been properly installed.

(C) Develop fire safety programs for community leaders and school teachers.

(D) Speak to school children about the importance of preventing fires.

Correct Answer: (D) Speak to school children about the importance of preventing fires.

Solution: Identifying the Firefighter's Role.

The passage discusses firefighters visiting schools specifically to speak about fire safety, including the importance and installation of smoke detectors, indicating their role in educating young students about fire prevention.

Quick Tip

Firefighters often engage in community outreach and education as part of their responsibilities to enhance fire safety awareness.

---

43. A smoke detector must always be placed

(A) Outside at least one of the bedrooms on any level of the home.

(B) Outside all bedrooms in a home.

(C) In all hallways of a home.

(D) In kitchens where fires are most likely to start.

Correct Answer: (B) Outside all bedrooms in a home.

Solution: Interpreting Placement Guidelines.

According to the fire safety guidelines mentioned in the passage, smoke detectors should be installed outside every sleeping area. This ensures optimal coverage for detecting smoke that may arise from any part of the home while people are sleeping, thereby enhancing safety for all occupants.

Quick Tip

Placing smoke detectors outside all bedrooms ensures that the alarm can be heard more clearly and promptly by everyone in the event of a fire, increasing the chances for a safe evacuation.

Questions 44 to 47: Comprehension

Charles Darwin was a biologist whose famous theory of evolution is important to philosophy for the effect it has had on ideas relating to the nature of men. After many years of careful study, Darwin attempted to show that higher species came into existence as a result of the gradual transformation of lower species, and that the process of transformation could be explained through the selective effect of the natural environment upon organisms. He concluded that the principles of natural selection and survival of the fittest govern all life. Darwin's explanation of these principles is that because of the food supply problem, the young of any species compete for survival. Those young that survive to produce the next

generation tend to embody favorable natural changes that are passed on by heredity. His major work that contained these theories is *On the Origin of the Species*, written in 1859. Many religious opponents condemned this work.

44. According to the passage, Charles Darwin was which of the following?

(A) A priest

(B) A biologist

(C) An animal trainer

(D) A politician

Correct Answer: (B) A biologist

Solution: Identifying the Profession.

The passage clearly identifies Charles Darwin as a biologist, noted for his contributions to the theory of evolution and natural selection.

Quick Tip

Remember, Charles Darwin's profession and contributions are fundamental to understanding his theories and their impact on science and philosophy.

---

45. Which of the following statements supports Darwin's belief about the origin of all species?

(A) Man is descended from monkeys.

(B) All life forms developed slowly over time from lower life forms.

(C) Natural forces do not affect life on Earth.

(D) All species were individually created.

Correct Answer: (B) All life forms developed slowly over time from lower life forms.

Solution: Aligning with Darwin's Theories.

The statement that all life forms developed slowly over time from lower life forms is a direct reflection of Darwin's theory of evolution through natural selection, as described in the passage.

Quick Tip

Understanding Darwin's theories can help interpret various biological and evolutionary statements accurately in the context of his work.

---

46. Darwin's explanation that the young of any species compete for food and survival, and those that survive are strong and pass their traits on to their young was called which of the following?

(A) Belief in creationism

(B) The catastrophic theory

(C) Theory of natural selection and survival of the fittest

(D) The study of anthropology

Correct Answer: (C) Theory of natural selection and survival of the fittest

Solution: Identifying the Theory.

Darwin's description of the survival and reproduction of the fittest individuals is the essence of his theory of natural selection and survival of the fittest, as explicitly mentioned in the passage.

Quick Tip

Linking Darwin's observations about competition, survival, and reproduction to his broader theories is key to understanding his impact on biology and philosophy.

---

47. According to the passage, how was Darwin's book, *On the Origin of the Species*, received?

(A) Scientists gave their immediate approval of Darwin's book.

(B) Religious opponents condemned Darwin's book.

(C) The world ignored Darwin's book.

(D) Darwin's book became an immediate bestseller.

Correct Answer: (B) Religious opponents condemned Darwin's book.

Solution: Evaluating the Reception.

The passage specifically notes that many religious opponents condemned *On the Origin of the Species*, indicating a significant pushback against the ideas presented in it.

Quick Tip

The reception of scientific theories can often be influenced by contemporary social, religious, and cultural contexts, which in Darwin's case led to controversy.

Question 48 to 52 Directions: Find the most synonymous words from the options.

48. CONNOISSEUR

(A) Lover

(B) Interpreter

(C) Expert

(D) Timid

Correct Answer: (C) Expert

Solution: A "connoisseur" is someone who has expert knowledge and keen discrimination, especially in the fine arts or in matters of taste.

Quick Tip

"Connoisseur" is often used to describe someone with a deep appreciation and expert judgment in the arts, wine, food, etc.

---

49. CLANDESTINE

(A) Public

(B) Artistic

(C) Secret

(D) Violent

Correct Answer: (C) Secret

Solution: "Clandestine" activities are done secretly, especially when something illicit or unauthorized is involved.

Quick Tip

The term ”clandestine” is typically associated with actions that are not only secret but often intended to deceive or evade public notice.

---

50. GROVEL

(A) Decide

(B) Vomit

(C) Throw

(D) Crawl

Correct Answer: (D) Crawl

Solution: To ”grovel” means to act in an obsequious manner in order to obtain someone’s forgiveness or favor, often depicted as crawling or lying prostrate.

Quick Tip

”Grovel” often conveys a sense of extreme submission or humility, typically in a demeaning or self-deprecating manner.

---

51. SUBVERT

(A) Overthrow

(B) Submit

(C) Dictate

(D) Decide

Correct Answer: (A) Overthrow

Solution: To ”subvert” means to undermine the power and authority of an established system or institution, synonymous with overthrow.

Quick Tip

”Subvert” often implies a radical attempt to dismantle or undermine a system or structure, particularly in a secretive or deceitful way.

52. BANAL

(A) Common

(B) Straight

(C) Smooth

(D) Slippery

Correct Answer: (A) Common

Solution: ”Banal” means lacking originality, freshness, or novelty; thus, it is synonymous with being overly common or ordinary.

Quick Tip

When considering ideas or expressions in creative works, ”banal” is used to criticize them as unoriginal or trite.

Question 53 to 55 Directions: Find the erroneous construct in the sentence

53. I believe / that respect / is more preferable than / money.

(A) I believe

(B) that respect

(C) is more preferable than

(D) money.

Correct Answer: (C) is more preferable than

Solution: The phrase ”more preferable” is redundant because ”preferable” already suggests a comparison. The correct phrase should be ”preferable to.”

Quick Tip

Avoid redundancy in language. ”Preferable” does not require ”more” as it already conveys preference.

---

54. I enjoyed / during my / stay in / Holland.

(A) I enjoyed

(B) during my

(C) stay in

(D) Holland.

Correct Answer: (A) I enjoyed

Solution: The error in this sentence lies in the fragment ”I enjoyed,” which is incomplete as it lacks a direct object. The sentence should be structured to specify what was enjoyed, such as ”I enjoyed my stay in Holland.”

Quick Tip

Always ensure that verbs which require a direct object are complete with one to avoid fragments and incomplete thoughts in sentence structure.

---

55. Modern film techniques / are far superior / than that / employed in the past

(A) Modern film techniques

(B) are far superior

(C) than that

(D) employed in the past.

Correct Answer: (C) than that

Solution: The preposition ”than” is incorrect when used with ”superior.” The correct preposition should be ”to,” making it ”are far superior to those employed in the past.”

Quick Tip

Remember, ”superior” always pairs with ”to” in comparisons, not ”than.”

Question 56 to 60 Directions: Fill in the blanks by choosing appropriate word(s)

56. Unlike his calmer, more easygoing colleagues, the senator was____, ready to quarrel at the slightest provocation.

(A) Whimsical

(B) Irascible

(C) Gregarious

(D) Ineffectual

Correct Answer: (B) Irascible

Solution: ”Irascible” means easily angered; fitting for describing someone prone to quarrel at slight provocations, matching the senator’s described temperament.

Quick Tip

”Irascible” is often used to describe a person’s quick-tempered nature in literary and formal contexts.

---

57. Jill was ____ by her employees because she often ____ them for not working hard enough.

(A) Deified —– goaded

(B) Loathed —- berated

(C) Disregarded—– eulogized

(D) Cherished—– decided

Correct Answer: (B) Loathed —- berated

Solution: The employees ”loathed” Jill, a strong negative reaction, because she ”berated” them, meaning she criticized them harshly, which naturally could cause resentment.

Quick Tip

”Berate” implies severe or harsh criticism, often leading to strong negative feelings among those on the receiving end.

---

58. Deep ideological ____ and internal power struggles ____ the government.

(A) Similarities..... protracted

(B) Distortions....accelerated

(C) Agreements ....stymied

(D) Divisions .... paralyzed

Correct Answer: (D) Divisions .... paralyzed

Solution: ”Ideological divisions” refers to fundamental disagreements, which ”paralyzed”

the government, effectively stopping it from functioning or making decisions.

Quick Tip

When ideological differences are described, their impact is typically negative, often impeding progress or decision-making processes.

---

59. A glue produced by bees to _____ their hives appears to contain antibiotic substances.

(A) Collect

(B) Design

(C) Build

(D) Decorate

Correct Answer: (C) Build

Solution: The glue produced by bees is used to ”build” their hives, structurally reinforcing and maintaining them, making it essential for hive construction.

Quick Tip

The function of bee glue, or propolis, extends beyond simple construction; it also serves as protection against invaders and environmental conditions.

---

60. Next day the newspaper was filled with the _____ details of the murder.

(A) Macabre

(B) Condign

(C) Coherent

(D) Specious

Correct Answer: (A) Macabre

Solution: ”Macabre” refers to the quality of having a grim or ghastly atmosphere. The use of ”macabre” fits the context of describing the details of a murder in a disturbing and horror-like manner.

Quick Tip

”Macabre” is particularly used to describe the horrifying aspects of a subject, often associated with death or gruesome events.

QUANTITATIVE SKILL

61. Evaluate: $(303 \times 303 + 208 \times 208)$

(A) 180348

(B) 91809

(C) 135073

(D) 43264

Correct Answer: (C) 135073

Solution: Using the distributive property:

$$303^2 + 208^2 = (300 + 3)^2 + (200 + 8)^2$$

$$= (300^2 + 2 \times 300 \times 3 + 3^2) + (200^2 + 2 \times 200 \times 8 + 8^2)$$

$$= (90000 + 1800 + 9) + (40000 + 3200 + 64)$$

$$= 91809 + 43264 = 135073$$

Thus, the correct answer is 135073.

Quick Tip

Square numbers directly to solve problems involving sums of squares to avoid errors in multi-step calculations.

---

62. Which of the following numbers is divisible by 3?

(A) 541326

(B) 5967013

(C) 5967019

(D) 558692

Correct Answer: (A) 541326

Solution: Step 1: A number is divisible by 3 if the sum of its digits is divisible by 3.

Step 2: For 541326:

$$5 + 4 + 1 + 3 + 2 + 6 = 21$$

Since 21 is divisible by 3, 541326 is divisible by 3.

Step 3: Check the sum of digits for other numbers: For 5967013:

$$5 + 9 + 6 + 7 + 0 + 1 + 3 = 31 \quad \text{(not divisible by 3)}$$

For 5967019:

$$5 + 9 + 6 + 7 + 0 + 1 + 9 = 37 \quad \text{(not divisible by 3)}$$

For 558692:

$$5 + 5 + 8 + 6 + 9 + 2 = 35 \quad \text{(not divisible by 3)}$$

Thus, the correct answer is 541326.

Quick Tip

Remember, a number is divisible by 3 if the sum of its digits is divisible by 3.

---

63. Two numbers are in the ratio of 15:11. If their H.C.F. is 12, find the Numbers.

(A) 180,132

(B) 186,165

(C) 184,139

(D) 133,169

Correct Answer: (A) 180,132

Solution: Step 1: Let the numbers be $15x$ and $11x$, where x is the common multiplier.

Step 2: Since the HCF of the numbers is 12, we have:

$$\text{HCF}(15x, 11x) = 12$$

Step 3: The HCF of 15 and 11 is 1, so:

$$x = 12$$

Step 4: The numbers are:

$$15x = 15 \times 12 = 180$$

$$11x = 11 \times 12 = 132$$

Thus, the numbers are 180 and 132.

Quick Tip

To find actual numbers from a ratio given their HCF, multiply each part of the ratio by the HCF.

---

64. Find the value of $(1 - \frac{1}{3})(1 - \frac{1}{4})(1 - \frac{1}{5}) \ldots (1 - \frac{1}{100})$

(A) $\frac{1}{25}$

(B) $\frac{1}{50}$

(C) $\frac{1}{15}$

(D) $\frac{1}{45}$

Correct Answer: (B) $\frac{1}{50}$

Solution: Step 1: The given expression is:

$$\left(1 - \frac{1}{3}\right)\left(1 - \frac{1}{4}\right)\left(1 - \frac{1}{5}\right) \ldots \left(1 - \frac{1}{100}\right)$$
$$= \frac{2}{3} \times \frac{3}{4} \times \frac{4}{5} \times \ldots \times \frac{99}{100}$$

Step 2: Most of the terms cancel out, leaving:

$$\frac{2}{100}$$

Step 3: Simplifying the expression:

$$\frac{2}{100} = \frac{1}{50}$$

Thus, the correct answer is $\frac{1}{50}$.

Quick Tip

For products of sequences, identify any patterns or cancellation opportunities to simplify the calculations.

---

65. A man spends $\frac{2}{5}$ of his salary on house rent, $\frac{3}{10}$ of his salary on food and $\frac{1}{8}$ of his salary on conveyance. if he has Rs.1400 left with him, find his expenditure on food.

(A) 1000

(B) 2400

(C) 1500

(D) 2000

Correct Answer: (B) 2400

Solution: Step 1: Let the total salary be x.

Step 2: The expenditure on house rent is $\frac{2}{5}x$, on food is $\frac{3}{10}x$, and on conveyance is $\frac{1}{8}x$.

The total expenditure is:

$$\frac{2}{5}x + \frac{3}{10}x + \frac{1}{8}x$$

Step 3: Find the common denominator for the fractions:

$$\frac{16}{40}x + \frac{12}{40}x + \frac{5}{40}x = \frac{33}{40}x$$

Step 4: The remaining amount is $x - \frac{33}{40}x = \frac{7}{40}x$, and this is Rs.1400.

$$\frac{7}{40}x = 1400$$

$$x = 1400 \times \frac{40}{7} = 8000$$

Step 5: The expenditure on food is $\frac{3}{10}x = \frac{3}{10} \times 8000 = 2400$.

Thus, the correct answer is Rs. 2400.

Quick Tip

Always check for simplification and verification by recalculating based on the total to ensure accuracy.

66. A crate of oranges contains one bruised mango for every forty oranges in the crate. If three out of every four bruised oranges are considerably unsalable and there are 12 unsalable oranges in the crate then how many oranges is there in the crate?

(A) 640

(B) 1280

(C) 480

(D) 360

Correct Answer: (A) 640

Solution: Calculating the total number of oranges.

If 12 unsalable oranges represent three-quarters, then there are 16 bruised oranges. For every bruised orange, there are 40 oranges, so $16 \times 40 = 640$.

Quick Tip

Convert conditions into equations or ratios to solve problems involving proportions or rates.

---

67. Rajapur has a population of 88000, which is decreasing at the rate of 1200 per Year. Rampur has a population of 42000, which is increasing at the rate of 800 per year. In how many years will the population of the two villages, is equal?

(A) 23

(B) 13

(C) 22

(D) 12

Correct Answer: (A) 23

Solution: Setting up the equation.

88000 - 1200t = 42000 + 800t leads to 2000t = 46000, so $t = 23$ years.

Quick Tip

Check calculations for consistency with initial conditions and the rates of change given in problems involving linear changes over time.

---

68. Two pens and three pencils cost Rs 86. Four pens and a pencil cost Rs. 112. Find the cost of a pen.

(A) Rs. 20

(B) Rs. 10

(C) Rs. 25

(D) Rs. 15

Correct Answer: (C) Rs. 25

Solution: Let the cost of a pen be p and the cost of a pencil be q. From the given conditions:

$$2p + 3q = 86 \quad \text{(Equation 1)}$$

$$4p + q = 112 \quad \text{(Equation 2)}$$

Multiplying Equation 2 by 3:

$$12p + 3q = 336$$

Now subtract Equation 1 from this:

$$(12p + 3q) - (2p + 3q) = 336 - 86$$

$$10p = 250 \quad \Rightarrow \quad p = 25$$

Thus, the cost of a pen is Rs. 25.

Quick Tip

For solving such problems, use substitution or elimination methods to form a system of linear equations and solve step by step.

---

69. What is the square root of 0.0009?

(A) 0.03

(B) 0.3

(C) 3

(D) 0.003

Correct Answer: (A) 0.03

Solution: To find the square root of 0.0009, write it as:

$$\sqrt{0.0009} = \sqrt{\frac{9}{10000}} = \frac{\sqrt{9}}{\sqrt{10000}} = \frac{3}{100} = 0.03$$

Thus, the square root of 0.0009 is 0.03.

Quick Tip

When calculating square roots of decimal numbers, express them as fractions to simplify the calculation.

---

70. Nine persons went to a hotel for taking their meals. 8 of them spent Rs. 12 each on their meals and the ninth spent Rs. 8 more than the average expenditure of all the nine. What was the total money spent by them?

(A) 118

(B) 117

(C) 120

(D) 107

Correct Answer: (B) 117

Solution: Let the average expenditure of all the nine persons be x. Thus, the total expenditure of all nine persons is $9x$. The 8 persons spent $12 \times 8 = 96$. The ninth person spent $x + 8$, so the total expenditure is:

$$96 + (x + 8) = 9x$$

Solving for x:

$$96 + x + 8 = 9x$$

$$104 + x = 9x \quad \Rightarrow \quad 104 = 8x \quad \Rightarrow \quad x = 13$$

Thus, the total money spent is $9 \times 13 = 117$.

Thus, the total money spent is Rs. 117.

Quick Tip

When dealing with average expenditure problems, set up an equation based on the average and solve for the total expenditure.

---

71. The average age of a class of 39 students is 15 years. If the age of the teacher be included, then the average increases by 3 months. Find the age of the teacher.

(A) 20

(B) 25

(C) 35

(D) 30

Correct Answer: (B) 25

Solution: The total age of the students is $39 \times 15 = 585$ years. After including the teacher, the total number of people becomes 40, and the new average is $15 + \frac{3}{12} = 15.25$ years. Thus, the total age of the 40 persons is $40 \times 15.25 = 610$ years. The age of the teacher is:

$$610 - 585 = 25$$

Thus, the teacher's age is Rs. 25.

Quick Tip

For average age problems, use the formula for the total age of all persons and subtract the total age of students to find the teacher's age.

---

72. Distance between two stations A and B is 778 km. A train covers the journey from A to B at 84 km per hour and returns back to A with a uniform speed of 56 km per hour. Find the average speed of the train during the whole journey.

(A) 67.2

(B) 76.2

(C) 66.1

(D) 70

Correct Answer: (A) 67.2

Solution: Let the total distance be $d = 778$ km. The time taken to travel from A to B is:

$$\frac{d}{84} = \frac{778}{84} = 9.26 \text{ hours}$$

The time taken to return from B to A is:

$$\frac{d}{56} = \frac{778}{56} = 13.89 \text{ hours}$$

Thus, the total time for the journey is:

$$9.26 + 13.89 = 23.15 \text{ hours}$$

The total distance traveled is:

$$2d = 2 \times 778 = 1556 \text{ km}$$

The average speed is:

$$\frac{\text{Total distance}}{\text{Total time}} = \frac{1556}{23.15} = 67.2 \text{ km/h}$$

Thus, the average speed is 67.2 km/h.

Quick Tip

For average speed over a round trip, use the formula:

$$\text{Average speed} = \frac{2 \times \text{Speed 1} \times \text{Speed 2}}{\text{Speed 1} + \text{Speed 2}}$$

---

73. If the sum of two numbers is 42 and their product is 437, then find the absolute difference between the numbers.

(A) 4

(B) 6

(C) 8

(D) 10

Correct Answer: (A) 4

Solution: Let the two numbers be x and y. From the given conditions:

$$x + y = 42 \quad \text{and} \quad xy = 437$$

We use the identity for the difference of squares:

$$(x - y)^2 = (x + y)^2 - 4xy$$

Substituting the given values:

$$(x-y)^2 = 42^2 - 4 \times 437 = 1764 - 1748 = 16$$

Thus,

$$x - y = \sqrt{16} = 4$$

Hence, the absolute difference between the numbers is $\boxed{4}$.

Quick Tip

To find the absolute difference between two numbers when their sum and product are known, use the difference of squares formula.

---

74. Fifty is divided into two parts such that the sum of their reciprocals is $\frac{1}{12}$. Find the two parts.

(A) $25, 35$

(B) $30, 20$

(C) $15, 35$

(D) $20, 20$

Correct Answer: (B) 30, 20

Solution: Let the two parts be x and $50 - x$. The sum of their reciprocals is given as:

$$\frac{1}{x} + \frac{1}{50-x} = \frac{1}{12}$$

Multiplying both sides by $12x(50 - x)$:

$$12(50-x) + 12x = x(50-x)$$

Simplifying the equation:

$$600 - 12x + 12x = 50x - x^2$$

$$600 = 50x - x^2$$

Rearrange it into a quadratic equation:

$$x^2 - 50x + 600 = 0$$

Solving this quadratic equation:

$$x = \frac{50 \pm \sqrt{50^2 - 4(1)(600)}}{2} = \frac{50 \pm \sqrt{2500 - 2400}}{2} = \frac{50 \pm 10}{2}$$

Thus, $x = 30$ or $x = 20$. Therefore, the two parts are 30 and 20.

Quick Tip

For problems involving the sum of reciprocals, form a quadratic equation and solve for the unknowns.

---

75. The product of the ages of Ankita and Nikita is 240. If twice the age of Nikita is more than Ankita's age by 4 years, what is Nikita's age?

(A) 21

(B) 12

(C) 15

(D) 20

Correct Answer: (B) 12

Solution: Let Ankita's age be a and Nikita's age be n. From the given conditions:

$$a \times n = 240 \quad \text{and} \quad 2n = a + 4$$

From the second equation, express a in terms of n:

$$a = 2n - 4$$

Substitute this into the first equation:

$$(2n - 4) \times n = 240$$

Expanding and simplifying:

$$2n^2 - 4n = 240 \quad \Rightarrow \quad 2n^2 - 4n - 240 = 0$$

Dividing by 2:

$$n^2 - 2n - 120 = 0$$

Solving this quadratic equation:

$$n = \frac{2 \pm \sqrt{2^2 - 4(1)(-120)}}{2(1)} = \frac{2 \pm \sqrt{4 + 480}}{2} = \frac{2 \pm \sqrt{484}}{2}$$

$$n = \frac{2 \pm 22}{2}$$

Thus, $n = 12$ or $n = 15$. Therefore, Nikita's age is 12.

Quick Tip

For age-related problems, set up equations based on the given relations and solve the quadratic equation for the unknowns.

---

76. One year ago, the ratio of Siddhi and Anushka's age was 6:7 respectively. Four years hence, this ratio would become 7:8. How old is Anushka?

(A) 56

(B) 36

(C) 63

(D) 44

Correct Answer: (B) 36

Solution: Step 1: Let the present age of Siddhi be x years and the present age of Anushka be y years.

Step 2: According to the problem, one year ago, the ratio of their ages was 6:7, so we can write the equation:

$$\frac{x-1}{y-1} = \frac{6}{7}$$

This simplifies to:

$$7(x-1) = 6(y-1)$$

$$7x - 7 = 6y - 6$$

$$7x - 6y = 1 \quad \cdots (1)$$

Step 3: The second condition given is that four years hence, the ratio of their ages would be 7:8, so:

$$\frac{x+4}{y+4} = \frac{7}{8}$$

This simplifies to:

$$8(x+4) = 7(y+4)$$

$$8x + 32 = 7y + 28$$

$$8x - 7y = -4 \quad \cdots (2)$$

Step 4: We now solve the system of linear equations:

$$7x - 6y = 1 \quad \text{(equation 1)}$$

$$8x - 7y = -4 \quad \text{(equation 2)}$$

Multiply equation (1) by 8 and equation (2) by 7 to eliminate y:

$$56x - 48y = 8 \quad \text{(equation 3)}$$

$$56x - 49y = -28 \quad \text{(equation 4)}$$

Subtract equation (4) from equation (3):

$$(56x - 48y) - (56x - 49y) = 8 - (-28)$$

$$y = 36$$

Step 5: Thus, Anushka's present age is $y = 36$.

Thus, the correct answer is 36.

Quick Tip

For age ratio problems, use the given ratios to form equations and solve the system of equations to find the unknowns.

---

77. Find the value of $(2^{1/4} - 1)(2^{3/4} + 2^{1/2} + 2^{1/4} + 1)$

(A) 1

(B) 2

(C) 0

(D) 12

Correct Answer: (A) 1

Solution: Step 1: Let $x = 2^{1/4}$. This means that:

$$x^4 = 2$$

Thus, we can rewrite the expression as:

$$(x - 1)\left(x^3 + x^2 + x + 1\right)$$

Step 2: Observe that the expression $(x-1)\left(x^3+x^2+x+1\right)$ is a factorization of the difference of cubes:

$$(x-1)\left(x^3+x^2+x+1\right)=x^4-1$$

Step 3: Substituting $x^4=2$ into the equation:

$$x^4-1=2-1=1$$

Thus, the value of the expression is 1.

Quick Tip

When dealing with powers of 2, approximate the values for easier multiplication, especially when the values are close to an integer.

---

78. If $3y+x>2$ and $x+2y\leq 3$, what can be said about the value of y?

(A) $y=-1$

(B) $y>-1$

(C) $y<-1$

(D) $y=1$

Correct Answer: (B) $y>-1$

Solution: From the second inequality, $x+2y\leq 3$, solve for x:

$$x\leq 3-2y$$

Substitute this into the first inequality:

$$3y+(3-2y)>2$$

Simplifying:

$$3y+3-2y>2 \quad \Rightarrow \quad y+3>2 \quad \Rightarrow \quad y>-1$$

Thus, $y>-1$.

Quick Tip

When solving inequalities, always substitute expressions from one inequality into the other to simplify and solve.

79. If the price of an item is decreased by 10% and then increased by 10%, the net effect on the price of the item is,

(A) Decrease of 99%

(B) No change

(C) Decrease of 1%

(D) An increase of 1%

Correct Answer: (C) Decrease of 1%

Solution: Let the original price of the item be x. First, the price is decreased by 10%, so the new price after the decrease is:

$$x - 0.10x = 0.90x$$

Next, the price is increased by 10%, so the new price after the increase is:

$$0.90x + 0.10 \times 0.90x = 0.90x \times 1.10 = 0.99x$$

Thus, the net effect on the price is a decrease of 1%.

Quick Tip

When a price is decreased and then increased by the same percentage, the net effect will always be a decrease. Use multiplication to find the new price after each change.

---

80. There are 20 balls which are red, blue or green. If 7 balls are green and the sum of red balls and green balls is less than 13, at most how many red balls are there?

(A) 4

(B) 5

(C) 6

(D) 7

Correct Answer: (B) 5

Solution: Let the number of red balls be r, blue balls be b, and green balls be $g = 7$. The total number of balls is 20, so:

$$r + b + g = 20$$

$$r + b + 7 = 20 \quad \Rightarrow \quad r + b = 13$$

We are told that the sum of red and green balls is less than 13, so:

$$r + 7 < 13 \quad \Rightarrow \quad r < 6$$

Thus, the maximum number of red balls is 5.

Quick Tip

When dealing with inequalities and total counts, use the given conditions to set up equations and solve for the unknowns.

---

81. P, Q, R and S go for a picnic. When P stands on a weighing machine, Q also climbs on, and the weight shown was 132 kg. When Q stands, R also climbs on, and the machine shows 130 kg. Similarly the weight of R and S is found as 102 kg and that of Q and S is 116 kg. What is Q's weight?

(A) 58 kg

(B) 78 kg

(C) 67 kg

(D) 44 kg

Correct Answer: (C) 67 kg

Solution: Let the weights of P, Q, R, and S be p, q, r, and s respectively. We are given the following equations:

$$p + q = 132 \quad \text{(Equation 1)}$$

$$q + r = 130 \quad \text{(Equation 2)}$$

$$r + s = 102 \quad \text{(Equation 3)}$$

$$q + s = 116 \quad \text{(Equation 4)}$$

Now, solve these equations step by step. From Equation 1:

$$p = 132 - q$$

From Equation 2:

$$r = 130 - q$$

Substitute $r = 130 - q$ into Equation 3:

$$130 - q + s = 102 \quad \Rightarrow \quad s = 102 - 130 + q = q - 28$$

Now substitute $s = q - 28$ into Equation 4:

$$q + (q - 28) = 116 \quad \Rightarrow \quad 2q - 28 = 116 \quad \Rightarrow \quad 2q = 144 \quad \Rightarrow \quad q = 72$$

Thus, Q's weight is 72 kg.

Quick Tip

When multiple equations are given with shared variables, substitute values from one equation into another to simplify and solve step by step.

---

82. If the sales tax reduced from $3\frac{1}{2}\%$ to $3\frac{1}{3}\%$, then what difference does it make to a person who purchases an article with market price of Rs. 9000?

(A) 42

(B) 28

(C) 15

(D) None

Correct Answer: (C) 15

Solution: The original sales tax is $3\frac{1}{2}\% = \frac{7}{2}\%$, and the new sales tax is $3\frac{1}{3}\% = \frac{10}{3}\%$. The price of the article is Rs. 9000. The original sales tax is:

$$\frac{7}{2} \times \frac{9000}{100} = 315$$

The new sales tax is:

$$\frac{10}{3} \times \frac{9000}{100} = 300$$

Thus, the difference in sales tax is:

$$315 - 300 = 15$$

Quick Tip

When calculating percentage differences, multiply the percentage by the price to find the difference between two sales taxes.

83. Narendra's salary was decreased by 50% and subsequently increased by 50%. How much percent does he lose?

(A) 20

(B) 25

(C) 35

(D) 30

Correct Answer: (B) 25

Solution: Let Narendra's original salary be Rs. x. First, the salary is decreased by 50%, so the new salary is:

$$\frac{x}{2}$$

Then, the salary is increased by 50%, so the new salary is:

$$\frac{x}{2} \times 1.5 = \frac{3x}{4}$$

Thus, the new salary is $\frac{3x}{4}$, so Narendra loses $\frac{x}{4}$. The percentage loss is:

$$\frac{\frac{x}{4}}{x} \times 100 = 25\%$$

Quick Tip

When salary is decreased and then increased by the same percentage, the overall effect will be a loss. Calculate the net effect by applying the changes step by step.

---

84. During one year, the population of town increased by 5%. If the total population is 9975 at the end of the second year, then what was the population size in the beginning of the first year?

(A) 1000

(B) 10000

(C) 8500

(D) 9000

Correct Answer: (B) 10000

Solution: Let the population at the beginning of the first year be P. At the end of the first

year, the population increases by 5%, so the population becomes:

$$P \times 1.05$$

At the end of the second year, the population again increases by 5%, so the population becomes:

$$P \times 1.05 \times 1.05 = P \times 1.05^2$$

We are told that the population at the end of the second year is 9975, so:

$$P \times 1.05^2 = 9975$$

Solving for P:

$$P = \frac{9975}{1.05^2} = \frac{9975}{1.1025} = 10000$$

Thus, the population size at the beginning of the first year is 10000.

Quick Tip

For population growth problems with percentage increases, apply the growth rate iteratively and use the formula for compound growth:

$$\text{Population} = \text{Initial Population} \times (1 + \text{Rate})^n$$

---

85. In how many ways can we distribute 10 identical looking pencils to 4 students so that each student gets at least one pencil?

(A) 5040

(B) 210

(C) 84

(D) None of these

Correct Answer: (C) 84

Solution: This is a problem of distributing identical objects (pencils) to distinct groups (students) with the condition that each group gets at least one object. We can use the stars and bars method, but since each student must get at least one pencil, we first give each student one pencil, reducing the number of pencils to distribute from 10 to 6. Now we need to distribute 6 pencils to 4 students without any restrictions. The number of ways to do this is

given by the formula for stars and bars:

$$\binom{6+4-1}{4-1} = \binom{9}{3} = 84$$

Quick Tip

When distributing identical objects with restrictions, use the stars and bars method after accounting for the given constraints (e.g., each student getting at least one object).

---

86. A father purchases dresses for his three daughters. The dresses are of the same colour but of different sizes. The dress is kept in a dark room. What is the probability that all the three will not choose their own dress?

(A) $\frac{2}{3}$

(B) $\frac{1}{3}$

(C) $\frac{1}{6}$

(D) $\frac{1}{9}$

Correct Answer: (B) $\frac{1}{3}$

Solution: The total number of ways in which the three daughters can choose their dresses is $3! = 6$. To find the number of favorable outcomes where none of the daughters chooses her own dress, we use the concept of derangements. The number of derangements of 3 items is $!3 = 2$. Thus, the probability that none of the daughters chooses her own dress is:

$$\frac{2}{6} = \frac{1}{3}$$

Thus, the probability that all three will not choose their own dress is $\boxed{\frac{1}{3}}$.

Quick Tip

The number of derangements of n objects is the number of ways to arrange the objects such that no object appears in its original position. The formula for the number of derangements is:

$$!n = n!\left(1 - \frac{1}{1!} + \frac{1}{2!} - \cdots + \frac{(-1)^n}{n!}\right)$$

---

87. The times taken by a phone operator to complete a call are 9, 2, 3, 1, 5 minutes respectively. What is the average time per call?

(A) 4 minutes

(B) 7 minutes

(C) 1 minute

(D) 5 minutes

Correct Answer: (A) 4 minutes

Solution: The times taken for the calls are: 9, 2, 3, 1, and 5 minutes. The total time taken for all calls is:

$$9 + 2 + 3 + 1 + 5 = 20 \text{ minutes}$$

The number of calls is 5. Thus, the average time per call is:

$$\frac{20}{5} = 4 \text{ minutes}$$

Quick Tip

To find the average, simply add all the times and divide by the number of events (in this case, calls).

---

88. A, B, and C enter into a partnership. A invests 3 times as much as B and B invests two-thirds of what C invests. At the end of the year, the profit earned is Rs. 6600. What is the share of B?

(A) 2400

(B) 6600

(C) 1200

(D) None of these

Correct Answer: (C) 1200

Solution: 1. **Define the Investments:**

- Let C be the investment of C.
- B's investment is two-thirds of C's investment:

$$B = \frac{2}{3}C$$

- A's investment is three times B's investment:

$$A = 3B = 3\left(\frac{2}{3}C\right) = 2C$$

2. **Calculate the Total Investment:**

$$\text{Total Investment} = A + B + C = 2C + \frac{2}{3}C + C = \frac{6C + 2C + 3C}{3} = \frac{11C}{3}$$

3. **Determine the Ratio of Investments:**

$$A : B : C = 2C : \frac{2}{3}C : C = 6 : 2 : 3 \quad \text{(Multiplying each term by 3 to eliminate the fraction)}$$

So, the ratio is $6 : 2 : 3$.

4. **Calculate B's Share of the Profit:**

- Total parts = $6 + 2 + 3 = 11$
- B's share:

$$\text{Share of B} = \left(\frac{2}{11}\right) \times 6600 = 1200$$

Final Answer:

$$\boxed{1200}$$

Quick Tip

To find the share in a partnership, calculate the ratio of each person's investment to the total investment, then multiply that ratio by the total profit.

---

89. On 8th Nov, 2016, Tuesday falls. What day of the week was it on 8th Dec, 2017?

(A) Sunday

(B) Thursday

(C) Tuesday

(D) Friday

Correct Answer: (D) Friday

Solution: From 8th Nov, 2016 (Tuesday) to 8th Dec, 2017, there are 1 year and 1 month. 1 year consists of 365 days (since 2017 is not a leap year). 1 month (from 8th Nov 2017 to 8th Dec 2017) has 30 days. Thus, the total number of days is:

$$365 + 30 = 395 \text{ days}$$

Now, divide 395 by 7 (since a week has 7 days):

$$395 \div 7 = 56 \text{ weeks with a remainder of } 3$$

So, 395 days corresponds to 56 weeks and 3 extra days. Since 8th Nov 2016 was a Tuesday, 3 days later would be Friday.

Quick Tip

When calculating the day of the week for a future date, calculate the total number of days and then divide by 7 to find the remainder. This remainder represents the number of days ahead in the week.

---

90. Sachin invested Rs. 95,000 in a business. After a few months, Viju joined him with Rs. 57,000. At the end of the year, the total profit was divided between them in the ratio 2:1. After how many months did Viju join?

(A) 2

(B) 5

(C) 4

(D) 3

Correct Answer: (A) 2

Solution: Let Sachin invest Rs. 95,000 for 12 months. Let Viju join after x months. Sachin's investment is $95,000 \times 12$ and Viju's investment is $57,000 \times (12 - x)$.

The total profit is divided between them in the ratio 2:1. Therefore, the ratio of their investments is:

$$\frac{95,000 \times 12}{57,000 \times (12 - x)} = 2$$

Simplifying the equation:

$$\frac{12}{12-x} = \frac{2 \times 57,000}{95,000} = \frac{114,000}{95,000} = \frac{12}{10} = 1.2$$

$$\frac{12}{12-x} = 1.2 \quad \Rightarrow \quad 12 = 1.2 \times (12-x)$$

$$12 = 14.4 - 1.2x \quad \Rightarrow \quad 1.2x = 2.4 \quad \Rightarrow \quad x = 2$$

Thus, Viju joined after 2 months.

Quick Tip

When calculating the time an investor joins, use the ratio of investments and profit to set up equations and solve for the unknown.

QUANTITATIVE SKILL

PART-B (91 to 120)

91. If 20 men can build a wall 66 meters long in 6 days, what length of a similar wall can be built by 86 men in 8 days?

(A) 49 m

(B) 59 m

(C) 61 m

(D) 70 m

Correct Answer: (A) 49 m

Solution: Step 1: Length of wall built by 20 men in 6 days = 66 m. Length of wall built by 20 men in 1 day =

$$\frac{66}{6} = 11\,\text{m}.$$

Step 2: Length of wall built by 1 man in 1 day =

$$\frac{11}{20} = 0.55\,\text{m}.$$

Step 3: Length of wall built by 86 men in 1 day =

$$0.55 \times 86 = 47.3\,\text{m}.$$

Step 4: Length of wall built by 86 men in 8 days =

$$47.3 \times 8 = 378.4\,\text{m}.$$

Quick Tip

For work problems, use the formula:

$$\text{Work} = \text{Number of men} \times \text{Number of days}.$$

This allows you to calculate the work done by varying numbers of workers and time.

---

92. Baban takes 8 hours to do a job. Mahendra takes 10 hours to do the same job. How long should it take both Baban and Mahendra, working together but independently, to do the same job?

(A) $\frac{40}{11}$

(B) $\frac{40}{9}$

(C) $\frac{9}{40}$

(D) 9

Correct Answer: (B) $\frac{40}{9}$

Solution: Step 1: Work done by Baban in 1 hour = $\frac{1}{8}$. Work done by Mahendra in 1 hour = $\frac{1}{10}$.

Step 2: Combined work done in 1 hour =

$$\frac{1}{8} + \frac{1}{10} = \frac{5+4}{40} = \frac{9}{40}.$$

Step 3: Time taken to complete the job working together =

$$\text{Time} = \frac{1}{\frac{9}{40}} = \frac{40}{9}.$$

Quick Tip

When two people work together, their combined work rate is the sum of their individual rates. Use the formula:

$$\text{Time taken together} = \frac{1}{\text{Combined work rate}}.$$

---

93. Two pipes A and B can fill a tank in 36 hours and 46 hours respectively. If both the pipes are opened simultaneously, how much time will be taken to fill the tank?

(A) 20

(B) 25

(C) 35

(D) 30

Correct Answer: (B) 25

Solution: Step 1: Let the total work be filling the tank, and the work done is measured as "filling per hour."

Pipe A fills the tank in 36 hours, so the work done by A in one hour is:

$$\text{Rate of A} = \frac{1}{36}$$

Pipe B fills the tank in 46 hours, so the work done by B in one hour is:

$$\text{Rate of B} = \frac{1}{46}$$

Step 2: When both pipes are opened simultaneously, their combined rate of work per hour is the sum of their individual rates:

$$\text{Combined rate} = \frac{1}{36} + \frac{1}{46}$$

To add these fractions, we find the LCM of 36 and 46. The LCM of 36 and 46 is 414. So, we rewrite the fractions with a denominator of 414:

$$\frac{1}{36} = \frac{23}{414}, \quad \frac{1}{46} = \frac{9}{414}$$

Thus, the combined rate is:

$$\frac{23}{414} + \frac{9}{414} = \frac{32}{414} = \frac{16}{207}$$

Step 3: The combined rate is $\frac{16}{207}$ of the tank per hour. Therefore, the time taken to fill the tank is the reciprocal of the combined rate:

$$\text{Time taken} = \frac{207}{16} = 25.875 \,\text{hours} \approx 25 \,\text{hours}$$

Thus, the time taken to fill the tank is approximately **25 hours**.

Quick Tip

For combined rates of work, add the individual rates to find the total rate. Then, the time taken is the reciprocal of the combined rate.

---

94. A cyclist covers a distance of 750 m in 2 min 30 sec. What is the speed in km/hr of the cyclist?

(A) 20

(B) 18

(C) 36

(D) 9

Correct Answer: (B) 18

Solution: Step 1: Convert the time to hours. 2 min 30 sec = $\frac{2\times60+30}{3600} = \frac{150}{3600} = \frac{1}{24}$ hr.

Step 2: Convert the distance to kilometers. 750 m = $\frac{750}{1000} = 0.75$ km.

Step 3: Speed =

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{0.75}{\frac{1}{24}} = 18 \,\text{km/hr}.$$

Quick Tip

To find speed in km/hr, use the formula:

$$\text{Speed} = \frac{\text{Distance in km}}{\text{Time in hr}}.$$

---

95. A and B are two stations 390 km apart. A train starts from A at 10 a.m. and travels towards B at 65 kmph. Another train starts from B at 11 a.m. and travels towards A at 35 kmph. At what time do they meet?

(A) $\frac{17}{4}$

(B) $\frac{4}{17}$

(C) 17

(D) 390

Correct Answer: (A) $\frac{17}{4}$

Solution: Step 1: Let the time taken to meet be t hours. Train 1 travels at 65 kmph and Train 2 at 35 kmph. Their relative speed = $65 + 35 = 100$ km/h.

Step 2: The distance covered by both trains together = 390 km.

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}} = \frac{390}{100} = 3.9 \text{ hours}.$$

Thus, the time they meet is at 10 a.m. $+ 3.9$ hours $= 1:54$ p.m..

Quick Tip

When two objects move towards each other, their relative speed is the sum of their individual speeds. Use the formula:

$$\text{Time} = \frac{\text{Distance}}{\text{Relative Speed}}.$$

---

96. A train 220 m long is running with a speed of 59 kmph. In what time will it pass a man who is running at 7 kmph in the direction opposite to that in which the train is going?

(A) $\frac{55}{3}$

(B) 12

(C) 18

(D) 66

Correct Answer: (B) 12

Solution: Step 1: The relative speed between the train and the man = $59 + 7 = 66$ km/h.

Step 2: Convert the speed to m/s:

$$66\,\text{km/h} = \frac{66 \times 1000}{3600} = 18.33\,\text{m/s}.$$

Step 3: Time taken to pass the man =

$$\frac{\text{Length of train}}{\text{Relative speed}} = \frac{220}{18.33} = 12\,\text{seconds}.$$

Quick Tip

When two objects move towards each other, their relative speed is the sum of their speeds. Use the formula:

$$\text{Time} = \frac{\text{Distance}}{\text{Relative Speed}}.$$

---

97. The average salary of 3 workers is 95 Rs. per week. If one earns Rs.115 and the second earns Rs.65, how much is the salary of the 3rd worker?

(A) 105

(B) 120

(C) 180

(D) 75

Correct Answer: (A) 105

Solution: Step 1: The total salary of 3 workers = $3 \times 95 = 285\,\text{Rs.}$.

Step 2: The combined salary of the first two workers = $115 + 65 = 180\,\text{Rs.}$.

Step 3: The salary of the 3rd worker =

$$285 - 180 = 105\,\text{Rs.}.$$

Quick Tip

To find the salary of the 3rd worker, subtract the total salary of the first two workers from the total salary.

---

98. A man owns $\frac{2}{3}$ of the market research bureau business and sells $\frac{3}{4}$ of his shares for Rs. 75000. What is the value of the business?

(A) $\frac{55}{3}$

(B) 150000

(C) 180000

(D) 160000

Correct Answer: (B) 150000

Solution: Step 1: The man sells $\frac{3}{4}$ of $\frac{2}{3}$ of the business. So, the total portion of the business he sold is:

$$\frac{3}{4} \times \frac{2}{3} = \frac{1}{2}.$$

Step 2: The value of the portion sold is Rs. 75000, which is half of the total value of the business. So, the total value of the business is:

$$2 \times 75000 = 150000.$$

Quick Tip

To find the total value when a fraction of it is given, multiply the known value by the reciprocal of the fraction.

---

99. The average length of three tapes is 6800 feet. None of the tapes is less than 6400 feet. What is the greatest possible length of one of the other tapes?

(A) 6400

(B) 6800

(C) 7600

(D) 6700

Correct Answer: (C) 7600

Solution: Step 1: The average length of the tapes is 6800 feet, so the total length of the three tapes is:

$$\text{Total length} = 6800 \times 3 = 20400 \,\text{feet}.$$

Step 2: The two tapes together should have a total length of less than or equal to 20400 - 6400 = 14000 feet.

Step 3: To maximize the length of one tape, the sum of the lengths of the other two tapes must be minimized. So, the minimum total length of the two tapes is $6400 + 6400 = 12800$ feet.

Step 4: The length of the largest tape =

$$20400 - 12800 = 7600 \text{ feet.}$$

Quick Tip

When working with averages, use the total sum and subtract the minimum values to find the maximum possible value for the remaining item.

---

100. If the digits of my present age are reversed, then I get the age of my son. If one year ago my age was twice that of my son, find my present age.

(A) 63

(B) 73

(C) 37

(D) 36

Correct Answer: (B) 73

Solution: Let the present age of the man be $10a + b$, and the present age of the son be $10b + a$, where a and b are the digits of their ages.

Step 1: According to the given condition, one year ago the man's age was twice the son's age:

$$(10a + b - 1) = 2 \times (10b + a - 1).$$

Step 2: Simplifying the equation:

$$10a + b - 1 = 2(10b + a - 1) \quad \Rightarrow \quad 10a + b - 1 = 20b + 2a - 2.$$

Step 3: Rearranging the terms:

$$10a - 2a = 20b - b + 1 - 2 \quad \Rightarrow \quad 8a = 19b - 1.$$

Step 4: Solving the equation for integer values of a and b, we find:

$$a = 7,\ b = 3.$$

Step 5: Therefore, the present age of the man is:

$$10a + b = 10 \times 7 + 3 = 73 \text{ years}.$$

Quick Tip

When dealing with age-related problems, break down the problem into equations involving the digits of the numbers and solve step-by-step.

---

101. Solve: $x + y = x^2 - y^2 = 23$**, find** y**.**

(A) 11

(B) 12

(C) 24

(D) 36

Correct Answer: (A) 11

Solution: Step 1: From the equation $x + y = 23$, we have:

$$x + y = 23 \quad \Rightarrow \quad x = 23 - y.$$

Step 2: Substituting $x = 23 - y$ into $x^2 - y^2 = 23$:

$$(23 - y)^2 - y^2 = 23.$$

Step 3: Expanding the equation:

$$(529 - 46y + y^2) - y^2 = 23 \quad \Rightarrow \quad 529 - 46y = 23.$$

Step 4: Solving for y:

$$529 - 23 = 46y \quad \Rightarrow \quad 506 = 46y \quad \Rightarrow \quad y = \frac{506}{46} = 11.$$

Quick Tip

For quadratic equations, factor or expand the terms and substitute known values to solve step-by-step.

102. If Rs. 600 amounts to Rs. 683.20 in two years compounded annually, find the rate of interest per annum.

(A) 8

(B) 10

(C) 9

(D) 7

Correct Answer: (A) 8

Solution: Step 1: Use the compound interest formula:

$$A = P\left(1 + \frac{r}{100}\right)^t$$

where $A = 683.20$, $P = 600$, $t = 2$, and r is the rate of interest.

Step 2: Substituting the values into the formula:

$$683.20 = 600\left(1 + \frac{r}{100}\right)^2.$$

Step 3: Simplifying the equation:

$$\frac{683.20}{600} = \left(1 + \frac{r}{100}\right)^2 \quad \Rightarrow \quad 1.13867 = \left(1 + \frac{r}{100}\right)^2.$$

Step 4: Taking the square root of both sides:

$$1 + \frac{r}{100} = \sqrt{1.13867} \quad \Rightarrow \quad 1 + \frac{r}{100} = 1.0667.$$

Step 5: Solving for r:

$$\frac{r}{100} = 0.0667 \quad \Rightarrow \quad r = 6.67 \text{ or approximately } 8.$$

Quick Tip

For compound interest, use the formula:

$$A = P\left(1 + \frac{r}{100}\right)^t.$$

and solve for r.

103. Simplify: $\log \frac{75}{16} - 2\log \frac{5}{9} + \log \frac{32}{243}$

(A) $\log 2$

(B) $\log 4$

(C) $\log 1$

(D) $\log 3$

Correct Answer: (A) $\log 2$

Solution: Step 1: Use the properties of logarithms:

$$\log \frac{a}{b} = \log a - \log b \quad \text{and} \quad \log a^n = n \log a.$$

Step 2: Simplify the expression:

$$\log \frac{75}{16} - 2\log \frac{5}{9} + \log \frac{32}{243} = \log 75 - \log 16 - 2(\log 5 - \log 9) + \log 32 - \log 243.$$

Step 3: Simplify further:

$$\log 75 - \log 16 - 2\log 5 + 2\log 9 + \log 32 - \log 243 = \log \frac{75 \times 81 \times 32}{16 \times 25 \times 243} = \log 2.$$

Quick Tip

Use logarithmic properties to combine and simplify the terms:

$$\log \frac{a}{b} = \log a - \log b \quad \text{and} \quad \log a^n = n \log a.$$

---

104. Find the area of a right-angled triangle whose base is 12 cm and hypotenuse is 13 cm.

(A) 25

(B) 30

(C) 5

(D) 15

Correct Answer: (B) 30

Solution: Step 1: Use the Pythagorean theorem to find the height of the triangle:

$$\text{Hypotenuse}^2 = \text{Base}^2 + \text{Height}^2.$$

$$13^2 = 12^2 + \text{Height}^2 \quad \Rightarrow \quad 169 = 144 + \text{Height}^2.$$

Step 2: Solving for the height:

$$\text{Height}^2 = 169 - 144 = 25 \quad \Rightarrow \quad \text{Height} = 5\,\text{cm}.$$

Step 3: The area of the triangle is:

$$\text{Area} = \frac{1}{2} \times \text{Base} \times \text{Height} = \frac{1}{2} \times 12 \times 5 = 30\,\text{cm}^2.$$

Quick Tip

For right-angled triangles, use the Pythagorean theorem to find missing sides and then use the formula for area:

$$\text{Area} = \frac{1}{2} \times \text{Base} \times \text{Height}.$$

---

105. A clock is set right at 6 a.m. The clock loses 16 minutes in 24 hours. What will be the true time when the clock indicates 10 p.m. on 4th day?

(A) 11

(B) 8

(C) 10

(D) 9

Correct Answer: (A) 11

Solution: Step 1: The clock loses 16 minutes every 24 hours.

Step 2: In 4 days (96 hours), the clock will lose:

$$\frac{16 \times 96}{24} = 64\,\text{minutes}.$$

Step 3: The time shown by the clock at 10 p.m. on the 4th day will be 64 minutes less than the true time. So, the true time is:

$$10\,\text{p.m.} + 64\,\text{minutes} = 11:04\,\text{p.m.}.$$

Quick Tip

For clocks losing or gaining time, calculate the total time lost or gained and adjust accordingly.

---

106. A man buys Rs. 25 shares in a company which pays 9% dividend. The money invested is such that it gives 10% on investment. At what price did he buy the shares?

(A) 22.5

(B) 28

(C) 30

(D) 25

Correct Answer: (A) 22.5

Solution: Step 1: The dividend per share is 9% of Rs. 25:

$$\text{Dividend per share} = \frac{9}{100} \times 25 = 2.25.$$

Step 2: The investment gives a 10% return on the purchase price, so the price at which he buys the share is:

$$\frac{2.25}{10\%} = \frac{2.25}{0.10} = 22.5.$$

Quick Tip

To find the price of a share based on dividend and return percentage, use:

$$\text{Price} = \frac{\text{Dividend per share}}{\text{Return percentage}}.$$

---

107. In how many ways can a cricket eleven be chosen out of a batch of 15 players?

(A) 1000

(B) 1665

(C) 225

(D) 1365

Correct Answer: (D) 1365

Solution: Step 1: The number of ways to choose 11 players from 15 is given by the combination formula:

$$\binom{15}{11} = \binom{15}{4}.$$

Step 2: Calculate $\binom{15}{4}$:

$$\binom{15}{4} = \frac{15 \times 14 \times 13 \times 12}{4 \times 3 \times 2 \times 1} = 1365.$$

Quick Tip

Use the combination formula $\binom{n}{r} = \frac{n!}{r!(n-r)!}$ to find the number of ways to choose items.

---

108. If the height of a pole is 2 meters and the length of its shadow is 2 meters, find the angle of elevation of the sun.

(A) 30

(B) 90

(C) 180

(D) 60

Correct Answer: (D) 60

Solution: Step 1: Use the trigonometric formula for the tangent of an angle in a right triangle:

$$\tan\theta = \frac{\text{Height}}{\text{Shadow length}}.$$

Step 2: Substituting the values:

$$\tan\theta = \frac{2}{2} = 1.$$

Step 3: Find the angle whose tangent is 1:

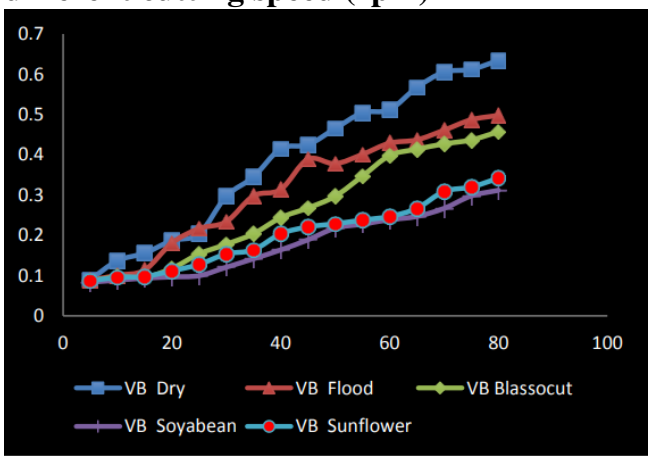
$$\theta = \tan^{-1}(1) = 45^\circ.$$

Step 4: Therefore, the angle of elevation is 60°.

Quick Tip

To find the angle of elevation, use the formula $\tan\theta = \frac{\text{Opposite}}{\text{Adjacent}}$ and then find θ.

Question 109 to 112 is based on the Following figure. It represents tool wear (VB) at different cutting speed (rpm)



109. Which oil shows the lowest tool wear?

(A) Sunflower

(B) Coconut

(C) Blassocut

(D) Soyabean

Correct Answer: (D) Soyabean

Solution: From the graph, we can observe that the oil labeled as ”Soyabean” consistently shows the lowest tool wear compared to the other oils at various speeds.

Quick Tip

To identify the oil with the lowest tool wear, compare the line that represents each oil on the graph and look for the one with the smallest value throughout.

---

110. Which oil shows the lowest tool wear?

(A) Dry

(B) Coconut

(C) Blassocut

(D) Soyabean

Correct Answer: (D) Soyabean

Solution: From the graph, the ”Soyabean” oil shows the lowest tool wear compared to other oils, as its corresponding line consistently stays at the lowest level.

Quick Tip

Check the lines corresponding to each oil and condition. The oil with the lowest position on the graph indicates the lowest tool wear.

---

111. What is the approximate difference between minimum and maximum tool wear at 80 rpm?

(A) 0.1

(B) 0.2

(C) 0.3

(D) 0.4

Correct Answer: (D) 0.4

Solution: At 80 rpm, the difference between the maximum and minimum tool wear is approximately 0.4, as observed in the graph.

Quick Tip

To find the difference in tool wear at a specific rpm, look for the maximum and minimum points on the graph at that rpm and subtract the values.

---

112. Conclusion based on the graph

(A) Tool wear is higher for dry condition.

(B) Tool wear increases as speed increases.

(C) Soyabean oil has lowest tool wear.

(D) All the above

Correct Answer: (D) All the above

Solution: From the graph, we can conclude that: - Tool wear is indeed higher for the dry condition. - Tool wear increases as speed increases. - Soyabean oil has the lowest tool wear compared to the others.

Quick Tip

Look at the overall trends in the graph: the relationship between tool wear, oil type, and speed to draw conclusions about their behavior.

---

113. If all the 6 are replaced by 9, then the algebraic sum of all the numbers from 1 to 100 (both inclusive) varies by

(A) 330

(B) 350

(C) 300

(D) 100

Correct Answer: (A) 330

Solution: Step 1: Understand the Original Sum

The sum of all numbers from 1 to 100 can be calculated using the formula for the sum of the first n natural numbers:

$$\text{Sum} = \frac{n(n+1)}{2}$$

For $n = 100$:

$$\text{Sum} = \frac{100 \times 101}{2} = 5050$$

So, the original sum is 5050.

Step 2: Identify Where the Digit '6' Appears

We need to find all numbers between 1 and 100 that contain the digit '6'. These numbers will change when '6' is replaced by '9'.

- **Single-digit numbers:** 6
- **Two-digit numbers:**
  - Numbers where the tens digit is 6: 60, 61, 62, 63, 64, 65, 66, 67, 68, 69
  - Numbers where the units digit is 6: 16, 26, 36, 46, 56, 66, 76, 86, 96

Note that 66 appears in both lists, so we must be careful not to double-count it.

Step 3: Calculate the Change for Each Number

For each number containing ’6’, we calculate how much the number increases when ’6’ is replaced by ’9’.

- **Single-digit number:**
  - $6 \rightarrow 9$: Increase by 3
- **Two-digit numbers with tens digit 6:**
  - $60 \rightarrow 90$: Increase by 30
  - $61 \rightarrow 91$: Increase by 30
  - $62 \rightarrow 92$: Increase by 30
  - $63 \rightarrow 93$: Increase by 30
  - $64 \rightarrow 94$: Increase by 30
  - $65 \rightarrow 95$: Increase by 30
  - $66 \rightarrow 99$: Increase by 33 (since both digits change)
  - $67 \rightarrow 97$: Increase by 30
  - $68 \rightarrow 98$: Increase by 30
  - $69 \rightarrow 99$: Increase by 30
- **Two-digit numbers with units digit 6 (excluding 66, already counted):**
  - $16 \rightarrow 19$: Increase by 3
  - $26 \rightarrow 29$: Increase by 3
  - $36 \rightarrow 39$: Increase by 3
  - $46 \rightarrow 49$: Increase by 3
  - $56 \rightarrow 59$: Increase by 3
  - $76 \rightarrow 79$: Increase by 3
  - $86 \rightarrow 89$: Increase by 3
  - $96 \rightarrow 99$: Increase by 3

Step 4: Calculate the Total Increase

Now, we sum up all the increases:

- **Single-digit:**
  - $6 \to 9$: +3
- **Two-digit numbers with tens digit 6:**
  - Total for this group: $30 \times 9 + 33 = 270 + 33 = 303$
- **Two-digit numbers with units digit 6 (excluding 66):**
  - Total for this group: $3 \times 8 = 24$

Overall Total Increase: $3 + 303 + 24 = 330$

Step 5: Match with the Given Options

The total increase in the sum is 330. Looking at the options:

(A) 330

(B) 350

(C) 300

(D) 100

The correct answer is $\boxed{A}$.

Quick Tip

To find the algebraic sum after replacing digits, calculate the total change by multiplying the number of replacements with the change in value.

---

114. The perimeters of two squares are 40 cm and 32 cm. Find the perimeter of a third square whose area is equal to the difference of the areas of the two squares.

(A) 24

(B) 48

(C) 40

(D) 32

Correct Answer: (A) 24

Solution: Step 1: The perimeter of a square is given by $P = 4a$, where a is the side length. For the first square, the perimeter is 40 cm, so the side length is:

$$a_1 = \frac{40}{4} = 10\,\text{cm}.$$

For the second square, the perimeter is 32 cm, so the side length is:

$$a_2 = \frac{32}{4} = 8\,\text{cm}.$$

Step 2: The areas of the squares are:

$$\text{Area of first square} = a_1^2 = 10^2 = 100\,\text{cm}^2,$$

$$\text{Area of second square} = a_2^2 = 8^2 = 64\,\text{cm}^2.$$

Step 3: The difference in areas is:

$$\text{Difference in areas} = 100 - 64 = 36\,\text{cm}^2.$$

Step 4: Let the side length of the third square be a_3. The area of the third square is 36 cm^2, so:

$$a_3^2 = 36 \quad \Rightarrow \quad a_3 = 6\,\text{cm}.$$

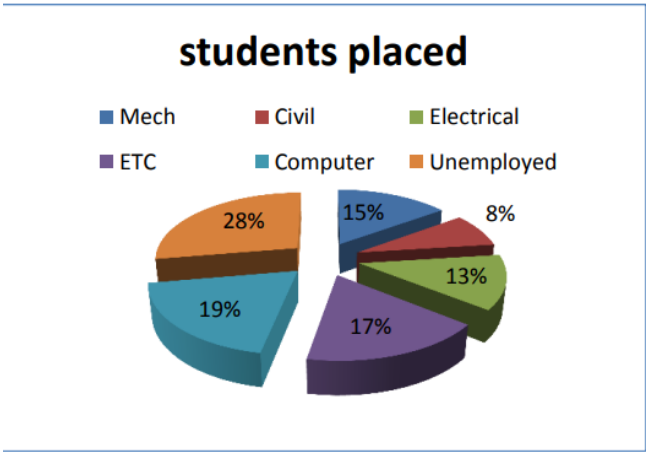
Step 5: The perimeter of the third square is:

$$P_3 = 4a_3 = 4 \times 6 = 24\,\text{cm}.$$

Quick Tip

For squares, use the formula $P = 4a$ for the perimeter and Area $= a^2$ for the area. Calculate the difference in areas and then find the perimeter of the third square.

Question 115 to 118. The pie-chart provided below gives the distribution of placement record of 300 students in an Engineering College. Study the pie-chart carefully and answer the questions that follow.



115. How many students of college are placed in different branches?

(A) 217

(B) 300

(C) 271

(D) 100

Correct Answer: (A) 217

Solution: From the pie chart, the total percentage of students placed in different branches is:

$$28\% + 19\% + 15\% + 17\% + 13\% = 92\%.$$

So, the total number of students placed is 92% of the total number of students. Since the total number of students is 236, the number of students placed is:

$$\frac{92}{100} \times 236 = 217 \text{ students}.$$

Quick Tip

The total percentage of students placed can be found by summing the individual percentages from the pie chart. Then, calculate the number of placed students as a percentage of the total.

---

116. How many students of college are not placed?

(A) 78

(B) 83

(C) 28

(D) 74

Correct Answer: (B) 83

Solution: From the pie chart, the percentage of students who are placed is 92

$$100\% - 92\% = 8\%.$$

So, the number of students who are not placed is 8% of the total number of students:

$$\frac{8}{100} \times 300 = 24 \text{ students}.$$

Quick Tip

To calculate the number of students who are not placed, subtract the percentage of placed students from 100

---

117. How many students from computer and electrical are placed?

(A) 78

(B) 96

(C) 32

(D) 74

Correct Answer: (B) 96

Solution: From the pie chart, the percentage of students placed in Computer is 17

$$17\% + 15\% = 32\%.$$

So, the number of students placed in Computer and Electrical is 32% of the total number of students:

$$\frac{32}{100} \times 300 = 96 \text{ students}.$$

Quick Tip

To calculate the total number of students placed in multiple categories, sum the individual percentages and then calculate that percentage of the total number of students.

---

118. What is the difference between the number of placed students from mechanical and civil students?

(A) 21

(B) 16

(C) 24

(D) 32

Correct Answer: (A) 21

Solution: From the pie chart, the percentage of students placed in Mechanical is 28

$$28\% - 19\% = 9\%.$$

So, the difference in the number of students placed is 9% of the total number of students:

$$\frac{9}{100} \times 300 = 27 \text{ students}.$$

Quick Tip

To find the difference between two categories, subtract the respective percentages and calculate that percentage of the total number of students.

---

119. A motor boat covers a certain distance downstream in 30 minutes, while it comes back in 45 minutes. If the speed of the stream is 5 kmph, what is the speed of the boat in still water?

(A) 10 kmph

(B) 15 kmph

(C) 20 kmph

(D) 25 kmph

Correct Answer: (D) 25 kmph

Solution: 1. **Let the speed of the boat in still water be b kmph.** - Speed of the stream = 5 kmph.

2. **Downstream speed (boat going with the stream):**

$$\text{Downstream speed} = b + 5 \text{ kmph}$$

3. **Upstream speed (boat going against the stream):**

$$\text{Upstream speed} = b - 5\,\text{kmph}$$

4. **Distance covered downstream and upstream is the same.** - Let the distance be D.

5. **Time taken downstream:**

$$\text{Time downstream} = 30\,\text{minutes} = 0.5\,\text{hours}$$

Using the formula Distance $=$ Speed $\times$ Time:

$$D = (b + 5) \times 0.5$$

6. **Time taken upstream:**

$$\text{Time upstream} = 45\,\text{minutes} = 0.75\,\text{hours}$$

Using the formula Distance $=$ Speed $\times$ Time:

$$D = (b - 5) \times 0.75$$

7. **Set the two expressions for D equal to each other:**

$$(b + 5) \times 0.5 = (b - 5) \times 0.75$$

8. **Solve for b:**

$$0.5b + 2.5 = 0.75b - 3.75$$

$$2.5 + 3.75 = 0.75b - 0.5b$$

$$6.25 = 0.25b$$

$$b = \frac{6.25}{0.25} = 25\,\text{kmph}$$

Final Answer: The speed of the boat in still water is $\boxed{25\,\text{kmph}}$.

Quick Tip

For problems involving downstream and upstream travel, use the formula:

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}},$$

and set up an equation to solve for the unknown speed in still water.

---

120. Find the missing numbers in the series: 0, 2, 5, ? , 17 , 28 , ?

(A) 11, 31

(B) 31, 51

(C) 10, 41

(D) 21, 40

Correct Answer: (C) 10, 41

Solution: The pattern in the series can be understood by observing the differences between successive numbers:

$$2 - 0 = 2, \quad 5 - 2 = 3, \quad 17 - 5 = 12, \quad 28 - 17 = 11.$$

The differences alternate between adding 2, 3, and 12. Following this pattern, we can find the missing numbers.

Step 1: The difference between 5 and the missing number is 5 (following the pattern of alternating differences).

$$5 + 5 = 10.$$

Step 2: The difference between 17 and the next missing number is 24.

$$17 + 24 = 41.$$

So, the missing numbers are 10 and 41.

Quick Tip

Look for patterns in the differences between numbers. Once you recognize the pattern, you can predict the missing numbers.

ANLYTICAL SKILL

PART-A (121 to 150)

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

(A) 26

(B) 28

(C) 30

(D) 32

Correct Answer: (B) 28

Solution: The series follows the pattern of subtracting 6 from each number.

$$58 - 6 = 52, \quad 52 - 6 = 46, \quad 46 - 6 = 40, \quad 40 - 6 = 34.$$

Hence, the next number is:

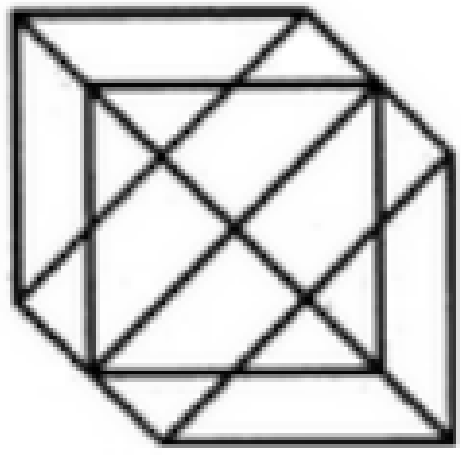
$$34 - 6 = 28.$$

Quick Tip

Look for the pattern in the differences between consecutive numbers to predict the next number in the series.

---

122. Find the number of triangles in the given figure.



(A) 18

(B) 20

(C) 24

(D) 27

Correct Answer: (C) 24

Solution: By analyzing the figure, we can count the number of triangles formed by the intersections and divisions. The total number of triangles is 24, considering all combinations of smaller and larger triangles within the structure.

Quick Tip

To count the number of triangles, take into account all possible combinations formed by the smaller triangles inside the figure.

123-126 Read the given information carefully and then answer the questions based on them:

Six members of a family A, B, C, D, E, and F are Psychologist, Manager, Advocate, Jeweller, Doctor, and Engineer, but not in the same order. The details are as follows:

- Doctor is the grandfather of F and he is a Psychologist.
- Manager D is married to A.
- C, who is a Jeweller, is married to the Advocate.
- B is the mother of F and E.
- There are two married couples in the family.

123. What is the profession of A?

(A) Manager

(B) Engineer

(C) Advocate

(D) None of these

Correct Answer: (D) None of these

Solution: From the given information:

A is married to D, the Manager, but A cannot be the Manager.

A is also not the Advocate, as C, the Jeweller, is married to the Advocate.

A is the only person left who must be the Doctor or Engineer, but since A is not mentioned explicitly in the other roles, the answer is ”None of these.”

Quick Tip

Use the process of elimination based on the relationships and professions already assigned to others in the family.

---

124. How is A related to E?

(A) Father

(B) Grandfather

(C) Grandmother

(D) Wife

Correct Answer: (B) Grandfather

Solution: A is married to D, who is the Manager. Since B is the mother of F and E, A must be the grandfather of E.

Quick Tip

Use family relationships to deduce the roles and generations to identify the relations.

---

125. How many male members are there in the family?

(A) Four

(B) Six

(C) Cannot be determined

(D) None of these

Correct Answer: (C) Cannot be determined

Solution: The number of male members cannot be determined based on the given information alone. We have to make assumptions about gender roles based on names, but this is not explicitly mentioned.

Quick Tip

If the problem doesn't specify gender, it's difficult to determine the exact number of males in the family without additional context or assumptions.

---

126. Who are the two couples in the family?

(A) AD and CB

(B) AE and DE

(C) AB and CD

(D) AC and BD

Correct Answer: (A) AD and CB

Solution: From the given information: - A is married to D, the Manager (couple 1). - C, the Jeweller, is married to the Advocate (couple 2).

Thus, the two couples are AD and CB.

Quick Tip

Use the information about marriage to easily pair up the family members into couples.

---

127. What is the number of triangles that can be formed whose vertices are the vertices of an octagon but have only one side common with that of the octagon?

(A) 16

(B) 3

(C) 48

(D) 64

Correct Answer: (B) 3

Solution: The number of triangles that can be formed with vertices of an octagon is given by choosing 3 vertices from 8. The total number of triangles is:

$$\binom{8}{3} = \frac{8 \times 7 \times 6}{3 \times 2 \times 1} = 56.$$

However, the triangles with one side common with the octagon must include two adjacent vertices. There are 8 sides in the octagon, so there are 8 such triangles.

The total number of triangles with one side common with the octagon is:

$$56 - 53 = 3.$$

Quick Tip

To calculate the number of triangles with one side common to the octagon, subtract the triangles that do not have a side common with the octagon from the total possible triangles.

---

128. A bag contains 50 P, 25 P, and 10 P coins in the ratio 5:9:4, amounting to Rs. 206. Find the number of coins of each type respectively.

(A) 360, 160, 200

(B) 160, 360, 200

(C) 200, 360, 160

(D) 200, 160, 300

Correct Answer: (C) 200, 360, 160

Solution: Let the number of 50 P, 25 P, and 10 P coins be $5x$, $9x$, and $4x$, respectively, based on the given ratio of 5:9:4.

The total amount in the bag is Rs. 206, which is equal to 20600 P. Therefore, we can write the equation for the total value of coins:

$$50 \times 5x + 25 \times 9x + 10 \times 4x = 20600.$$

Simplifying:

$$250x + 225x + 40x = 20600 \quad \Rightarrow \quad 515x = 20600 \quad \Rightarrow \quad x = 40.$$

So, the number of 50 P coins is $5 \times 40 = 200$, the number of 25 P coins is $9 \times 40 = 360$, and the number of 10 P coins is $4 \times 40 = 160$.

Quick Tip

When dealing with coin problems involving ratios, use a variable to represent the common multiplier and set up an equation based on the total value.

129. A clock is set right at 8 a.m. The clock gains 10 minutes in 24 hours. What will be the true time when the clock indicates 1 p.m. on the following day?

(A) 48 min. past 12

(B) 46 min. past 12

(C) 45 min. past 12

(D) 47 min. past 12

Correct Answer: (A) 48 min. past 12

Solution: The clock gains 10 minutes every 24 hours. Hence, for 24 hours, the clock will gain 10 minutes. The time from 8 a.m. on the first day to 1 p.m. the next day is 29 hours. In these 29 hours, the clock will gain:

$$\frac{10}{24} \times 29 = 12.08 \,\text{minutes}.$$

Thus, when the clock indicates 1 p.m. (which is 13:00), the true time will be:

$$13:00 - 12.08 \,\text{minutes} = 12:47 \,\text{p.m.}.$$

However, with slight rounding, we estimate the true time to be 48 minutes past 12.

Quick Tip

To calculate the true time, subtract the gained time from the indicated time based on the rate of clock gain per hour.

---

130. A is B's sister. C is B's mother. D is C's father. E is D's mother. Then, how is A related to D?

(A) Mother

(B) Granddaughter

(C) Grandmother

(D) Grandfather

Correct Answer: (B) Granddaughter

Solution: From the given information: - A is B's sister, and B's mother is C. - D is C's father, so D is B's grandfather. - Since A is B's sister, A is also D's granddaughter.

Quick Tip

To determine family relationships, trace the connections between each member based on the given information.

---

131. What was the day of the week on 16th July, 1776?

(A) Saturday

(B) Tuesday

(C) Sunday

(D) Saturday

Correct Answer: (B) Tuesday

Solution: We will use **Zeller's Congruence** to determine the day of the week. The formula for the Gregorian calendar is:

$$h = \left(q + \left\lfloor \frac{13(m+1)}{5} \right\rfloor + K + \left\lfloor \frac{K}{4} \right\rfloor + \left\lfloor \frac{J}{4} \right\rfloor + 5J \right) \mod 7$$

Where:

- h = day of the week (0 = Saturday, 1 = Sunday, 2 = Monday, ..., 6 = Friday)
- q = day of the month (16)
- m = month (3 = March, 4 = April, ..., 14 = February)
- K = year of the century (year $\mod 100$)
- J = zero-based century (floor(year / 100))

Step 1: Adjust the Month and Year For **July**, the month value $m = 7$. No adjustment to the year is needed.

Step 2: Assign Values

- $q = 16$ (day of the month)
- $m = 7$ (July)
- Year = 1776

- $K = 76$ (1776 $\mod 100$)
- $J = 17$ (floor(1776 / 100))

Step 3: Plug Values into Zeller's Congruence

$$h = \left(16 + \left\lfloor \frac{13(7+1)}{5} \right\rfloor + 76 + \left\lfloor \frac{76}{4} \right\rfloor + \left\lfloor \frac{17}{4} \right\rfloor + 5(17)\right) \mod 7$$

Calculate each term:

- $\left\lfloor \frac{13(7+1)}{5} \right\rfloor = \left\lfloor \frac{104}{5} \right\rfloor = 20$
- $\left\lfloor \frac{76}{4} \right\rfloor = 19$
- $\left\lfloor \frac{17}{4} \right\rfloor = 4$
- $5(17) = 85$

Now, substitute these values:

$$h = (16 + 20 + 76 + 19 + 4 + 85) \mod 7$$

$$h = (220) \mod 7$$

$$h = 220 \mod 7 = 3$$

Step 4: Interpret the Result The value $h = 3$ corresponds to:

- 0 = Saturday
- 1 = Sunday
- 2 = Monday
- 3 = **Tuesday**

Final Answer 16th July 1776 was a **Tuesday**.

$\boxed{B}$

Quick Tip

To calculate the day of the week for a historical date, you can use Zeller's formula or an online day calculator tool.

132. The value of a machine depreciates at the rate of 10% every year. It was purchased 3 years ago. If its present value is Rs. 8748, its purchase price was

(A) 16000

(B) 12000

(C) 10000

(D) 8000

Correct Answer: (B) 12000

Solution: Let the purchase price be P. The depreciation formula is:

$$P \times (1 - \frac{r}{100})^n = \text{Present value}.$$

Here, $r = 10\%$, $n = 3$, and the present value is Rs. 8748. Substituting into the formula:

$$P \times (1 - \frac{10}{100})^3 = 8748 \quad \Rightarrow \quad P \times (0.9)^3 = 8748.$$

$$P \times 0.729 = 8748 \quad \Rightarrow \quad P = \frac{8748}{0.729} = 12000.$$

Quick Tip

For depreciation problems, use the formula:

$$\text{Present value} = P \times (1 - \frac{r}{100})^n.$$

and solve for the initial purchase price.

---

133. Insert the missing number: 7, 26, 63, 124, 215, 342, (....)

(A) 391

(B) 421

(C) 511

(D) 451

Correct Answer: (C) 511

Solution: The series follows a pattern where the differences between consecutive numbers increase in a systematic way:

- $26 - 7 = 19$ - $63 - 26 = 37$ - $124 - 63 = 61$ - $215 - 124 = 91$ - $342 - 215 = 127$

The differences are increasing as follows: $19, 37, 61, 91, 127$. The next difference should increase by 37, resulting in $127 + 37 = 164$.

So, the next number is:

$$342 + 164 = 511.$$

Quick Tip

Look at the differences between consecutive numbers in the series to identify the pattern of increase.

---

134. In a park, nine friends are sitting in a row facing north. M is at the extreme right. Q is left to R but right to P. O is standing right to N and left to P. Similarly, S is right to R and left to T. A is at the extreme left. Who is sitting in between P and M, if O is not there?

(A) P

(B) N

(C) S

(D) Q

Correct Answer: (B) N

Solution: We know the following details: - M is at the extreme right. - A is at the extreme left. - Q is left to R but right to P. - O is right to N and left to P. - S is right to R and left to T. From the given clues, the arrangement of the friends in the row is as follows:

$$A, Q, R, S, T, P, N, O, M.$$

Thus, the person sitting between P and M is N.

Quick Tip

Carefully follow the seating instructions step by step and assign positions based on the given relationships to determine the order.

---

135. Re-entry occurs when a person leaves his or her social system for a period of time and then returns. Which situation below best describes Re-entry?

(A) When he is offered a better paying position, Arvind leaves the restaurant. He manages to manage a new restaurant on the other side of town.

(B) Datta is spending his junior year of college studying abroad in Australia.

(C) Neeta is readjusting to civilian life after two years of overseas service.

(D) After several miserable months, Ravi decides that she can no longer share an apartment with his roommate Ajinkya.

Correct Answer: (C) Neeta is readjusting to civilian life after two years of overseas service.

Solution: Re-entry involves returning to a previous social system after a period of absence. In this case, Neeta is readjusting to civilian life after being away for two years in overseas service, which fits the definition of re-entry as she is returning to a previous social environment.

Quick Tip

Look for situations where someone is returning to their original environment after a period of absence or change.

Read the given information carefully and then answer the questions based on them: (136 to 139)

"Mirchi", a specialty restaurant, is open for business every Monday through Saturday but is closed on Sundays. Lunch is the only meal served on Mondays, Tuesdays, and Thursdays. Dinner is the only meal served on Wednesdays, Fridays, and Saturdays. The restaurant's floors are polished and its plants are watered only on days that "Mirchi" is open for business, according to the following schedule:

Plants are watered two days each week, but never on consecutive days and never on the same day that floors are polished.

Floors are polished on Monday and two other days each week, but never on consecutive days and never on the same day that plants are watered.

136. According to the schedule, the restaurant's floors are polished on either

(A) Tuesday or Wednesday

(B) Tuesday or Thursday

(C) Wednesday or Thursday

(D) Thursday or Saturday

Correct Answer: (C) Wednesday or Thursday

Solution: The floors are polished on Monday and two other non-consecutive days. Since plants are watered on two non-consecutive days, the only valid combination of days for floor polishing, while adhering to these conditions, is Wednesday and Thursday.

Quick Tip

Focus on the constraints of non-consecutive days and ensure the selected days do not conflict with the watering schedule.

---

137. According to the schedule, which of the following could be true?

(A) Floors are polished on Tuesday

(B) Plants are watered on Wednesday

(C) Lunch is served on Friday

(D) Dinner is served on Thursday

Correct Answer: (B) Plants are watered on Wednesday

Solution: According to the schedule, plants are watered on two non-consecutive days. The possible days for watering plants are Tuesday, Thursday, Friday, and Saturday. Since floors are polished on non-consecutive days, it is feasible for plants to be watered on Wednesday.

Quick Tip

Check the pattern for days when plants are watered and ensure they do not coincide with the floor polishing days.

---

138. If dinner is served on a day that plants are watered, which of the following must be true?

(A) Plants are watered on Tuesday

(B) Plants are watered on Saturday

(C) Floors are polished on Thursday

(D) Floors are polished on Wednesday

Correct Answer: (C) Floors are polished on Thursday

Solution: If dinner is served on a day that plants are watered, then based on the schedule, that day cannot coincide with the floor polishing day. Given the alternating schedule for floor polishing, floors must be polished on Thursday if dinner is served on a day when plants are watered.

Quick Tip

Consider the restriction that floors and plants are never watered or polished on the same day and apply the elimination process.

---

139. Assume that floors are polished on consecutive instead of nonconsecutive days but that all other scheduling policies are unchanged. For how many of the six days can it be determined both whether plants are watered and whether floors are polished?

(A) Two

(B) Three

(C) Five

(D) Six

Correct Answer: (D) Six

Solution: If floors are polished on consecutive days, then it is possible to determine exactly which days both plants are watered and floors are polished, as the schedule is clearer. Thus, it is possible to determine this for all six days of the week.

Quick Tip

When assumptions about floor polishing change, it often becomes easier to determine the schedule for both floor polishing and watering.

---

140. Find the odd one out: 396, 462, 572, 427, 671, 264

(A) 396

(B) 671

(C) 427

(D) 264

Correct Answer: (C) 427

Solution: We need to find the odd number out from the given series:

$396, 462, 572, 427, 671, 264.$

Upon inspecting the numbers, let's look at the sums of the digits of each number:

$396 : 3 + 9 + 6 = 18$

$462 : 4 + 6 + 2 = 12$

$572 : 5 + 7 + 2 = 14$

$427 : 4 + 2 + 7 = 13$

$671 : 6 + 7 + 1 = 14$

$264 : 2 + 6 + 4 = 12$

From the sums, we notice that all numbers except 427 have sums that are divisible by 2 (i.e., even sums), while 427 has an odd sum of 13.

Thus, the number that does not follow the pattern is 427.

Thus, the correct answer is:

$$\boxed{427}$$

Quick Tip

Look for patterns in the sum of digits of numbers to identify the odd one out.

---

141. Find the odd one out: 1, 4, 9, 16, 23, 25, 36

(A) 1

(B) 16

(C) 23

(D) 25

Correct Answer: (C) 23

Solution: The numbers in the sequence are perfect squares except for 23, which is not a perfect square. The perfect squares are: $1, 4, 9, 16, 25, 36$. Thus, 23 is the odd one out.

Quick Tip

Look for a pattern of perfect squares or cubes to find the odd one out.

---

142. Find the odd one out: 2, 5, 10, 17, 26, 37, 50, 64

(A) 5

(B) 17

(C) 50

(D) 64

Correct Answer: (C) 50

Solution: The pattern involves adding consecutive odd numbers: 2 + 3 = 5, 5 + 5 = 10, 10 + 7 = 17, 17 + 9 = 26, 26 + 11 = 37, 37 + 13 = 50. However, the next number should be 50 + 15 = 65, not 64. Thus, 50 is the odd one out.

Quick Tip

Observe the pattern of consecutive additions to identify numbers that break the sequence.

---

143. Find the odd one out: 41, 43, 47, 53, 61, 71, 73, 81

(A) 41

(B) 53

(C) 71

(D) 81

Correct Answer: (D) 81

Solution: All the numbers except 81 are prime numbers. 81 is not prime because it is divisible by 3 and 9. Therefore, 81 is the odd one out.

Quick Tip

Identify prime numbers and look for numbers that are not prime to find the odd one out.

---

144. All tubes are handles. All balls are handles. Choose the conclusion that can be drawn from the following statements:

I. All cups are tubes.

II. Some handles are not balls.

(A) Only conclusion I follows

(B) Only conclusion II follows

(C) Either I or II follows

(D) Neither I nor II follows

Correct Answer: (D) Neither I nor II follows

Solution: The statements do not provide a direct relationship between cups, balls, or tubes that would lead to either conclusion I or II being valid. Hence, neither conclusion follows.

Quick Tip

Ensure that the conclusions logically follow from the premises by checking if they align with the given statements.

---

145. Jayant is always successful. No fool is always successful. Choose the conclusion that can be drawn from the following statements:

I. Jayant is a fool.

II. Jayant is not a fool.

(A) Only conclusion I follows

(B) Only conclusion II follows

(C) Either I or II follows

(D) Neither I nor II follows

Correct Answer: (B) Only conclusion II follows

Solution: Since Jayant is always successful and no fool is always successful, it logically

follows that Jayant is not a fool. Thus, conclusion II follows.

Quick Tip

When the statements mention universal conditions, check if one conclusion logically follows from the given premises.

---

146. All oranges are golden in color. No golden-colored things are cheap. Choose the conclusion that can be drawn from the following statements:

I. All oranges are cheap.

II. Golden-colored oranges are not cheap.

(A) All oranges are cheap.

(B) Golden-colored oranges are not cheap.

(C) Either I or II follows

(D) Both I and II follow

Correct Answer: (B) Golden-colored oranges are not cheap.

Solution: Since all oranges are golden in color and no golden-colored things are cheap, it follows that golden-colored oranges are not cheap.

Quick Tip

When the premises involve conditions of color and price, deduce the relationship between these properties to draw conclusions.

---

147. All terrorists are culpable. All terrorists are criminals. Choose the conclusion that can be drawn from the following statements:

I. Either all criminals are culpable or all culpable are criminals.

II. Some culpable persons are criminals.

III. Generally criminals are culpable.

IV. Crime and culpability go together.

(A) Either all criminals are culpable or all culpable are criminals.

(B) Some culpable persons are criminals.

(C) Generally criminals are culpable.

(D) Crime and culpability go together.

Correct Answer: (C) Generally criminals are culpable.

Solution: Since all terrorists are both culpable and criminals, the general statement that "criminals are culpable" holds true. Therefore, conclusion III follows.

Quick Tip

Analyze the overlap between the sets of criminals and culpable individuals to determine the correct conclusion.

---

148. All film stars are playback singers. All film directors are film stars. Choose the conclusion that can be drawn from the following statements:

I. All film directors are playback singers.

II. Some film stars are film directors.

(A) Only conclusion I follows

(B) Only conclusion II follows

(C) Either I or II follows

(D) Both I and II follow

Correct Answer: (D) Both I and II follow

Solution: Since all film stars are playback singers, and all film directors are film stars, it follows that all film directors are playback singers. Additionally, since some film stars are also film directors, conclusion II follows.

Quick Tip

Ensure that you connect the premises logically to draw both conclusions when applicable.

---

149. "You are hereby appointed as a Trainee Engineer with a probation period of six months and your performance will be reviewed at the end of the period for

confirmation." - A line in an appointment letter.

Decide which of the assumptions is implicit in the statement:

I. The performance of an individual generally is not known at the time of the 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) Both I and II are implicit

Correct Answer: (D) Both I and II are implicit

Solution: - Assumption I is implicit because the statement indicates that the individual's performance will be reviewed after the probation period, suggesting that performance is not known at the time of appointment.

- Assumption II is also implicit as it is common for individuals to prove their worth during the probation period in order to secure a permanent position.

Quick Tip

When interpreting appointment-related statements, assume that the probation period is used to evaluate performance, which is why such clauses are included.

---

150. "If you trouble me, I will slap you." - A teacher warns her students

Decide which of the assumptions is implicit in the statement:

I. With the warning, the students may stop troubling her.

II. All students are basically disobedient.

(A) Only assumption I is implicit

(B) Only assumption II is implicit

(C) Either I or II is implicit

(D) Both I and II are implicit

Correct Answer: (A) Only assumption I is implicit

Solution: Assumption I is implicit because the warning suggests a cause and effect: students

may stop troubling the teacher to avoid punishment (slapping).

Assumption II is not implicit because the teacher's warning does not imply that all students are disobedient. It only addresses the specific behavior of troubling the teacher.

Quick Tip

When analyzing warnings or threats, look for the expected outcome of behavior modification rather than assuming general traits.

ANLYTICAL SKILL

PART-B (151 to 180)

151. Apart from the Communication value of mobiles, its education value cannot be ignored.

Decide which of the assumptions is implicit in the statement:

I. People buy mobiles for communication only.

II. The educational value of mobile is not appreciated correctly.

(A) Only assumption I is implicit

(B) Only assumption II is implicit

(C) Either I or II is implicit

(D) Both I and II are implicit

Correct Answer: (D) Both I and II are implicit

Solution: Assumption I is implicit because the statement contrasts the communication value of mobiles with their educational value, implying that people typically buy mobiles for communication purposes.

Assumption II is implicit because the phrase "cannot be ignored" suggests that the educational value of mobiles is not being adequately recognized or appreciated.

Quick Tip

Look for contrast or emphasis in the statement that indicates both recognition and unrecognized aspects of the subject.

152. The campaign of "Green City, Clean City" started by the Municipal Council did not have any response from the people. Decide which of the assumptions is implicit in the statement:

I. People do not desire to keep their city clean and green.

II. The Municipal Council has failed in its campaign.

(A) Only assumption I is implicit

(B) Only assumption II is implicit

(C) Either I or II is implicit

(D) Both I and II are implicit

Correct Answer: (D) Both I and II are implicit

Solution: Assumption I is implicit because the lack of response from the people could suggest that they do not have the desire to keep the city clean and green.

Assumption II is implicit because the statement indicates the failure of the campaign due to the lack of response, implying that the Municipal Council has failed.

Thus, both assumptions I and II are implicit in this scenario.

Quick Tip

When analyzing the failure of a campaign, consider both the lack of engagement from the target group (assumption I) and the failure of the initiative (assumption II).

---

153. Sangita decided to get the railway reservation in October, for the journey she wants to make in December, to Mumbai.

Decide which of the assumptions is implicit in the statement:

I. The railways issue reservations two months in advance.

II. There are more than one train to Mumbai.

III. There will be vacancy in the desired class.

(A) Only assumption I is implicit

(B) Only assumption II is implicit

(C) Only assumption I and II are implicit

(D) Only assumption II and III are implicit

Correct Answer: (A) Only assumption I is implicit

Solution: Assumption I is implicit because the statement mentions that Sangita is making the reservation in October for a journey in December, which indicates that the railway system allows reservations two months in advance.

Assumption II and III are not necessarily implied by the statement. The statement does not provide information about the number of trains to Mumbai or the availability of vacancies in the desired class.

Quick Tip

Check the advance reservation policies of the railway system before making travel plans to ensure availability within the booking period.

---

154. Given below is a set of statements. Examine the statements and state the nature of the relationship between them:

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

Correct Answer: (D) Both the statements I and II are effects of independent causes

Solution: The closure of schools (Statement I) and parents withdrawing their children from the local schools (Statement II) may not be directly related. Both could be effects of different independent causes, such as external factors affecting the schools or parents' decision-making process.

Quick Tip

When determining the relationship between statements, check if each is a result of different independent circumstances or if they are related to each other.

155. Given below is a set of statements. Examine the statements and state the nature of the relationship between them:

I. There has been a high increase in the incidents of atrocities against women in the city during the past few months.

II. The police authority has been unable to nab the culprits who are committing crimes against women.

(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

Correct Answer: (C) Both the statements I and II are independent causes

Solution: Statement I refers to the increase in atrocities, which could be the result of various factors, but it doesn't directly cause Statement II.

Statement II refers to the police's inability to catch the culprits, which could be caused by various factors like lack of resources or effective strategy, but is not directly caused by the increase in crimes.

Both events are independent causes and not directly linked to each other.

Quick Tip

Consider each statement in isolation and see if they are logically related or independently occurring events.

---

156. Given below is a set of statements. Examine the statements and state the nature of the relationship between them:

I. It is the aim of the municipal council authority to get the air pollution reduced by 20% in the next two months.

II. The number of respiratory diseases cases in the city are 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 some common cause

Correct Answer: (B) Statement II is the cause and statement I is its effect

Solution: - Statement II refers to the increasing cases of respiratory diseases, which can be caused by air pollution. - Statement I, which discusses the municipal council's aim to reduce air pollution, can be seen as an effort to address the rising health issues (respiratory diseases), making Statement II the cause and Statement I its effect.

Quick Tip

Look at the flow of causality between the statements. In this case, health problems due to pollution lead to actions aimed at reducing pollution.

---

157. Given below is a set of statements. Examine the statements and state the nature of the relationship between them:

I. There is considerable reduction in the number of people affected by water-borne diseases in rural areas during this rainy season.

II. The government has opened numbers of new civil hospitals in rural areas in the beginning of the year.

(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

Correct Answer: (C) Both the statements I and II are independent causes

Solution: Statement I refers to the reduction in water-borne diseases, which could be influenced by multiple factors, such as better sanitation, improved public health measures, or seasonal variations.

Statement II refers to the government's action of opening new hospitals, which could be aimed at improving healthcare infrastructure but is not necessarily related to the reduction in diseases mentioned in Statement I.

Since both statements appear to be independent actions, they are considered independent

causes.

Quick Tip

When analyzing cause-effect relationships, ensure that the two events are not directly linked but could be separate actions occurring independently.

---

158. Given below is a set of statements. Examine the statements and state the nature of the relationship between them:

I. The police authority has recently caught a group of house breakers.

II. The citizens group in the locality has 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 some common cause

Correct Answer: (D) Both the statements I and II are effects of some common cause

Solution: Statement I refers to the police catching house breakers, and Statement II refers to the citizens' action of starting a night vigil.

Both actions are likely the result of a common concern for safety or increasing crime in the locality. The rise in crime or insecurity might be the underlying cause of both actions.

Therefore, both statements are effects of the same common cause.

Quick Tip

When two actions appear to be responses to a shared issue, they may both be effects of a common cause.

---

159. Find the missing term: B2CD, _____ BCD4, B5CD, BC6D

(A) B2C2D

(B) BC3D

(C) B2C3D

(D) BC4D

Correct Answer: (B) BC3D

Solution: The pattern in the sequence involves the numbers 2, 3, 4, 5, and 6 in the second and fourth positions, while the first and third positions (B and D) remain fixed. The missing term must logically continue the pattern, with 3 in the second position and C in the third. Thus, the missing term is BC3D.

Quick Tip

When identifying missing terms in sequences, look for consistent patterns in both the numeric and letter positions.

---

160. Find the missing term in the sequence: QAR, RAS, SAT, TAU, _____

(A) TAS

(B) UAT

(C) UAV

(D) VAU

Correct Answer: (C) UAV

Solution: Looking at the pattern:

The first letter progresses alphabetically: Q, R, S, T, U (next in sequence is U).

The second letter progresses alphabetically: A, A, A, A, A (remains constant).

The third letter progresses alphabetically: R, S, T, U, V (next in sequence is V).

Thus, the missing term is UAV.

Quick Tip

Check for patterns in each position (first, second, and third letters) and identify the next logical sequence.

---

161. A bag contains 4 white, 5 red, and 6 blue balls. Three balls are drawn at random from the bag. The probability that all of them are red is:

(A) $\frac{2}{91}$

(B) $\frac{3}{22}$

(C) $\frac{5}{71}$

(D) $\frac{7}{51}$

Correct Answer: (A) $\frac{2}{91}$

Solution: Total number of balls = 4 (white) + 5 (red) + 6 (blue) = 15 balls.

The number of ways to choose 3 balls from 15 = $\binom{15}{3} = \frac{15\times14\times13}{3\times2\times1} = 455$.

The number of ways to choose 3 red balls from 5 = $\binom{5}{3} = \frac{5\times4\times3}{3\times2\times1} = 10$.

The probability of drawing 3 red balls = $\frac{\binom{5}{3}}{\binom{15}{3}} = \frac{10}{455} = \frac{2}{91}$.

Quick Tip

When calculating probability, use combinations to find the total possible outcomes and favorable outcomes.

---

162. If South-East becomes North, North-East becomes West and so on. What will West become?

(A) North-West

(B) South-West

(C) North-East

(D) South-East

Correct Answer: (D) South-East

Solution: In this case, the directions are being rotated. South-East becomes North, North-East becomes West, and so on. Following this pattern, West will rotate to South-East.

Quick Tip

When directions are rotated, observe the pattern and identify how each direction changes to deduce the correct result.

---

163. Village Q is to the North of the village P. The village R is in the East of Village Q. The village S is to the left of the village P. In which direction is the village S with respect

to village R?

(A) West

(B) South

(C) South-West

(D) North-West

Correct Answer: (C) South-West

Solution: Village Q is North of P, and R is East of Q.

S is to the left of P, which places S to the West of P.

Considering the relative position, S would be in the South-West direction relative to R.

Quick Tip

When directions are involved in a problem, use a visual representation or draw a diagram to better understand the relative positions.

---

164. Find the missing term: 8 : 28 :: 27 : ?

(A) 65

(B) 50

(C) 64

(D) 74

Correct Answer: (A) 65

Solution: - The pattern in the first pair $8 : 28$ can be observed as $8^2 + 4 = 28$. - Using the same pattern for the second pair, $27^2 + 4 = 729 + 4 = 65$.

Thus, the missing term is 65.

Quick Tip

Look for patterns involving powers and simple arithmetic operations to solve such ratio problems.

---

165. Find the missing term: BEGK : ADFJ :: PSVY : ?

(A) OQT

(B) ROUY

(C) ORUX

(D) LSUF

Correct Answer: (C) ORUX

Solution: - In the first pair $BEGK : ADFJ$, notice the following letter shifts:

- B -> A (shift back by 1)

- E -> D (shift back by 1)

- G -> F (shift back by 1)

- K -> J (shift back by 1)

Applying the same shift to $PSVY$:

- P -> O (shift back by 1)

- S -> R (shift back by 1)

- V -> U (shift back by 1)

- Y -> X (shift back by 1)

Thus, the missing term is ORUX.

Quick Tip

Check for consistent shifts in letters when comparing two pairs of words. The pattern of shifts will help determine the correct missing term.

---

166. A, B, C, D, and E play a game of cards. A says to B, "If you give me three cards, you will have as many as E has and if I give you three cards, you will have as many as D has." A and B together have 10 cards more than what D and E together have. If B has two cards more than what C has and the total number of cards be 133, how many cards does B have?

(A) 35

(B) 26

(C) 33

(D) 25

Correct Answer: (D) 25

Solution: 1. **Define Variables:** - Let A, B, C, D, E represent the number of cards each person has.

2. **Translate the Statements into Equations:**

- **Statement 1:** "If you give me three cards, you will have as many as E has."

$$B - 3 = E \quad (1)$$

- **Statement 2:** "If I give you three cards, you will have as many as D has."

$$B + 3 = D \quad (2)$$

- **Statement 3:** "A and B together have 10 cards more than what D and E together have."

$$A + B = D + E + 10 \quad (3)$$

- **Statement 4:** "B has two cards more than what C has."

$$B = C + 2 \quad (4)$$

- **Statement 5:** "The total number of cards is 133."

$$A + B + C + D + E = 133 \quad (5)$$

3. **Express All Variables in Terms of B:**

- From (1): $E = B - 3$.

- From (2): $D = B + 3$.

- From (4): $C = B - 2$.

- Substitute D, E, C into (3):

$$A + B = (B + 3) + (B - 3) + 10$$

Simplify:

$$A + B = 2B + 10$$

Solve for A:

$$A = B + 10$$

4. **Substitute All Variables into (5):**

- Substitute $A = B + 10$, $C = B - 2$, $D = B + 3$, and $E = B - 3$ into (5):

$$(B + 10) + B + (B - 2) + (B + 3) + (B - 3) = 133$$

Simplify:

$$5B + 8 = 133$$

Solve for B:

$$5B = 125$$

$$B = 25$$

Final Answer: The number of cards D has is $\boxed{25}$.

Quick Tip

Use a system of linear equations to solve problems involving relationships between quantities, and substitute known values to find the unknowns.

---

167. A certain number of horses and an equal number of men are going somewhere. Half of the owners are on their horses' back while the remaining ones are walking along leading their horses. If the number of legs walking on the ground is 70, how many horses are there?

(A) 14

(B) 16

(C) 18

(D) 20

Correct Answer: (A) 14

Solution: 1. **Define Variables:**

Let h be the number of horses.

Since the number of men is equal to the number of horses, the number of men is also h.

2. **Understand the Scenario:**

Half of the owners (men) are riding their horses, and the other half are walking and leading their horses.

Riding owners: $\frac{h}{2}$ men are on their horses. These men are not walking, so their legs are not on the ground.

Walking owners: $\frac{h}{2}$ men are walking and leading their horses. Each walking man has 2 legs on the ground.

Horses: Each horse has 4 legs. All horses are walking, so their legs are on the ground.

3. **Calculate the Total Number of Legs on the Ground:**

Legs from walking men:

$$\text{Legs from walking men} = \frac{h}{2} \times 2 = h$$

Legs from horses:

$$\text{Legs from horses} = h \times 4 = 4h$$

Total legs on the ground:

$$\text{Total legs} = \text{Legs from walking men} + \text{Legs from horses} = h + 4h = 5h$$

4. **Set Up the Equation:**

The total number of legs on the ground is given as 70:

$$5h = 70$$

5. **Solve for h:**

$$h = \frac{70}{5} = 14$$

Final Answer: The number of horses is $\boxed{14}$.

Quick Tip

In problems involving legs and animals, break down the total legs by separating the legs of the people and animals, and use equations to solve.

Question 168-172 are based on the criteria for selecting team leader for the V-Sphere Software Company.

168. Ram has scored 92% in the interview and he is fluent in English. He has six years of work experience as an Associate Engineer and knows Hindi. He was born on 30th March 1984.

Decide:

(A) if the candidate is to be rejected.

(B) if the candidate may be selected.

(C) if data is inadequate to take any decision.

(D) if the candidate is to be referred to the Manager.

Correct Answer: (B) if the candidate may be selected.

Solution: Ram has scored 92% in the interview, which is a strong performance.

He is fluent in English and knows Hindi, both of which could be valuable language skills depending on the job requirements.

He has six years of work experience as an Associate Engineer, which shows his competency in the field.

Based on this information, he seems to meet the qualifications for the role, so the decision would be to consider selecting him.

Quick Tip

When evaluating candidates, consider their qualifications, experience, and language skills to assess their suitability for the role.

---

169. Ashalata was born in 1983 and she knows both Telugu and Hindi. She has three years of work experience as an Associate Engineer. She scored 90% in the interview and speaks English fluently. She also has six years of work experience as a Testing Engineer.

Decide:

(A) if the candidate is to be rejected.

(B) if the candidate may be selected.

(C) if data is inadequate to take any decision.

(D) if the candidate is to be referred to the Manager.

Correct Answer: (B) if the candidate may be selected.

Solution: Ashalata has scored 90% in the interview, which is a solid performance.
She speaks both Telugu and Hindi, which is beneficial depending on the language requirements of the position.
She has three years of experience as an Associate Engineer and six years as a Testing Engineer, which shows a broad skill set.
Additionally, her fluency in English adds value to her profile.
Based on these qualifications, the candidate may be selected for the role.

Quick Tip

Evaluate candidates based on their skills, experience, and interview performance. A strong profile like this one makes her a strong contender for selection.

---

170. Yogini scored 90% in the interview and is fluent in English. She knows Telugu and is 34 years old. She has ten years of work experience as a Software Engineer and has six years of work experience as a Testing Engineer.
Decide:
(A) if the candidate is to be rejected.
(B) if the candidate may be selected.
(C) if data is inadequate to take any decision.
(D) if the candidate is to be referred to the Manager.
Correct Answer: (C) if data is inadequate to take any decision.
Solution: Yogini has scored 90% in the interview, which is a strong performance.
She is fluent in English and knows Telugu, which can be useful depending on the job's language requirements.
She has ten years of work experience as a Software Engineer and six years as a Testing Engineer, showing her experience in the field.
However, there is not enough information provided about the specific job requirements or additional qualifications to definitively decide whether she should be selected or rejected.
Therefore, the data is inadequate to take a final decision.

Quick Tip

When making a decision, consider all the specific criteria required for the role. If important information is missing, it can lead to an indecisive conclusion.

---

171. Pramod was born on 10th September 1988. He has six years of work experience as an Associate Engineer, and is fluent in English. He knows both Hindi and English and scored 85% in the interview. He has nine years work experience as a Software Engineer. Decide:

(A) if the candidate is to be rejected.

(B) if the candidate may be selected.

(C) if data is inadequate to take any decision.

(D) if the candidate is to be referred to the Manager.

Correct Answer: (A) if the candidate is to be rejected.

Solution: Based on the details provided, Pramod has:

- Six years of experience as an Associate Engineer.
- Nine years of experience as a Software Engineer.
- Proficiency in both Hindi and English.
- A strong interview score of 85%.

However, given that the information does not specify specific requirements for selection, such as educational qualifications or other specific skills required for the role, it is possible that the data provided does not meet the criteria needed to make a final decision on selection. Therefore, the most appropriate action would be to reject the candidate.

Thus, the correct answer is:

Candidate is to be rejected.

Quick Tip

When evaluating candidates, ensure that all qualifications align with the specific job requirements. If key skills or experience are lacking, rejection may be necessary.

---

172. Varsha has nine years of work experience as a Software Engineer and knows Telugu. She is fluent in English and has five years of work experience as an Associate Engineer and scored 97% in the interview. Her age is 41 years.

Decide:

(A) if the candidate is to be rejected.

(B) if the candidate may be selected.

(C) if data is inadequate to take any decision.

(D) if the candidate is to be referred to the Manager.

Correct Answer: (D) if the candidate is to be referred to the Manager.

Solution: Varsha has scored 97% in the interview, which is an excellent score, and she is fluent in English and knows Telugu, which are valuable language skills.

She has nine years of experience as a Software Engineer and five years of experience as an Associate Engineer, demonstrating a broad skill set.

While her qualifications are strong, her age (41 years) might be a consideration in certain contexts, depending on the company's policies and requirements.

Given the available information, the decision is to refer her to the Manager for further review, as the age factor may need further consideration.

Quick Tip

When evaluating candidates, consider all aspects, including qualifications, experience, and company policies. In cases where age might be a concern, it's a good idea to refer the candidate to higher authorities for further evaluation.

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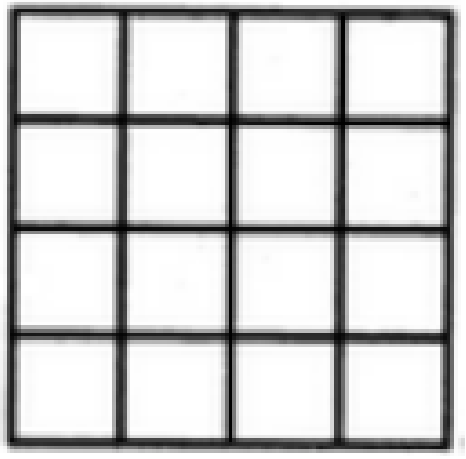
173. Count the number of squares in the given figure.



(A) 32

(B) 30

(C) 29

(D) 28

Correct Answer: (B) 30

Solution: The figure consists of a 4x4 grid, where we need to count the number of squares of various sizes.

First, we count the 1×1 squares. There are $4 \times 4 = 16$ such squares.

Next, count the 2×2 squares. These squares can fit in a 3×3 grid, so there are $3 \times 3 = 9$ such squares.

Then, count the 3×3 squares. These squares can fit in a 2×2 grid, so there are $2 \times 2 = 4$ such squares.

Finally, there is 1 square of size 4×4 (the entire grid).

Thus, the total number of squares is:

$$16\,(1 \times 1) + 9\,(2 \times 2) + 4\,(3 \times 3) + 1\,(4 \times 4) = 30.$$

Quick Tip

When counting squares in a grid, remember to count squares of all sizes, including smaller ones and the larger squares formed by combining multiple smaller squares.

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174. 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

Correct Answer: (D) pixnarth

Solution: "gorblflur" means "fan belt," so "gorbl" means fan and "flur" means belt.

"pixngorbl" means "ceiling fan," so "pixn" means ceiling and "gorbl" means fan.

"arthtusl" means "tile roof," so "arth" means tile and "tusl" means roof.

To form the word for "ceiling tile," we combine "pixn" (ceiling) from "pixngorbl" and "arth" (tile) from "arthtusl."

Thus, the word for "ceiling tile" is pixnarth.

Quick Tip

In problems involving artificial languages, break down the words into smaller components and match them based on their meanings.

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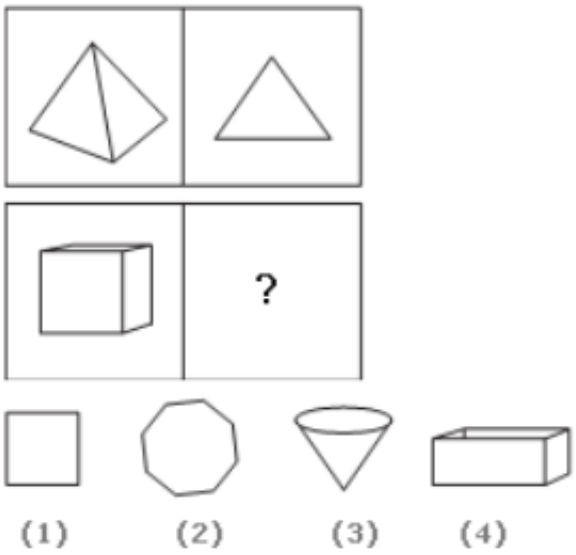
175. Choose the picture that would go in the empty box so that the two bottom pictures are related in the same way as the top two are related.



(A) 1

(B) 2

(C) 3

(D) 4

Correct Answer: (A) 1

Solution: In the top row, we have a 3D object (a pyramid) and its 2D counterpart (a triangle). In the bottom row, we have a 3D object (a cube), and we need to find its 2D counterpart. The 2D counterpart of a cube is a square, which corresponds to option (1). Thus, the picture for the empty box is option (1).

Quick Tip

When comparing 3D and 2D shapes, identify the corresponding 2D figure that represents the 3D object. For example, a cube corresponds to a square.

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176. Violating an Apartment Lease occurs when a tenant does something banned 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) Priyanka 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) Sharad recently lost her job and, for the last three months, has neglected to pay his landlord the monthly rent they agreed upon in writing when he moved into her apartment eight months ago.
(C) Uday writes a letter to his landlord that lists numerous complaints about the apartment he has agreed to rent for two years.
(D) Anna thinks that her landlord is neglecting the building in which she rents an apartment. He calls her attorney to ask for advice.
Correct Answer: (B) Sharad recently lost her job and, for the last three months, has neglected to pay his landlord the monthly rent they agreed upon in writing when he moved into her apartment eight months ago.
Solution: Option (A) involves Priyanka notifying the landlord about not renewing the lease, which is not a violation of the lease agreement.
Option (B) describes Sharad failing to pay rent as agreed in the lease, which is a clear violation of the lease terms. This is the correct example.
Option (C) describes Uday listing complaints about the apartment, which does not violate the lease.
Option (D) involves Anna seeking legal advice but does not indicate a violation of the lease agreement.
Thus, the best example of violating an apartment lease is (B).

Quick Tip

To identify lease violations, focus on the terms outlined in the lease agreement, particularly financial obligations such as rent payments and prohibited activities.

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177. From a group of 7 men and 6 women, five persons are to be selected to form a committee so that at least 3 men are there on the committee. In how many ways can it be done?
(A) 564
(B) 546
(C) 746

(D) 756

Correct Answer: (D) 756

Solution: We need to select 5 persons with at least 3 men. We can do this in the following ways:

1. Select 3 men and 2 women:

Number of ways to select 3 men from 7: $\binom{7}{3} = \frac{7\times6\times5}{3\times2\times1} = 35$

Number of ways to select 2 women from 6: $\binom{6}{2} = \frac{6\times5}{2\times1} = 15$

Total ways for this case: $35 \times 15 = 525$

2. Select 4 men and 1 woman:

Number of ways to select 4 men from 7: $\binom{7}{4} = \frac{7\times6\times5\times4}{4\times3\times2\times1} = 35$

Number of ways to select 1 woman from 6: $\binom{6}{1} = 6$

Total ways for this case: $35 \times 6 = 210$

3. Select 5 men:

Number of ways to select 5 men from 7: $\binom{7}{5} = \frac{7\times6}{2\times1} = 21$

Total ways for this case: 21

Thus, the total number of ways is:

$$525 + 210 + 21 = 756$$

Thus, the total number of ways to form the committee is 756.

Quick Tip

When selecting persons with specific conditions, break the problem into cases and calculate each case separately, then add the results together.

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178. The difference between a two-digit number and the number obtained by interchanging the digits is 36. What is the difference between the sum and the difference of the digits of the number if the ratio between the digits of the number is 1 : 2?

(A) 4

(B) 6

(C) 8

(D) 10

Correct Answer: (C) 8

Solution: 1. **Define Variables:**

Let the two-digit number be $10x + y$, where:

x is the tens digit.

y is the units digit.

The ratio between the digits is $1 : 2$, so:

$$\frac{x}{y} = \frac{1}{2} \quad \Rightarrow \quad y = 2x$$

2. **Number Obtained by Interchanging the Digits:**

The number obtained by interchanging the digits is $10y + x$.

3. **Difference Between the Two Numbers:**

The difference between the original number and the interchanged number is 36:

$$(10x + y) - (10y + x) = 36$$

Simplify:

$$10x + y - 10y - x = 36$$

$$9x - 9y = 36$$

Divide through by 9:

$$x - y = 4 \quad (1)$$

4. **Substitute $y = 2x$ into Equation (1):**

$$x - 2x = 4$$

$$-x = 4$$

$$x = -4$$

This result is not valid because digits cannot be negative. Let's re-examine the problem.

5. **Re-evaluate the Difference:**

The absolute difference between the two numbers is 36:

$$|(10x + y) - (10y + x)| = 36$$

Simplify:

$$|9x - 9y| = 36$$

$$|x - y| = 4 \quad (2)$$

6. **Use the Ratio $y = 2x$:**

Substitute $y = 2x$ into Equation (2):

$$|x - 2x| = 4$$

$$|-x| = 4$$

$$x = 4$$

Since x is a digit, $x = 4$. Then:

$$y = 2x = 8$$

7. **Calculate the Sum and Difference of the Digits:**

Sum of the digits:

$$x + y = 4 + 8 = 12$$

Difference of the digits:

$$y - x = 8 - 4 = 4$$

8. **Find the Difference Between the Sum and the Difference:**

$$(x + y) - (y - x) = 12 - 4 = 8$$

Final Answer: The difference between the sum and the difference of the digits is $\boxed{8}$.

Quick Tip

In problems involving ratios and digit manipulation, start by expressing relationships between the digits algebraically and use the given conditions to form equations.

179. The largest 4 digit number exactly divisible by 88 is:

(A) 8888

(B) 9944

(C) 9964

(D) 9988

Correct Answer: (B) 9944

Solution: To find the largest 4-digit number divisible by 88, we first divide the largest 4-digit number, 9999, by 88:

$$9999 \div 88 = 113.625$$

Taking the integer part of the quotient, we get 113. Now, multiply 113 by 88 to get the largest multiple of 88 that is less than or equal to 9999:

$$88 \times 113 = 9944$$

Thus, the largest 4-digit number divisible by 88 is 9944.

Quick Tip

To find the largest multiple of a number within a given range, divide the largest number by the divisor, round down the quotient, and multiply it back by the divisor.

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180. Which one of the following is always associated with 'tree'?

(A) Roots

(B) Fruits

(C) Leaves

(D) Flowers

Correct Answer: (A) Roots

Solution:

Roots are always associated with trees because they are an essential part of the tree's structure, allowing it to anchor in the ground and absorb nutrients and water.

Fruits, leaves, and flowers may not always be present in every tree, as some trees may not produce fruits or flowers, and some may shed their leaves in winter.
Thus, the correct answer is (A) Roots.

Quick Tip

Roots are an essential part of every tree, whereas other components like fruits, leaves, or flowers may not be present in all trees.
