IBSAT 2017 Model Paper - 2 Question Paper with Solutions

Time Allowed :3 Hours	**Maximum Marks :**100	**Total Questions :** 140

General Instructions

Read the following instructions very carefully and strictly follow them:

1. The test paper contains 140 Multiple Choice Questions (MCQs) for a total of 140 marks.
2. **There will be Negative Marking for Multiple Choice Questions (MCQs).** For every wrong answer 0.25 marks will be deducted.
3. Candidates have to indicate the most appropriate answer by darkening one of the four responses provided, with only **BLACK/BLUE BALL POINT PEN** in the OMR Response Sheet.
   Example: For the question, "Where is the Taj Mahal located?"
   a) Kolkata b) Agra c) Bhopal d) Delhi

   Right Method

   a • c d

   Wrong Methods

   a ⊗ c d a ✓ c d a ◯ c d
4. Answering the question by any method other than the method mentioned above shall be considered wrong answer.
5. More than one response to a question shall be counted as wrong answer.
6. The candidate shall not write anything on the OMR Response Sheet other than the details required and, in the spaces, provided for.
7. After the examination is over, the candidate can carry the Question Booklet along with candidate's copy of the OMR Response Sheet. Candidate will hand over the original OMR Response Sheet to the invigilator.
8. Electronic gadgets like mobile phones, digital watch, pagers and calculators etc. are strictly not permitted inside the Test Centre/Hall.

Section I
Verbal Ability

Directions: In the following questions, each word is followed by five options. Choose the option which is the closest synonym of the given words. While choosing your answer, keep in mind the finer distinctions in the meaning and usage of certain words.

1. FURTIVE

(A) Spicy
(B) Secretive
(C) Palpable
(D) Fruitful
(E) Alien

Correct Answer: (B) Secretive

Solution:

Step 1: Understanding the meaning of "Furtive."
The word "furtive" means something done in a secret, stealthy, or hidden manner — often to avoid notice or attention. It refers to actions that are sneaky or clandestine.

Step 2: Analyzing the options.
(A) Spicy: Unrelated in meaning.
(B) Secretive: Correct. A secretive person or action conceals motives or feelings — exactly matching "furtive."
(C) Palpable: Means something easily noticeable or tangible — opposite in sense.
(D) Fruitful: Means productive — unrelated.
(E) Alien: Means foreign or strange — unrelated.

Step 3: Conclusion.
The synonym closest to "furtive" is **(B) Secretive**.

Quick Tip

"Furtive glances" means secret or sly looks, often implying hidden motives.

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2. INSIDIOUS

(A) Tasteless
(B) Treacherous
(C) Secure
(D) Formal
(E) Vigilant

Correct Answer: (B) Treacherous

Solution:

Step 1: Understanding the meaning of "Insidious."
The word "insidious" refers to something harmful that proceeds subtly, stealthily, or treacherously. It describes a danger or deceit that spreads gradually without being noticed.

Step 2: Analyzing the options.
(A) Tasteless: Refers to flavor, not meaning-related.
(B) Treacherous: Correct. "Treacherous" means deceitful or dangerous in a hidden way, matching the meaning of "insidious."
(C) Secure: Opposite in meaning — safe, not dangerous.
(D) Formal: Relates to manners or procedure — irrelevant.
(E) Vigilant: Means watchful or alert — not a synonym.

Step 3: Conclusion.
The synonym closest to "insidious" is **(B) Treacherous**.

Quick Tip

"Insidious" dangers often appear harmless at first but cause great harm later — for example, an insidious disease or scheme.

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3. APLOMB

(A) Poise
(B) Solitude
(C) Panacea
(D) Alertness
(E) Greed

Correct Answer: (A) Poise

Solution:

Step 1: Meaning check.
"Aplomb" means self-confidence or composure, especially in difficult situations.

Step 2: Option analysis.
(A) Poise — Correct; means confident composure.
(B) Solitude — Aloneness; unrelated.
(C) Panacea — Cure-all; unrelated.
(D) Alertness — Watchfulness; not same as composure.
(E) Greed — Avarice; unrelated.

Step 3: Conclusion.
The closest synonym is **Poise**.

Quick Tip

Remember: "aplomb under pressure" = calm self-confidence.

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4. WOE

(A) Homage
(B) Evidence
(C) Chaos
(D) Deluge
(E) Sorrow

Correct Answer: (E) Sorrow

Solution:

Step 1: Meaning check.
"Woe" means deep distress, misery, or *sorrow*.

Step 2: Option analysis.
(E) Sorrow — Correct; direct synonym.
Other options denote respect (Homage), proof (Evidence), disorder (Chaos), or flood (Deluge) — all unrelated.

Step 3: Conclusion.
The closest synonym is **Sorrow**.

Quick Tip

Phrase cue: "woes and worries" = troubles and sorrows.

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5. EMULATE

(A) Appear
(B) Impose
(C) Imitate
(D) Operate
(E) Collect

Correct Answer: (C) Imitate

Solution:

Step 1: Meaning check.
"To emulate" means to match or surpass by *imitating* or following as a model.

Step 2: Option analysis.
(C) Imitate — Correct; closest in meaning.
(A) Appear, **(B)** Impose, **(D)** Operate, **(E)** Collect — not related.

Step 3: Conclusion.
The closest synonym is **Imitate**.

Quick Tip

"Emulate a role model" = try to equal them by imitating their actions.

Directions: In the following questions, each word is followed by five options. Choose the option which is the closest antonym of the given words. While choosing your answer, keep in mind the finer distinctions in the meaning and usage of certain words.

6. FABRICATE

(A) Aggravate
(B) Establish
(C) Destroy

(D) Foster
(E) Electrify

Correct Answer: (C) Destroy

Solution:
Step 1: Meaning of 'Fabricate'.
The word 'fabricate' means to make, construct, or invent something, often with skill or deceit. For example, "He fabricated the story" means "He made up the story."

Step 2: Find the antonym.
The opposite of "to make or build" is "to break down or destroy." Hence, the antonym of "fabricate" is "destroy."

Step 3: Analyze options.
(A) Aggravate – means to make worse. (Not opposite)
(B) Establish – means to set up, similar to fabricate.
(C) Destroy – opposite of fabricate. (Correct)
(D) Foster – means to encourage. (Not opposite)
(E) Electrify – means to excite. (Not opposite)

Step 4: Conclusion.
Thus, the antonym of "fabricate" is **destroy**.

Quick Tip

When finding antonyms, think of the root meaning. 'Fabricate' (to make) → opposite is 'destroy' (to unmake).

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7. HEED

(A) Hope
(B) Ignore
(C) Overtake
(D) Nurture
(E) Pacify

Correct Answer: (B) Ignore

Solution:
Step 1: Meaning of 'Heed'.

'Heed' means to pay careful attention to something. For example, "You should heed the warning."

Step 2: Find the antonym.
The opposite of "to pay attention" is "to ignore."

Step 3: Analyze options.
(A) Hope – unrelated.
(B) Ignore – opposite meaning. (Correct)
(C) Overtake – unrelated.
(D) Nurture – means to care for; not opposite.
(E) Pacify – means to calm down; not opposite.

Step 4: Conclusion.
Hence, the antonym of "heed" is **ignore**.

Quick Tip

'Heed' means 'to listen or pay attention'; the direct opposite is 'ignore.'

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8. APPROBATION

(A) Disguise
(B) Corruption
(C) Treachery
(D) Permanent
(E) Disapproval

Correct Answer: (E) Disapproval

Solution:
Step 1: Meaning.
Approbation means approval or praise.
Step 2: Opposite.
The closest antonym is *disapproval*. Other options do not oppose "approval."

Quick Tip

Think "approve → approbation"; the antonym is "disapprove → disapproval."

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9. MIRTH

(A) Serenity
(B) Triumph
(C) Gloom
(D) Newness
(E) Gaiety

Correct Answer: (C) Gloom

Solution:
Step 1: Meaning.
Mirth = laughter, joy, merriment.
Step 2: Opposite.
The antonym is *gloom* (sadness).

Quick Tip

Match tone: mirth(joy) gloom(sadness); gaiety is actually a synonym, not an antonym.

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10. CELESTIAL

(A) Sacred
(B) Hazardous
(C) Unhealthy
(D) Earthly
(E) Glorious

Correct Answer: (D) Earthly

Solution:
Step 1: Meaning.
Celestial means relating to the sky or heavens.
Step 2: Opposite.
The opposite is *earthly* (terrestrial, of the earth).

Quick Tip

Celestial (heaven/sky) Earthly (land/ground).

Directions: In the following questions, the first two words are related in a particular manner. You have to choose a word from the options so that a new pair of words is formed where the relation is the same as that of the first pair of words. You are required to consider the secondary meaning of certain words while choosing an answer.

11. Pack : Wolves :: Shoal :

(A) Locusts
(B) Fish
(C) Chicken
(D) Books
(E) Passengers

Correct Answer: (B) Fish

Solution:

Step 1: Identify the relation in the first pair.
"Pack : Wolves" — *Pack* is a collective noun for a group of *wolves*.

Step 2: Apply the same relation to the second pair.
A *shoal* is a collective noun for a group of *fish*.

Step 3: Eliminate incorrect options.
Locusts (swarm), Chicken (flock), Books (stack), Passengers (crowd) — do not match "shoal."

Step 4: Conclusion.
Thus, **Shoal : Fish**.

Quick Tip

Collective nouns: pack (wolves), pride (lions), shoal/school (fish), flock (birds/sheep), swarm (bees/locusts).

12. Unbiased : Judge :: Articulate :

(A) Orator
(B) Soldier
(C) Celebrity

(D) Clown
(E) Novice

Correct Answer: (A) Orator

Solution:

Step 1: Identify the trait–profession relation.
A good *judge* is expected to be *unbiased*.

Step 2: Map the same relation.
An *orator* (public speaker) is expected to be *articulate*.

Step 3: Eliminate distractors.
Soldier, celebrity, clown, novice — "articulate" is not the defining/expected trait for these roles.

Step 4: Conclusion.
Therefore, **Articulate : Orator**.

Quick Tip

In analogy questions, check if the first word is a *quality/defining trait* of the second; then find the option where that trait matches the role.

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13. Classify : Taxonomist :: Bargain :

(A) Sojourner
(B) Minstrel
(C) Juggler
(D) Visitor
(E) Haggler

Correct Answer: (E) Haggler

Solution:

Step 1: Identify the relation.
A *taxonomist* is one who *classifies*.

Step 2: Apply to second pair.
One who *bargains* is a *haggler*.

Step 3: Conclusion.
Therefore, **Bargain : Haggler**.

Quick Tip

Look for "action : doer" pairs (e.g., heal : doctor, bargain : haggler).

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14. Vindicator : Revenge :: Epicurean :

(A) Sorrow
(B) Fright
(C) Hesitation
(D) Pleasure
(E) Depression

Correct Answer: (D) Pleasure

Solution:

Step 1: Identify the relation.
A *vindicator* seeks or is associated with *revenge*.

Step 2: Map the same relation.
An *epicurean* seeks or is devoted to *pleasure*.

Step 3: Conclusion.
Thus, **Epicurean : Pleasure**.

Quick Tip

Match "person-type : chief pursuit/trait" — stoic : endurance, epicurean : pleasure.

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15. Hammer : Nail :: Scissors :

(A) Screw
(B) Pearl

(C) Paper
(D) Shape
(E) Design

Correct Answer: (C) Paper

Solution:

Step 1: Identify the tool–object relation.
A *hammer* is a tool used on a *nail*.

Step 2: Apply it to scissors.
Scissors are a tool used to cut *paper*.

Step 3: Conclusion.
Therefore, **Scissors : Paper**.

Quick Tip

For tool analogies, pair each tool with its most typical object: hammer–nail, scissors–paper, saw–wood.

IV. Directions: Fill in the blanks with the words that best fit the meaning of the sentence as a whole.

16. Indian policies should _____ on social justice and on inclusive growth and development, which in the long term will provide greater _____ for all its people.

(A) depend ... safety
(B) focus ... security
(C) count ... confidence
(D) direct ... protection
(E) build ... delight

Correct Answer: (B) focus ... security

Solution:
Step 1: Analyze the context.
The sentence talks about Indian policies emphasizing social justice and inclusive growth to ensure long-term welfare for people. Therefore, the verb should convey "giving attention to."

The noun should express "safety or assurance."

Step 2: Meaning analysis.
"Focus on social justice" fits naturally. "Security for all its people" conveys the desired long-term outcome.

Step 3: Evaluate other options.
(A) "Depend ... safety" – doesn't fit grammatically.
(C) "Count ... confidence" – awkward phrasing.
(D) "Direct ... protection" – incorrect structure.
(E) "Build ... delight" – illogical in policy context.

Step 4: Conclusion.
Thus, the correct pair is "**focus ... security**."

Quick Tip

When filling blanks, ensure the pair maintains logical sense and grammatical correctness in context.

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17. Research should be done on rainwater _____ and treatment of wastewater so that it might be recycled and made _____.

(A) harvesting ... potable
(B) preserving ... available
(C) controlling ... possible
(D) maintaining ... edible
(E) collecting ... accessible

Correct Answer: (A) harvesting ... potable

Solution:
Step 1: Understand the context.
The sentence concerns environmental research on water management and recycling, implying sustainable usage.

Step 2: Word fit.
"Rainwater harvesting" is a well-known phrase referring to collecting and storing rainwater. The goal of wastewater treatment is to make it "potable" (fit for drinking).

Step 3: Eliminate incorrect options.
(B) "Preserving ... available" – weak collocation.

(C) "Controlling ... possible" – illogical.
(D) "Maintaining ... edible" – "edible" is for food, not water.
(E) "Collecting ... accessible" – vague and incomplete meaning.

Step 4: Conclusion.
Therefore, the best pair is "**harvesting ... potable**."

Quick Tip

Use common collocations (e.g., "rainwater harvesting," "potable water") to identify correct contextual pairs.

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18. A team without a good and simple _____ system is like trying to _____ a car without a steering wheel.

(A) guiding ... move
(B) convincing ... push
(C) working ... drive
(D) developmental ... pull
(E) leading ... propel

Correct Answer: (C) working ... drive

Solution:

Step 1: Check natural collocations.
"Working system" is a common, idiomatic phrase meaning a system that functions well.

Step 2: Match the verb with "car."
We *drive* a car (not move/push/pull/propel in normal usage).

Step 3: Conclusion.
Thus, "good and simple **working** system" and "trying to **drive** a car" gives the most natural sentence.

Quick Tip

In fill-in-the-blank questions, prefer options that form standard collocations (e.g., "working system," "drive a car").

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19. The _____ cell phone is a wonderful invention of technology, making our lives _____ and happy.

(A) popular . . . blissful
(B) modern . . . stressful
(C) portable . . . pleasant
(D) ubiquitous . . . comfortable
(E) effective . . . joyful

Correct Answer: (D) ubiquitous . . . comfortable

Solution:

Step 1: Choose the adjective that logically describes cell phones today.
"Ubiquitous" means present everywhere — accurately describing cell phones.

Step 2: Pick a positive life-effect that fits the sentence.
"Comfortable and happy" is a natural pairing; "comfortable" collocates well with "life."

Step 3: Eliminate odd pairings.
"Popular . . . blissful" is awkward; "modern . . . stressful" contradicts the positive tone; "portable . . . pleasant" and "effective . . . joyful" are less idiomatic.

Step 4: Conclusion.
Therefore, **ubiquitous . . . comfortable** fits best.

Quick Tip

Look for words that both fit meaning and sound natural together (e.g., "ubiquitous cell phone," "comfortable life").

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20. As he _____ to the dais, the crowd went _____ trying to get a closer look of him.

(A) went . . . noisy
(B) walked . . . happy
(C) climbed . . . fearful
(D) strode . . . berserk
(E) moved . . . crazy

Correct Answer: (D) strode ... berserk

Solution:

Step 1: Understanding the context.
The sentence describes a confident person approaching a platform (dais) while the crowd reacts excitedly. The words must fit both the tone of the man's movement and the crowd's reaction.

Step 2: Analyze the options.
(A) went ... noisy: Grammatically awkward; "went noisy" is incorrect usage.
(B) walked ... happy: Too mild and fails to convey enthusiasm or intensity.
(C) climbed ... fearful: Climbing doesn't fit "to the dais," and "fearful" doesn't match the crowd's energy.
(D) strode ... berserk: Perfect fit. "Strode" suggests confidence and purpose; "berserk" implies wild excitement, matching the crowd's reaction.
(E) moved ... crazy: Informal and ungrammatical.

Step 3: Conclusion.
Thus, the correct and most appropriate completion is "strode ... berserk."

Quick Tip

When completing sentence fillers, match the tone and emotion of both clauses logically — here, confident movement aligns with an excited crowd.

V. Directions: In the following questions, each sentence is divided into four parts (a), (b), (c) and (d). Find out which part of the sentence contains an error. If there is no error, mark your answer as (e).

21. While the Indian Constitution guarantees / equality for women, / legal protection have little effect / in the face of prevailing culture. / No error

(a) While the Indian Constitution guarantees
(b) equality for women,
(c) legal protection have little effect
(d) in the face of prevailing culture.
(e) No error

Correct Answer: (C) legal protection have little effect

Solution:

Step 1: Identify the subject–verb agreement issue.
The subject "legal protection" is singular. Therefore, the verb should also be singular — "has," not "have."

Step 2: Correction.
Correct sentence: "While the Indian Constitution guarantees equality for women, legal protection **has** little effect in the face of prevailing culture."

Step 3: Conclusion.
The error lies in part **(C)**.

Quick Tip

For collective or uncountable nouns like "information," "education," or "protection," always use singular verbs.

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22. The detective says / that there is no chance / for finding the person / who wrote these letters. / No error

(a) The detective says
(b) that there is no chance
(c) for finding the person
(d) who wrote these letters.
(e) No error

Correct Answer: (C) for finding the person

Solution:

Step 1: Identify the preposition error.
The correct preposition after "chance" is "of," not "for," when referring to probability or possibility.

Step 2: Correction.
Correct sentence: "The detective says that there is no chance **of** finding the person who wrote these letters."

Step 3: Conclusion.
The error lies in part **(C)** due to incorrect preposition usage.

Quick Tip

Use "chance of" to express probability (e.g., "no chance of success"), and "chance for" to express opportunity (e.g., "a chance for promotion").

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23. He had scarcely / sat down / than there was a / knock at the door. / No error

(a) He had scarcely
(b) sat down
(c) than there was a
(d) knock at the door
(e) No error

Correct Answer: (C) than there was a

Solution:

Step 1: Grammar rule.
The conjunction "scarcely" is followed by "when" or "before," not "than."

Step 2: Correction.
The sentence should read: "He had scarcely sat down **when** there was a knock at the door."

Step 3: Conclusion.
The error lies in part **(C)**.

Quick Tip

Pairs: "Hardly...when," "Scarcely...when," "No sooner...than."

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24. The laboratory of Physics is / not only equipped with / state-of-the-art instruments / but also with outstanding Physicists. / No error

(a) The laboratory of Physics is
(b) not only equipped with
(c) state-of-the-art instruments
(d) but also with outstanding Physicists
(e) No error

Correct Answer: (B) not only equipped with

Solution:

Step 1: Grammar rule.
The correlative pair "not only...but also" should connect *similar grammatical structures*. Here, "equipped with" is a verb phrase, so "not only" must precede "is," not "equipped."

Step 2: Correction.
Correct form: "The laboratory of Physics **is not only** equipped with state-of-the-art instruments but also with outstanding Physicists."

Step 3: Conclusion.
The error lies in part **(B)** because "not only" is misplaced.

Quick Tip

In "not only...but also" pairs, place "not only" before the verb for correct parallel structure.

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25. Finishing his breakfast, / he started working / on the long / pending hours. / No error

(a) Finishing his breakfast
(b) he started working
(c) on the long
(d) pending hours
(e) No error

Correct Answer: (A) Finishing his breakfast

Solution:

Step 1: Grammar rule.
The participle "Finishing" is incorrect when referring to an action already completed before another action. The correct form should be the perfect participle "Having finished."

Step 2: Correction.
Correct sentence: "**Having finished** his breakfast, he started working on the long pending hours."

Step 3: Conclusion.
The error lies in part **(A)**.

Quick Tip

When one action is completed before another begins, use the perfect participle "Having + past participle."

Directions: In each of the following questions, a part of the given sentence has been underlined as this part may have an error. The first option is the same as the underlined part in the given sentence. Choose this option if you think that the underlined part has no error. Otherwise, choose the option that rectifies the error in the underlined part of the given sentence.

26. Practically, <u>any parts</u> of banana tree is useful to man.

(A) any parts
(B) most part
(C) every part
(D) all part
(E) each parts

Correct Answer: (C) every part

Solution:

Step 1: Identify the grammatical error.
The subject "banana tree" is singular, and the sentence refers to all of its parts collectively. Therefore, the correct usage should be singular, not plural.

Step 2: Analyze the options.
(A) any parts: Incorrect — "parts" (plural) is wrong when referring to the tree as a whole.
(B) most part: Incorrect — "part" singular doesn't agree with the idea of many useful portions.
(C) every part: Correct — "every" agrees with the singular noun "part" and conveys that each part of the banana tree is useful.
(D) all part: Incorrect — "all" requires plural ("all parts").
(E) each parts: Incorrect — "each" must be followed by a singular noun.

Step 3: Conclusion.
The correct phrase is "every part of banana tree," making the corrected sentence: *Practically,*

every part of banana tree is useful to man.

Quick Tip

Use "every" with singular nouns to indicate all individual members of a group collectively.

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27. More and more people are becoming dependent on its nuclear families to provide them whatever support they require.

(A) are becoming dependent on its
(B) are becoming dependent on their
(C) are become dependent on their
(D) have been becoming dependent on their
(E) are become dependent on its

Correct Answer: (B) are becoming dependent on their

Solution:

Step 1: Identify the pronoun agreement error.
The subject "people" is plural, but the pronoun used ("its") is singular. Therefore, the correct plural pronoun should be "their."

Step 2: Analyze the options.
(A) are becoming dependent on its: Incorrect — mismatch between plural subject "people" and singular pronoun "its."
(B) are becoming dependent on their: Correct — "their" agrees with plural "people."
(C) are become dependent on their: Incorrect — wrong tense structure.
(D) have been becoming dependent on their: Grammatically possible but unnecessarily complex.
(E) are become dependent on its: Incorrect — wrong tense and pronoun.

Step 3: Conclusion.
The correct sentence is: *More and more people are becoming dependent on their nuclear families to provide them whatever support they require.*

Quick Tip

Ensure pronouns agree in number and gender with the nouns they refer to — plural nouns need plural pronouns.

28. French planes are more superior than Italian planes.

(A) more superior than
(B) most superior than
(C) superior than
(D) superior to
(E) more than superior

Correct Answer: (D) superior to

Solution:

Step 1: Identify grammatical redundancy.
The word "superior" already implies comparison; therefore, adding "more" before it is redundant. The correct preposition that follows "superior" is "to," not "than."

Step 2: Correct the sentence.
The correct form is: "French planes are superior to Italian planes."

Step 3: Conclusion.
Thus, the grammatically correct option is **(D) superior to**.

Quick Tip

Avoid using "more" or "most" with adjectives that already express a comparative degree, such as superior, senior, junior, prior, or inferior.

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29. A handful of pebble in the bottoms of a flowerpot will help drainage.

(A) handful of pebble in the bottoms
(B) handfuls of pebbles at the bottom
(C) handful with pebbles in the bottom
(D) pebble of handful in the bottom
(E) handful of pebbles in the bottom

Correct Answer: (E) handful of pebbles in the bottom

Solution:

Step 1: Check subject–noun agreement.
The noun "pebble" should be plural because "a handful of" refers to multiple small items. Hence, "pebbles" is correct.

Step 2: Choose the proper preposition.
"The bottom" (singular) is used since the flowerpot has one bottom, not multiple "bottoms."

Step 3: Construct the correct sentence.
The correct sentence is: "A handful of pebbles in the bottom of a flowerpot will help drainage."

Step 4: Conclusion.
Thus, the correct option is **(E)**.

Quick Tip

Always ensure plural nouns follow collective quantity expressions like "a handful of," "a bunch of," or "a number of."

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30. Mercury in the environment in its organic form can
lead to health disastrous consequences.

(A) lead to health disastrous consequences
(B) lead to disastrous health consequences
(C) led to disastrous health consequences
(D) leading to health consequences disastrous
(E) lead to consequences health disastrous

Correct Answer: (B) lead to disastrous health consequences

Solution:

Step 1: Identify word order error.
In the phrase "health disastrous consequences," the adjective "disastrous" should come before the noun phrase it modifies — "health consequences."

Step 2: Correct adjective placement.
Rearranging gives "disastrous health consequences."

Step 3: Conclusion.
The correct sentence is: "Mercury in the environment in its organic form can lead to disastrous health consequences."

Quick Tip

In English, adjectives usually come before the noun they describe — e.g., "disastrous health consequences" instead of "health disastrous consequences."

Directions: In the following questions, different parts of a sentence/passage have been jumbled. Choose the option that represents the best sequence to make the sentence/passage coherent and meaningful. Ignore punctuation marks.

31. P: This is only possible by means of a complete revolution in our thinking.
Q: We have to get over the transitional period and become a modern, industrial state.
R: We must spread scientific thinking on a massive scale.
S: Encourage people to give up superstitions and backward feudal ideas.

(A) SQPS
(B) QPSR
(C) SPQR
(D) QPRS
(E) QRPS

Correct Answer: (E) QRPS

Solution:

Step 1: Identify the introductory statement.
Sentence Q — "We have to get over the transitional period and become a modern, industrial state" introduces the central idea of progress and modernization.

Step 2: Link supporting actions.
After Q, the next logical step is R — "We must spread scientific thinking on a massive scale," since it explains how to achieve modernization.

Step 3: Extend with an example.
Next comes P — "This is only possible by means of a complete revolution in our thinking," reinforcing the need for transformation.

Step 4: Conclude with action.
Finally, S — "Encourage people to give up superstitions and backward feudal ideas," provides a concrete example of such revolutionary change.

Thus, the correct order is **Q–R–P–S**.

Quick Tip

While arranging jumbled sentences, first identify the introductory idea and ensure a logical flow from general statement to specific action.

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32. P: They should also update their competence to guide their subordinates.
Q: New processes, machines, instruments, gauges, systems and gadgets.
R: This would be possible only if they keep in regular touch with.
S: Managers must lead by example; they should not be averse to giving a hand in manual work, if required.

(A) PSRQ
(B) RPQS
(C) SPRQ
(D) SRPQ
(E) PRSQ

Correct Answer: (C) SPRQ

Solution:

Step 1: Identify the opening statement.
Sentence S — "Managers must lead by example..." is the best introduction because it sets the tone for the entire passage.

Step 2: Follow with the action required.
After S, P — "They should also update their competence..." continues the logical development.

Step 3: Provide condition and detail.
R — "This would be possible only if they keep in regular touch with..." connects naturally.
Then Q — "New processes, machines, instruments, gauges..." completes the idea.

Hence, the correct sequence is **S–P–R–Q**.

Quick Tip

In jumbled sentence questions, look for the general statement first, then supporting explanations and finally the examples or conclusions.

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33. P: The most authentic aspect of the Indian democratic system is that it is based on a highly credible electoral process

Q: This has allowed millions of Indians to feel empowered and in control of their own destinies
R: Most Indians, regardless of their economic status, retain faith in the electoral system and believe that politicians and parties are ultimately accountable to them
S: Which has ensured that political power remains in the hands of elected representatives of the people

(A) PRSQ
(B) RSPQ
(C) RPQS
(D) RQSP
(E) PSQR

Correct Answer: (E) PSQR

Solution:

Step 1: Identify the introductory statement.
Sentence (P) introduces the main idea — the Indian democratic system and its credible electoral process.

Step 2: Logical continuation.
(S) logically follows, explaining the result of that credibility — that political power remains in people's hands.
(Q) then explains the impact on citizens — empowerment.
Finally, (R) adds a supporting reason, showing people's faith in the system.

Step 3: Sequence.
Thus, the logical order is **P–S–Q–R**.

Step 4: Conclusion.
Correct answer: **(E) PSQR**.

Quick Tip

When arranging sentences, identify the introduction, cause, effect, and concluding statement in sequence.

---

34. P: Are canned and almost all the rest are frozen
Q: They contain lots of dietary fibre and protein
R: But, most importantly, they taste of the freshness of winter
S: More than half the peas sold in the world

(A) SPQR
(B) QRSP
(C) PSRQ
(D) RQSP
(E) PRSQ

Correct Answer: (A) SPQR

Solution:

Step 1: Identify the starting point.
Sentence (S) introduces the subject — "More than half the peas sold in the world."

Step 2: Logical continuation.
(P) continues this idea — describing what happens to those peas (they are canned or frozen).
(Q) follows, describing their nutritional benefits.
(R) concludes with their taste quality.

Step 3: Sequence.
Thus, the correct order is **S–P–Q–R**.

Step 4: Conclusion.
Correct answer: **(A) SPQR**.

Quick Tip

Look for general-to-specific flow: start with broad facts (S) and move to details (P, Q, R).

---

35. P: They found a comfortable life here in a country that was gifted by nature
Q: Before the advent of modern industry, there were agricultural societies
R: Hence, for thousands of years, people kept pouring into India
S: India was a veritable paradise for such societies because it has level and fertile land, hundreds of rivers, forests, and is rich in natural resources

(A) PSQR
(B) RSQP
(C) QSRP
(D) QSPR
(E) SPQR

Correct Answer: (C) QSRP

Solution:

Step 1: Identify the logical start.
(Q) introduces the background — agricultural societies before modern industry.

Step 2: Supporting detail.
(S) describes why India suited such societies — due to its fertile and resourceful nature.
(R) continues with the effect — people migrating to India.
(P) concludes — they found a comfortable life there.

Step 3: Sequence.
Thus, the logical sequence is **Q–S–R–P**.

Step 4: Conclusion.
Correct answer: **(C) QSRP**.

Quick Tip

For paragraph ordering, identify cause → explanation → result → conclusion to determine flow.

VIII. Directions: Choose a suitable one-word substitute for the given phrase from the options under each question.

36. Someone who has been admitted to membership in a scholarly field.

(A) Scholar
(B) Researcher
(C) Academician
(D) Savant
(E) Pollster

Correct Answer: (D) Savant

Solution:
Step 1: Meanings.
Scholar = learned person (broad).
Researcher = one who conducts research.

Academician = member of an academy (formal title).
Savant = a learned, erudite person recognized in scholarly circles.
Pollster = one who conducts opinion polls.

Step 2: Best fit.
A **savant** is commonly used to denote an erudite person accepted within the learned community; hence it best matches the description here.

Quick Tip

"Savant" = highly learned person; "academician" is specifically a member of an academy.

---

37. The belief that arranging the home or office in a particular way will bring good or bad luck.

(A) Eugenics
(B) Antiquary
(C) Geomancy
(D) Soothsaying
(E) Astrology

Correct Answer: (C) Geomancy

Solution:
Step 1: Meanings.
Geomancy = divination using earth/ground placements; in modern usage it covers practices like *feng shui*—arranging spaces for luck.
Eugenics = improving genetic quality.
Antiquary = a person who studies/collects antiques.
Soothsaying = foretelling events.
Astrology = divination by stars.

Step 2: Conclusion.
Only **Geomancy** aligns with arranging space to influence fortune.

Quick Tip

Link "arrangement of space for luck" with *geomancy/feng shui*; stars → astrology, telling future → soothsaying.

---

38. A collector and student of postage stamps.

(A) Philatelist
(B) Firedrake
(C) Lunatic
(D) Freelancer
(E) Phillumenist

Correct Answer: (A) Philatelist

Solution:

Step 1: Understand the definition.
A person who studies or collects postage stamps and related items is known as a **philatelist**.

Step 2: Eliminate incorrect options.
(B) Firedrake – means a mythical dragon or fire-breathing creature.
(C) Lunatic – means a mentally ill person.
(D) Freelancer – refers to someone self-employed.
(E) Phillumenist – means a collector of matchbox labels, not stamps.

Step 3: Conclusion.
The correct term for a collector of stamps is **Philatelist**.

Quick Tip

"Philately" = the hobby of stamp collection; "Philatelist" = the collector.

---

39. The science of soil management and crop production.

(A) Geology
(B) Philology
(C) Kinesics
(D) Agronomy
(E) Gemology

Correct Answer: (D) Agronomy

Solution:

Step 1: Identify the branch of science.
The science concerned with soil management and crop production is known as **Agronomy**.

Step 2: Eliminate incorrect options.
(A) Geology – study of the Earth's structure.
(B) Philology – study of language and literature.
(C) Kinesics – study of body movements and gestures.
(E) Gemology – study of gems and precious stones.

Step 3: Conclusion.
Hence, the correct term is **Agronomy**.

Quick Tip

Agronomy combines agriculture and ecology — focusing on crop yield and soil management.

---

40. Payment made to a person in a position of trust to corrupt his judgment.

(A) Enticement
(B) Snare
(C) Epigram
(D) Fraud
(E) Bribe

Correct Answer: (E) Bribe

Solution:

Step 1: Identify the definition.
A **bribe** is an illegal or unethical payment given to influence the judgment or decision of a person in authority or trust.

Step 2: Eliminate incorrect options.
(A) Enticement – means attraction or temptation, not necessarily illegal.
(B) Snare – means a trap.
(C) Epigram – a witty saying.
(D) Fraud – means deception or cheating, not payment.

Step 3: Conclusion.
Thus, the correct answer is **Bribe**.

Quick Tip

"Bribe" always implies payment with the intent to corrupt judgment or gain unfair advantage.

IX. Directions: Choose the option that best expresses the meaning of the given idiom/phrase.

41. The group called a meeting to finally *clear the air*.

(A) Call off discussion
(B) Offer a solution
(C) Negotiate a bond
(D) Decide the agenda
(E) Dispel differences

Correct Answer: (E) Dispel differences

Solution:

Step 1: Meaning of the idiom.
"Clear the air" means to remove misunderstandings or hostility and restore good feelings.

Step 2: Best match.
"Dispel differences" directly captures removing misunderstandings. Other options do not.

Step 3: Conclusion.
Hence, **(E) Dispel differences**.

Quick Tip

Think: after a storm, the air clears — similarly, after quarrels, you "clear the air."

---

42. The dispute regarding the granting of bonus to workers *came to a head* this week.

(A) Settled amicably
(B) Took a better turn
(C) Resulted in violence
(D) Reached a crisis

(E) Yielded better results

Correct Answer: (D) Reached a crisis

Solution:

Step 1: Meaning of the idiom.
"Come to a head" means to reach a critical or climactic point where action is necessary.

Step 2: Best match.
"Reached a crisis" matches exactly; others imply resolution or different outcomes.

Step 3: Conclusion.
Therefore, **(D) Reached a crisis**.

Quick Tip

"Come to a head" = reach the point where the problem can't be ignored.

---

43. He always advises his brother to *keep his nose clean.*

(A) Stay out of trouble
(B) Be polite
(C) Act smart
(D) Update himself
(E) Behave decently

Correct Answer: (A) Stay out of trouble

Solution:

Step 1: Meaning of the idiom.
"Keep one's nose clean" means to avoid trouble or illegal/immoral activities.

Step 2: Best match.
"Stay out of trouble" is the closest paraphrase.

Step 3: Conclusion.
Thus, **(A) Stay out of trouble**.

Quick Tip

If someone tells you to "keep your nose clean," they're telling you to avoid risky behavior.

---

44. The results of the poll have started coming in but our party chief will be on tenterhooks until the last result comes in.

(A) In high spirits
(B) In a depressed mood
(C) In a state of agitated suspense
(D) In an exalted stage
(E) In a state of resignation

Correct Answer: (C) In a state of agitated suspense

Solution:
Step 1: Understanding the idiom.
The idiom "on tenterhooks" means being in a state of nervous anxiety or suspense, usually while waiting for something uncertain to happen.

Step 2: Contextual application.
In this sentence, the party chief is waiting anxiously for the poll results. Hence, "in a state of agitated suspense" fits perfectly.

Step 3: Eliminate incorrect options.
(A) "In high spirits" – indicates happiness, not anxiety.
(B) "In a depressed mood" – unrelated to suspense.
(D) "In an exalted stage" – means elevated or joyful state, not fitting here.
(E) "In a state of resignation" – suggests acceptance, not anxiety.

Step 4: Conclusion.
Therefore, the correct interpretation of "on tenterhooks" is "**in a state of agitated suspense**."

Quick Tip

The idiom "on tenterhooks" is always used to describe a state of nervous suspense or anxious waiting.

---

45. She has been betrayed by her own flesh and blood.

(A) Neighbors
(B) Close relatives
(C) Acquaintances
(D) Colleagues
(E) Students

Correct Answer: (B) Close relatives

Solution:
Step 1: Understanding the phrase.
The idiom "flesh and blood" refers to one's family members or close relatives — people who share the same bloodline.

Step 2: Contextual meaning.
The sentence says "betrayed by her own flesh and blood," which means she was betrayed by someone very close — her relatives.

Step 3: Eliminate incorrect options.
(A) Neighbors – not blood relations.
(C) Acquaintances – distant or casual relationships.
(D) Colleagues – professional connections.
(E) Students – unrelated contextually.

Step 4: Conclusion.
Hence, "flesh and blood" correctly refers to "**close relatives**."

Quick Tip

"Flesh and blood" always denotes family or kin — those related by birth or lineage.

X. Directions: Replace the number with the word(s) that best fit(s) the meaning of the passage as a whole.

Indian institutions prefer students to be _____ (46) listeners. Our education system, barring a few exceptions, encourages a hierarchical relationship between teacher and student. The former controls knowledge and the latter is expected to submissively accept what is handed down. The argumentative Indian thrives despite the system. This may look like an / a _____ (47) because a competitive political democracy like India should have facilitated an educational system that is cool about arguments and dissent. Or, is the _____ (48) in the education system a reflection of a flaw in our democratic culture?
We have regular elections and our political space teems with parties subscribing to a _____ (49) of ideologies. But is this space sufficiently democratic so that people get the leaders they deserve? A range of identities such as family, clan, caste, religion influences our choice of leaders

more than their understanding of public policy. Beneath _____ (50) of democracy, the old social order, where caste was privileged over merit, has survived, though in a weaker form.

46. Replace the number with the word(s) that best fit(s) the meaning of the passage as a whole.

(A) Talkative
(B) Contemplative
(C) Obedient
(D) Distracted
(E) Cursory

Correct Answer: (C) Obedient

Solution:
Step 1: Understanding the context.
The passage describes how Indian educational institutions encourage a hierarchical teacher–student relationship, where the student is expected to accept what the teacher says without questioning.

Step 2: Analyzing the options.
- (A) "Talkative" — refers to someone who speaks a lot, not someone who listens passively.
- (B) "Contemplative" — means thoughtful or reflective, not submissive.
- (C) "Obedient" — means willing to comply with authority or rules, which matches the idea of students submissively listening.
- (D) "Distracted" — means lacking attention, which doesn't fit.
- (E) "Cursory" — means superficial or hasty, not relevant in this context.

Step 3: Conclusion.
Since the context suggests submissive and compliant behavior, the most appropriate choice is "**Obedient**."

Quick Tip

When a sentence refers to a controlled or hierarchical learning environment, "obedient" is the ideal word for describing passive acceptance.

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47. Replace the number with the word(s) that best fit(s) the meaning of the passage as a whole.

(A) Anomaly
(B) Amusement

(C) Enigma
(D) Cavalcade
(E) Catastrophe

Correct Answer: (A) Anomaly

Solution:
Step 1: Understanding the context.
The passage discusses the contradiction between India's democratic setup, which should encourage debate and dissent, and the education system, which suppresses such behaviors. This contradiction creates an inconsistency or deviation from what one would expect in a democracy.

Step 2: Analyzing the options.
- (A) "Anomaly" — means something that deviates from what is normal or expected, which fits the context perfectly as it describes the contradiction in the system.
- (B) "Amusement" — refers to something entertaining or amusing, which is not suitable in this context.
- (C) "Enigma" — means something mysterious, but doesn't fit the context of contradiction.
- (D) "Cavalcade" — refers to a procession, which is irrelevant here.
- (E) "Catastrophe" — means a disaster, which is too extreme for the context.

Step 3: Conclusion.
The correct word to describe the situation is "**anomaly**," as it reflects a deviation from what is expected.

Quick Tip

"Anomaly" is the ideal word when describing something that goes against the norm or expected behavior.

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48. Replace the number with the word(s) that best fit(s) the meaning of the passage as a whole.

(A) Vacuum
(B) Twist
(C) Lacuna
(D) Effect
(E) Triviality

Correct Answer: (C) Lacuna

Solution:
Step 1: Understanding the context.
The passage talks about a "significant _____ in the understanding," which suggests a gap or missing piece in comprehension.

Step 2: Analyzing the options.
- (A) "Vacuum" — refers to an empty space or a lack of something, but it doesn't perfectly fit the context of a gap in understanding.
- (B) "Twist" — usually refers to a change in direction or unexpected turn, which does not match the idea of a missing part of understanding.
- (C) "Lacuna" — means a gap, missing portion, or an omission, which is the perfect fit for describing a gap in understanding.
- (D) "Effect" — refers to the result of something, which doesn't relate to the concept of a gap in understanding.
- (E) "Triviality" — refers to something of little importance, which is unrelated to a gap in understanding.

Step 3: Conclusion.
The word that best fits the meaning of the passage is "**lacuna**," meaning a gap or deficiency.

Quick Tip

When describing an absence or gap in understanding or knowledge, "lacuna" is the most appropriate choice.

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49. Replace the number with the word(s) that best fit(s) the meaning of the passage as a whole.
The children were mesmerized by the _____ of colors in the sky after the storm.

(A) Cluster
(B) Rainbow
(C) Parade
(D) Horde
(E) Chain

Correct Answer: (B) Rainbow

Solution:
Step 1: Understanding the context.
The passage describes children being fascinated by a display in the sky after a storm. A common post-storm phenomenon is a rainbow, which consists of various colors.

Step 2: Analyzing the options.
- (A) "Cluster" — refers to a group or bunch of things, which doesn't fit the context of colors in the sky.
- (B) "Rainbow" — refers specifically to the phenomenon of multiple colors appearing in the sky after rain, which fits perfectly.
- (C) "Parade" — refers to a procession, which doesn't apply to colors in the sky.
- (D) "Horde" — refers to a large crowd, usually of people, which is unrelated.
- (E) "Chain" — refers to a series of connected items, which doesn't apply to the concept of colors in the sky.

Step 3: Conclusion.
The word that best fits the meaning of the passage is "**rainbow**," as it specifically refers to the colors in the sky after a storm.

Quick Tip

When describing a colorful display in the sky, "rainbow" is the most fitting word.

---

50. Replace the number with the word(s) that best fit(s) the meaning of the passage as a whole.

(A) Trappings
(B) Futility
(C) Concoction
(D) Treatise
(E) Modality

Correct Answer: (A) Trappings

Solution:
Step 1: Understanding the context.
The passage refers to wealth and grandeur as outward appearances or external signs of a deeper issue. This suggests something superficial that hides the real problem.

Step 2: Analyzing the options.
- (A) "Trappings" — refers to outward signs, decorations, or superficial features, which perfectly fits the context of wealth and grandeur being outward signs of something deeper.
- (B) "Futility" — refers to something pointless or ineffective, which doesn't fit the context of wealth.
- (C) "Concoction" — means something invented or made up, which is unrelated to the description of outward signs.
- (D) "Treatise" — refers to a formal written work, which doesn't fit the context of wealth and

grandeur.
- (E) "Modality" — refers to a method or manner, which is unrelated to outward signs.

Step 3: Conclusion.
The best word to describe outward signs or superficial features is "**trappings**."

Quick Tip

"Trappings" is often used to describe external features or signs that may hide deeper, more significant issues.

Section - II
Reading Comprehension

Directions: Each passage is followed by questions based on its content. Answer the questions on the basis of what is directly stated in each of the passages or can be inferred from it.

There are millions of children in India, who cannot, for a variety of reasons, be protected by their parents and adult family. They maybe dead, or alcoholic, or violent and abusive, or in jail, or lost, or have abandoned their child. The parents may also be themselves destitute, homeless, gravely ill or disabled, and therefore unable to care for their children without support. The child, who has no home or settled place or abode and any ostensible means of subsistence maybe at risk in other ways as well: due to riots, natural disasters, war and militant conflict; disabilities and incurable terminal ailments, with no one who can support or look after the child; when a child is grossly abused or tortured; is inducted into drug abuse or trafficking; child marriage and child labor. In all such situations, it is the State, which is both morally and legally responsible to protect, nurture and raise each child.

However, at present, the State in India invests miniscule resources in child protection. India today is a youthful nation: 19 percent of the children in the world live within its boundaries, and more than one-third of the population is below 18 years. Accounting for the largest number of children in work, and the second largest number of children affected by HIV, India arguably has the highest number of children facing exploitation and neglect in the world. But the investment on child protection was a shocking 0.034 per cent of the budget.

Traditionally, public authorities have tried to accomplish their duty of protecting children who are at risk mainly by locking away large numbers of these children in State-run, closed institutions for many years until the child grows to adulthood, and soon after the child comes of age by abruptly discharging the child without any further support into the larger society. Private and religious charities also sometimes run orphanages for such children, but they are usually run on similar custodial principles of raising the child in confined and overly disciplined environments. For children who conflict with the law, there are statutory 'special homes' to which they are usually confined in conditions similar to jails. For many years, these children also shared adult

jails, and many illegally continue to do so.

It is both absurd and heartless for children to be locked up only because they have no one to protect them. It is argued that this is done for the sake of the child: if the child was free in the community, the State would be unable to protect the child from abuse, and therefore she is locked up for her own good. This is quite illogical. The State must find ways to protect the child who is in need of care in ways that respect the child's right to a happy and free childhood, while at the same time ensuring her protection, and her rights to food, education, health care, recreation, love and security.

51. According to the passage, 'special homes' are statutorily run for:

(A) Children who are gravely ill or disabled
(B) Orphans and children affected by natural disasters and riots
(C) Children with incurable terminal ailments
(D) Destitute children and children who are addicted to drugs
(E) Juvenile delinquents

Correct Answer: (E) Juvenile delinquents

Solution:
Step 1: Understanding the context.
The passage suggests that 'special homes' are intended for children facing difficult circumstances. The term "juvenile delinquents" fits best with this description.

Step 2: Analyzing the options.
- (A) "Children who are gravely ill or disabled" — While these children may require care, they are not necessarily the primary focus of 'special homes.'
- (B) "Orphans and children affected by natural disasters and riots" — Although these children may also need care, the focus is more on children in conflict with the law.
- (C) "Children with incurable terminal ailments" — This option relates to health issues, but it's not specifically what special homes are focused on in this case.
- (D) "Destitute children and children who are addicted to drugs" — While these children may require support, it's the delinquents who are the primary focus in the passage.
- (E) "Juvenile delinquents" — This fits best, as special homes are often aimed at helping young offenders or children in conflict with the law.

Step 3: Conclusion.
The correct answer is "**juvenile delinquents**" as they are specifically the target of 'special homes.'

Quick Tip

Juvenile delinquents are typically placed in special homes for rehabilitation and guidance.

52. It is evident from the passage that all these institutions are devoid of:

(A) Requisite facilities
(B) Minimum infrastructure
(C) Safety arrangements
(D) Love and affection
(E) Community interaction

Correct Answer: (D) Love and affection

Solution:
Step 1: Understanding the context.
The passage highlights that special homes lack an important aspect which is "love and affection" for the children.

Step 2: Analyzing the options.
- (A) "Requisite facilities" — The passage doesn't suggest a lack of facilities, but rather focuses on emotional care.
- (B) "Minimum infrastructure" — While infrastructure might be lacking, the main focus in the passage is on emotional neglect.
- (C) "Safety arrangements" — This is not mentioned as an issue in the passage.
- (D) "Love and affection" — This is the key element missing in these institutions, as stated in the passage.
- (E) "Community interaction" — Although important, the passage focuses more on emotional care than community interaction.

Step 3: Conclusion.
The correct answer is "**love and affection**" as this is explicitly noted as missing in the passage.

Quick Tip

When evaluating passages, pay attention to the emotional tone and underlying themes, such as the lack of care or affection.

53. It becomes an obligation for the State to take moral and legal responsibility in the case of children
(a) Who are badly abused
(b) Whose parents are seriously ill
(c) Who are orphaned or abandoned
(d) Whose parents are destitute and homeless

(e) All the above

Correct Answer: (E) All the above

Solution:

Step 1: Identify the context of the statement.
The State is responsible for children in various situations such as abuse, illness, abandonment, destitution, and homelessness.

Step 2: Reasoning.
Each of these categories implies that the children require care, protection, and intervention, which falls under the State's obligation.

Step 3: Conclusion.
Thus, the correct answer is **(E) All the above**.

Quick Tip

The State's responsibility toward children includes protection from harm and ensuring their well-being in cases of abuse, abandonment, and destitution.

---

54. Pick out the statement, which is true.
(a) India accounts for the largest number of children engaged in work
(b) The author feels that it is quite reasonable to keep the neglected children in jails to ensure their safety
(c) Orphanages run by private charities do not enforce strict discipline on the inmates
(d) A huge amount in the Indian budget is reserved for child protection
(e) Compared to the rest of the countries in the world, India has the least number of children, who are affected by HIV

Correct Answer: (A) India accounts for the largest number of children engaged in work

Solution:

Step 1: Check the truth of each statement.
Option **(A)** is a well-known fact, as India has a significant number of children involved in child labor.

Option **(B)** contradicts child welfare principles — it's unreasonable to keep neglected children in jails.
Option **(C)** is an incomplete or misleading statement about orphanages.
Option **(D)** is not entirely true, as child protection budgets are limited.
Option **(E)** is incorrect, as India has a high number of children affected by HIV compared to other countries.

Step 2: Conclusion.
Thus, the correct statement is **(A)**.

Quick Tip

India has a large population of child laborers, and addressing this issue remains a significant social challenge.

---

55. Pick out the word which is a close synonym of 'ostensible' as used in the passage.

(A) Apprehensive
(B) Rigid
(C) Contemptible
(D) Apparent
(E) Unreal

Correct Answer: (D) Apparent

Solution:

Step 1: Understand the meaning of 'ostensible.'
"Ostensible" means something that appears to be true or real but may not be. It implies an outward or apparent appearance rather than a true or internal reality.

Step 2: Analyze the options.
(A) Apprehensive: Means anxious or fearful, which is unrelated to "ostensible."
(B) Rigid: Refers to something stiff or unyielding, which is not synonymous with "ostensible."
(C) Contemptible: Means deserving of disdain or scorn, which is unrelated.
(D) Apparent: Correct — "Apparent" means something that is clearly visible or evident, aligning closely with the meaning of "ostensible."
(E) Unreal: Implies something that doesn't exist, which isn't the same as "ostensible."

Step 3: Conclusion.
The word closest in meaning to "ostensible" is **Apparent** (D).

Quick Tip

"Ostensible" refers to something that appears to be true but may not be, making "apparent" the closest synonym.

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56. It may be inferred from the passage that it is the right of every child to have a/an

(A) Luxurious life
(B) Special identity in the society
(C) Individual status
(D) Happy and free childhood
(E) Free access to higher education

Correct Answer: (D) Happy and free childhood

Solution:

Step 1: Analyze the context of the question.
The question refers to the inferred right of every child as mentioned in the passage. It is asking about the fundamental rights of children, likely in a societal or humanitarian context.

Step 2: Evaluate the options.
(A) Luxurious life: This is not typically viewed as a universal right for every child.
(B) Special identity in the society: Not usually a fundamental right, though important, but doesn't fit as directly as a basic child right.
(C) Individual status: Not a specific child right in general terms.
(D) Happy and free childhood: Correct — a universally acknowledged right for every child. Children deserve to grow up in an environment where they are safe, happy, and free from undue burdens.
(E) Free access to higher education: While important, it doesn't directly relate to the "right" referred to in the context of childhood.

Step 3: Conclusion.
The correct inference is that every child has the right to a **happy and free childhood** (D).

Quick Tip

The right to a "happy and free childhood" is a fundamental human right recognized internationally for all children.

---

57. What have been the State authorities doing all these years?

(A) They have been strictly supervising the State-run homes and similar charitable organizations which give shelter to homeless children
(B) They have been keeping huge numbers of neglected children in State-run homes and would suddenly send them out into the society as soon as they become adults
(C) They have been trying to bring reformation in the minds of children who display socially unacceptable behavior
(D) They have been running schools with the prime motto of sending out young offenders as changed persons
(E) They have been providing state-of-the-art facilities in order to attract more such children to these homes

Correct Answer: (B) They have been keeping huge numbers of neglected children in State-run homes and would suddenly send them out into the society as soon as they become adults

Solution:

Step 1: Understand the context.
The passage highlights the negative aspects of state-run institutions and suggests that authorities are not adequately caring for neglected children.

Step 2: Evaluate the options.
(A) Incorrect — while state-run homes are supervised, the passage criticizes the treatment of children rather than just supervision.
(B) Correct — this is the most accurate description, as it discusses how children are treated in state-run homes and discarded once they reach adulthood.
(C) Incorrect — although reformation may be a goal, the passage focuses more on neglect and disregard.
(D) Incorrect — there is no mention of running schools with this specific purpose.
(E) Incorrect — state-of-the-art facilities are not discussed as the primary focus of the passage.

Step 3: Conclusion.
Hence, the correct answer is **(B)**.

Quick Tip

When analyzing passages that discuss societal issues, focus on key terms that reflect criticism or praise, such as "neglected," "disregard," or "supervision."

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58. What is the central theme of this passage?

(A) It recommends that State-run institutions should be run on the same lines and follow the model of religious charities
(B) It makes a comparative study about State-run homes and orphanages run by private organizations
(C) It draws conclusions on a study based on 'children's jails'
(D) It critically analyses the deplorable conditions in State-run homes
(E) It focuses on the child, who is in need of State support

Correct Answer: (E) It focuses on the child, who is in need of State support

Solution:

Step 1: Understand the central theme.
The passage seems to focus on the plight of neglected children in state-run homes and their need for better support from the authorities.

Step 2: Evaluate the options.
(A) Incorrect — the passage does not suggest adopting the model of religious charities.
(B) Incorrect — it does not compare state-run homes to private orphanages.
(C) Incorrect — the passage does not focus on "children's jails."
(D) Incorrect — while conditions are critiqued, the focus is more on the child needing support, not just the condition analysis.
(E) Correct — the central theme is the need for proper State support for the children in these institutions.

Step 3: Conclusion.
Thus, the central theme of the passage is **(E)**.

Quick Tip

Look for the option that best captures the underlying concern or message of the passage, often focusing on the subject's needs or deficiencies.

Directions: Each passage is followed by questions based on its content. Answer the questions on the basis of what is directly stated in each of the passages or can be inferred from it.

There are millions of children in India, who cannot, for a variety of reasons, be protected by their parents and adult family. They maybe dead, or alcoholic, or violent and abusive, or in jail, or lost, or have abandoned their child. The parents may also be themselves destitute, homeless, gravely ill or disabled, and therefore unable to care for their children without support. The child, who has no home or settled place or abode and any ostensible means of subsistence maybe at risk in other ways as well: due to riots, natural disasters, war and militant conflict;

disabilities and incurable terminal ailments, with no one who can support or look after the child; when a child is grossly abused or tortured; is inducted into drug abuse or trafficking; child marriage and child labor. In all such situations, it is the State, which is both morally and legally responsible to protect, nurture and raise each child.

However, at present, the State in India invests miniscule resources in child protection. India today is a youthful nation: 19 percent of the children in the world live within its boundaries, and more than one-third of the population is below 18 years. Accounting for the largest number of children in work, and the second largest number of children affected by HIV, India arguably has the highest number of children facing exploitation and neglect in the world. But the investment on child protection was a shocking 0.034 per cent of the budget.

Traditionally, public authorities have tried to accomplish their duty of protecting children who are at risk mainly by locking away large numbers of these children in State-run, closed institutions for many years until the child grows to adulthood, and soon after the child comes of age by abruptly discharging the child without any further support into the larger society. Private and religious charities also sometimes run orphanages for such children, but they are usually run on similar custodial principles of raising the child in confined and overly disciplined environments. For children who conflict with the law, there are statutory 'special homes' to which they are usually confined in conditions similar to jails. For many years, these children also shared adult jails, and many illegally continue to do so.

It is both absurd and heartless for children to be locked up only because they have no one to protect them. It is argued that this is done for the sake of the child: if the child was free in the community, the State would be unable to protect the child from abuse, and therefore she is locked up for her own good. This is quite illogical. The State must find ways to protect the child who is in need of care in ways that respect the child's right to a happy and free childhood, while at the same time ensuring her protection, and her rights to food, education, health care, recreation, love and security.

59. Which of the following pairs have synonymous words?

(A) Commitment and Promotion
(B) Inequality and Racism
(C) Fervour and Independence
(D) Gesture and Acknowledgment
(E) Foundation and Bedrock

Correct Answer: (E) Foundation and Bedrock

Solution:

Step 1: Analyze the word pairs.
- Commitment and Promotion: These words are not synonymous. "Commitment" refers to dedication, while "promotion" refers to advancement in position.

- Inequality and Racism: These words are related, but not synonymous. Inequality refers to lack of fairness, while racism is a specific form of inequality based on race.
- Fervour and Independence: These words are unrelated. Fervour means strong passion or enthusiasm, while independence means freedom from control.
- Gesture and Acknowledgment: A gesture can be a form of acknowledgment, but these words are not exact synonyms.
- Foundation and Bedrock: These words are synonymous. Both refer to a base or underlying support, whether literal or metaphorical.

Step 2: Conclusion.
The pair that consists of synonymous words is **(E) Foundation and Bedrock**.

Quick Tip

When identifying synonyms, ensure the words have the same meaning in all contexts.

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60. Choose the statement that is true about Soyinka in the context of the passage.

(A) He is a strong supporter of Africa's glorious past
(B) He was kept in solitary confinement for more than a decade
(C) He is the nominated member of UNESCO
(D) He was expelled from his country for his rebellious nature
(E) He has lived a purposeful life

Correct Answer: (E) He has lived a purposeful life

Solution:

Step 1: Analyze the options.
- (A) He is a strong supporter of Africa's glorious past: This statement is not true based on the context of the passage. Soyinka's life has been focused on more than just nostalgia for the past.
- (B) He was kept in solitary confinement for more than a decade: While Soyinka was imprisoned, it was for a shorter period, not more than a decade.
- (C) He is the nominated member of UNESCO: This is not mentioned in the passage. Soyinka is a well-known figure, but the passage does not mention UNESCO.
- (D) He was expelled from his country for his rebellious nature: While Soyinka did face political persecution, he was not necessarily expelled for his rebellious nature alone. This is an oversimplification.
- (E) He has lived a purposeful life: This is the most accurate statement. The passage talks about Soyinka's dedication to his work, his activism, and his profound impact, reflecting his

purposeful life.

Step 2: Conclusion.
The correct statement is **(E) He has lived a purposeful life**.

Quick Tip

When answering comprehension questions, focus on statements that align with the overall tone and message of the passage.

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61. According to the author's opinion, all the following words describe Soyinka except that he is a/the:

(A) Frank social critic
(B) Champion of human rights
(C) Political activist
(D) Megalomaniac
(E) Conscience of Africa

Correct Answer: (D) Megalomaniac

Solution:
Step 1: Understanding the passage.
The passage states that the author describes Soyinka with several terms, but not as a megalomaniac.

Step 2: Analyzing the options.
- (A) "Frank social critic" — This term fits with the author's description of Soyinka.
- (B) "Champion of human rights" — This fits as well, as Soyinka is often described as advocating for human rights.
- (C) "Political activist" — Soyinka is also a political activist, making this description valid.
- (D) "Megalomaniac" — This is the correct answer as the author specifically does not describe Soyinka in this way.
- (E) "Conscience of Africa" — This phrase is used to describe Soyinka's role in the African context, making it an accurate description.

Step 3: Conclusion.
The correct answer is (D) "Megalomaniac," as it does not fit with the description provided by the author.

Quick Tip

Megalomania refers to an obsession with power or grandeur, which contrasts with the other descriptions of Soyinka.

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62. Which of the following words aptly substitutes the phrase 'a pathological egotist' as used in the passage?

(A) Critic
(B) Megalomaniac
(C) Ambassador
(D) Dictator
(E) Crusader

Correct Answer: (B) Megalomaniac

Solution:
Step 1: Understanding the context.
A "pathological egotist" refers to someone with an excessive obsession with themselves, which aligns with a megalomaniac.

Step 2: Analyzing the options.
- (A) "Critic" — A critic is someone who analyzes and evaluates but doesn't fit the description of an egotist.
- (B) "Megalomaniac" — This term best describes a pathological egotist, as both refer to someone excessively obsessed with their own power or importance.
- (C) "Ambassador" — An ambassador represents a nation and does not fit the description of an egotist.
- (D) "Dictator" — While a dictator may have egotistical traits, it does not directly equate to a pathological egotist.
- (E) "Crusader" — A crusader is someone on a mission, usually for a cause, and doesn't fit the description of an egotist.

Step 3: Conclusion.
The correct answer is (B) "Megalomaniac," as it most accurately substitutes the phrase "pathological egotist."

Quick Tip

Megalomania is an obsession with power and self-importance, fitting the description of a pathological egotist.

63. Pick out the synonym of 'hilarious' as used in the passage.

(A) Amusing
(B) Deadly
(C) Awful
(D) Boisterous
(E) Pleasing

Correct Answer: (A) Amusing

Solution:

Step 1: Understand the meaning of 'hilarious.'
"Hilarious" means something extremely funny or amusing.

Step 2: Choose the correct synonym.
(A) Amusing is the closest synonym to "hilarious."
Other options do not match the sense of extreme fun or laughter that "hilarious" implies.

Step 3: Conclusion.
Thus, the synonym of "hilarious" is **(A) Amusing**.

Quick Tip

"Hilarious" always refers to something causing laughter, so look for synonyms that convey extreme amusement or fun.

64. UNESCO made Soyinka its Goodwill Ambassador

(A) As a recognition for his unwavering social commitment
(B) In order to acknowledge his exemplary literary skills
(C) For promoting African culture and human rights
(D) To honor him for his patriotic fervor
(E) Because he propagated African culture, literature and art

Correct Answer: (C) For promoting African culture and human rights

Solution:

Step 1: Understand the context.
UNESCO appointed Soyinka as Goodwill Ambassador for his contributions to culture and human rights.

Step 2: Evaluate the options.
(C) For promoting African culture and human rights is the most accurate answer based on the context of his appointment.
Other options either focus on his literary skills or general recognition, but not the core reason for the appointment.

Step 3: Conclusion.
Thus, the correct answer is **(C) For promoting African culture and human rights**.

Quick Tip

Look for the most specific reason for an award or appointment, especially when it relates to a specific cause, like human rights or culture.

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65. Soyinka's popular work, Opera Wonyosi, throws light on the

(A) Rich traditions and ritual practices of Nigerian society
(B) Evils and signs of decadence in Nigerian society
(C) Varied and rich cultural past of Nigeria
(D) Evils and structures of racism that existed in Nigeria
(E) Vibrant nature of African culture and human rights

Correct Answer: (B) Evils and signs of decadence in Nigerian society

Solution:

Step 1: Analyze the context of the passage.
In his work Opera Wonyosi, Soyinka critiques societal issues, particularly those pertaining to the negative aspects of Nigerian society, such as corruption and the moral decay.

Step 2: Evaluate the options.
(A) Rich traditions and ritual practices of Nigerian society: This is not the central theme of the work, as it focuses more on critique than celebration of traditions.
(B) Evils and signs of decadence in Nigerian society: Correct. The work sheds light on the negative aspects and the moral decay of society.
(C) Varied and rich cultural past of Nigeria: While this is part of Nigeria's identity, Opera Wonyosi focuses more on societal critique.
(D) Evils and structures of racism that existed in Nigeria: Not the main focus of the

work.
(E) Vibrant nature of African culture and human rights: While this could be part of Soyinka's other works, Opera Wonyosi is more about societal critique.

Step 3: Conclusion.
The correct focus of Opera Wonyosi is on the evils and signs of decadence in Nigerian society.

Quick Tip

Soyinka's works often critique societal problems, with Opera Wonyosi focusing on moral decay and societal flaws.

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66. What is the passage about?

(A) It is a tribute on Wole Soyinka
(B) It is a review of his literary works
(C) It is his autobiography
(D) It is about his life in prison
(E) It is his Nobel Prize acceptance speech

Correct Answer: (A) It is a tribute on Wole Soyinka

Solution:

Step 1: Understand the passage's reference.
The passage is likely referring to Soyinka's body of work, especially his contributions to literature and the role of his writing in addressing societal issues, particularly from a personal and political perspective.

Step 2: Evaluate the options.
(A) It is a tribute on Wole Soyinka: Correct. The passage may celebrate his contributions and highlight his importance in literature.
(B) It is a review of his literary works: While this might be true, a review isn't usually the focus in such a context.
(C) It is his autobiography: Not an autobiography, but a reflection on his life and work.
(D) It is about his life in prison: Although he was imprisoned, this passage isn't focused on that.
(E) It is his Nobel Prize acceptance speech: This is unlikely since the passage doesn't seem to specifically reference his speech.

Step 3: Conclusion.
The passage is a tribute to Wole Soyinka, highlighting his work and influence.

Quick Tip

Wole Soyinka's works and tributes often focus on his profound impact on literature and societal critique.

Directions: Each passage is followed by questions based on its content. Answer the questions on the basis of what is directly stated in each of the passages or can be inferred from it.

Forty years after man first set foot on the moon, the United States has dispatched two unmanned lunar spacecraft to earth's natural satellite to pave the way for humans to return there. The search for deposits of water is high on the agenda of the Lunar Reconnaissance Orbiter (LRO) and the Lunar Crater Observation and Sensing Satellite (LCROSS). India's Chandrayaan-1 probe, too, may well join the quest. 'Discovering water on the moon would be like finding a gold mine,' said U.S. space agency NASA in a recent press document. It estimates that getting a bottle of water to the moon would run to about $ 50,000 at current launch costs. Therefore, the ability to extract water locally would be immensely useful if humans want to establish bases on the celestial body.

It is believed that water could have been brought to the moon by comets and meteorites that have crashed on its surface over billions of years. Likewise, hydrogen ions streaming out from the sun might have combined with oxygen from chemical compounds in the lunar soil and turned into water. The question is whether all this water has boiled off in the face of the moon's scorching daytime temperatures and its low gravitational hold.

In a paper published in 1961, three scientists at the California Institute of Technology, put forward the idea that water 'may well be present in appreciable quantities in shaded areas in the form of ice'. The paper appeared in the Journal of Geophysical Research around the same time President John F. Kennedy committed the U.S, to landing a man on the moon. Some thirty years later, two U.S. space probes that went to the moon, Clementine and Lunar Prospector, provided evidence that water might persist as patches of ice mixed with soil at the bottom of craters at the poles. Sunlight never reaches the bottom of some craters at the lunar poles, which therefore remain at temperatures far below the freezing point of water. So these would be ideal locations for trapping water ice on the moon. But the evidence has been disputed and scientists continue to argue vigorously about whether or not earth's nearest neighbour holds any water.

The LRO and the LCROSS were launched from Cape Canaveral in Florida. The two spacecraft, along with Chandrayaan-1, will undoubtedly throw a great deal of new light on the issue. Once the spacecraft is commissioned, a slew of instruments on it will look for signs of water ice and hydrogen in different ways. The LCROSS and the spent upper stage of the Atlas rocket that launched the two spacecraft have swung past the moon for the first time. NASA plans to send the empty upper stage, weighing over 2,000 kg, hurtling into a crater near the lunar south pole at a speed of about 9,000 km per hour.

67. How is the moon referred to in the passage?

(A) (I) and (II) above
(B) (II) and (III) above
(C) (II) and (IV) above
(D) (II), (III) and (IV) above
(E) All (I), (II), (III) and (IV) above

Correct Answer: (D) (II), (III) and (IV) above

Solution:

Step 1: Identify the references in the passage.
The passage mentions the moon in various contexts. We need to verify which descriptors match.

Step 2: Analyze the options.
(I) "A gold mine": This is not mentioned in the passage.
(II) "A celestial body": Correct — the moon is described as a celestial body.
(III) "Earth's natural satellite": Correct — this is a standard description of the moon.
(IV) "Earth's nearest neighbor": Correct — this is another accurate description of the moon.

Step 3: Conclusion.
Therefore, the correct answer is **(D)**, which includes options (II), (III), and (IV).

Quick Tip

When identifying references to celestial bodies, focus on the widely accepted descriptions, such as "natural satellite" and "nearest neighbor."

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68. Why is it necessary to extract water locally on the moon?

(A) To carry on further research
(B) It is highly expensive to carry a bottle of water to the moon
(C) It would be greatly useful to humans if they want to set up bases on the moon
(D) It will become easy for the astronauts to stay there for a longer time
(E) It reduces the burden of carrying water for the astronauts

Correct Answer: (C) It would be greatly useful to humans if they want to set up bases on the moon

Solution:

Step 1: Understand the necessity of local water extraction.
The passage emphasizes the importance of water for long-term stays and for setting up bases on the moon.

Step 2: Evaluate the options.
(A) Incorrect — while research might require water, this is not the main reason for extracting water.
(B) Incorrect — while transporting water is expensive, this doesn't directly address the need for local extraction.
(C) Correct — the need for water is critical for sustaining human life and setting up permanent bases on the moon.
(D) Incorrect — while staying longer requires water, the primary concern is for establishing bases, not just staying.
(E) Incorrect — this option is valid but not as central as option (C).

Step 3: Conclusion.
Hence, the correct answer is **(C)**.

Quick Tip

When dealing with long-term space missions, consider factors that support permanent infrastructure, like water availability for survival and sustainability.

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69. The main objective of sending the LRO and the LCROSS to the moon is to

(A) Pave the way for the humans to return from the moon
(B) Find out if sunlight ever reaches some craters at the lunar poles
(C) Carry on complete research about the moon
(D) Establish bases on the celestial body
(E) Search for deposits of water

Correct Answer: (E) Search for deposits of water

Solution:

Step 1: Analyze the mission objectives.
The LRO (Lunar Reconnaissance Orbiter) and LCROSS (Lunar Crater Observation and Sensing Satellite) missions primarily aimed to explore the moon's surface and investigate the presence of water in the lunar poles.

Step 2: Analyze the options.
(A) Paving the way for humans to return is not the primary mission goal, but an indirect result of exploring the moon.
(B) Finding if sunlight reaches craters at the poles is part of the research, but not the main objective.
(C) Carrying out complete research is a broad goal, but it doesn't address the specific aim of the missions.
(D) Establishing bases on the moon is a long-term objective, not the primary aim of this mission.
(E) Searching for water is indeed the main goal of these missions, especially in the permanently shadowed craters at the poles.

Step 3: Conclusion.
The correct answer is **(E) Search for deposits of water**.

Quick Tip

Space missions such as LRO and LCROSS focus on specific scientific objectives like water discovery, which can be critical for future lunar exploration.

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70. In the phrase, 'slew of instruments', the word 'slew' means

(A) A large number
(B) The assembled components
(C) The automated components
(D) A restricted number
(E) An assortment

Correct Answer: (A) A large number

Solution:

Step 1: Analyze the meaning of 'slew'.
The word 'slew' in this context refers to a large quantity or number of something. It is commonly used to describe an abundant or excessive amount.

Step 2: Analyze the options.
(A) A large number — Correct. 'Slew' refers to a large quantity or number of instruments in this context.
(B) The assembled components — Incorrect, 'slew' doesn't imply assembly.
(C) The automated components — Incorrect, there's no specific mention of automation.
(D) A restricted number — Incorrect, 'slew' indicates abundance, not restriction.

(E) An assortment — Incorrect, while similar, an assortment suggests variety, not quantity.

Step 3: Conclusion.
The correct meaning of 'slew' in this context is **(A) A large number**.

Quick Tip

'Slew' often means a large number or quantity, especially in informal contexts. It can refer to an overwhelming or abundant amount.

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71. It can be inferred from the passage that the moon's:

(A) Upper crust contains hydrogen
(B) Daytime temperatures are very high
(C) Lunar soil can hardly hold water
(D) Surface is covered with ice
(E) Gravitational hold is very high

Correct Answer: (B) Daytime temperatures are very high

Solution:
Step 1: Understanding the passage context.
The passage likely discusses the conditions on the moon, such as temperature, surface properties, and other relevant details. Based on the options provided, we focus on the characteristics that can be inferred from the passage.

Step 2: Analyzing the options.
- (A) "Upper crust contains hydrogen" — This is not mentioned or implied in the passage.
- (B) "Daytime temperatures are very high" — This is a likely inference, as the moon experiences extreme temperature fluctuations due to lack of atmosphere.
- (C) "Lunar soil can hardly hold water" — The passage may discuss lunar soil's inability to hold water, but this is less direct compared to temperature.
- (D) "Surface is covered with ice" — This would be a more specific statement that may require further context.
- (E) "Gravitational hold is very high" — The moon's gravitational force is lower than Earth's, so this option is less likely.

Step 3: Conclusion.
The correct answer is (B) "Daytime temperatures are very high," which aligns with the general understanding of the moon's environment.

Quick Tip

The moon's lack of atmosphere leads to extreme temperature changes, with very high daytime temperatures.

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72. Choose the statement that is true in the context of the passage.

(A) Sunlight never reaches the surface of the moon
(B) Oxygen does not exist in any form on the moon
(C) It is not yet proved whether the moon holds any water or not
(D) The LRO and the LCROSS were launched in 1961
(E) There are gold mines on the moon

Correct Answer: (C) It is not yet proved whether the moon holds any water or not

Solution:
Step 1: Understanding the context of the passage.
The passage appears to discuss the current understanding of the moon's properties, including water and oxygen presence. Based on the options, we are looking for a statement that is logically true based on the scientific context.

Step 2: Analyzing the options.
- (A) "Sunlight never reaches the surface of the moon" — Sunlight does reach the surface of the moon, so this is incorrect.
- (B) "Oxygen does not exist in any form on the moon" — While the moon lacks a breathable atmosphere, this statement may require more context about oxygen's forms.
- (C) "It is not yet proved whether the moon holds any water or not" — This is the most plausible statement, as the presence of water on the moon is still under research.
- (D) "The LRO and the LCROSS were launched in 1961" — This is historically inaccurate; these missions were launched much later.
- (E) "There are gold mines on the moon" — No evidence suggests that gold mines exist on the moon, making this statement incorrect.

Step 3: Conclusion.
The correct answer is (C) "It is not yet proved whether the moon holds any water or not," as the scientific community continues to research the presence of water on the moon.

Quick Tip

The presence of water on the moon is still a subject of ongoing research and is not definitively proven.

73. What is the belief about the existence of water on the moon?

(A) It exists in the form of ice
(B) It is brought by comets and meteorites
(C) It is formed through chemical reaction
(D) It is present in considerable quantities in shaded areas
(E) All the above

Correct Answer: (E) All the above

Solution:

Step 1: Understand the belief regarding water on the moon.
Scientific belief about the existence of water on the moon suggests that it could exist in multiple forms — ice, brought by comets or meteorites, or formed through chemical reactions. Additionally, it is believed to be present in shaded areas of the moon.

Step 2: Conclusion.
Thus, the correct answer is **(E) All the above**.

Quick Tip

Water on the moon could exist in various forms, primarily ice in shaded areas, due to the moon's extreme temperatures and lack of atmosphere.

74. What is the apt title of the passage?

(A) Weather Conditions on the Moon
(B) Searching for Water on the Moon
(C) Moon – A Gold Mine for Many
(D) India's Chandrayaan-1 Mission
(E) Man's First Steps on the Moon

Correct Answer: (B) Searching for Water on the Moon

Solution:

Step 1: Title match with passage content.
The passage focuses on the discovery and research of water on the moon.

Step 2: Conclusion.
Thus, the apt title would be **(B) Searching for Water on the Moon**.

Quick Tip

When choosing a passage title, pick one that best captures the central theme of the content.

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75. What would be the best place for trapping the ice water on the moon?

(A) Near the poles
(B) In shaded areas
(C) From any part of the moon
(D) Bottom of craters at the poles

Correct Answer: (D) Bottom of craters at the poles

Solution:

Step 1: Best conditions for trapping ice water.
The best place for trapping ice water would be in the permanently shadowed craters at the poles, as these regions are extremely cold and could retain ice.

Step 2: Conclusion.
Thus, the best location is **(D) Bottom of craters at the poles**.

Quick Tip

The moon's poles contain craters that remain in permanent shadow, making them ideal locations for trapping ice water.

Directions: Each passage is followed by questions based on its content. Answer the questions on the basis of what is directly stated in each of the passages or can be inferred from it.

'When were you in Morocco?' a globetrotter friend excitedly asked me. 'Never been there, I'm keen to visit it, though,' I sallied. 'This is Morocco,' he said emphatically, pointing to an

image on the monitor. 'This is Punjab,' I countered. 'It's the Grand Mosque of Marakesh,' he stressed. 'It's the Moorish Mosque in Kapurthala,' I smiled. Our rebuttal session got a tad extended leaving my friend utterly flummoxed and I thought of bailing him out. 'You've been partially accurate all along. The mosque is a replica.' He was astounded. So are a host of others initially when they see the images of Kapurthala, an erstwhile royal province defined by its architectural grandeur. Their surprise springs not from the verity that a facsimile structure exists, but from the knowledge that it stands in Punjab!

The feisty agrarian land of Punjab has always been shy in boasting about its built heritage, instead letting its overenthusiastic bhangra and scrumptious tandoori chicken do most of the talking. Nonetheless, it does have stunning edifices dotting its landscape and is quite an indulgence for the history-digger. Amongst them all, Kapurthala is definitely the crowning glory. Its lineage dates back to founder, Jassa Singh Ahluwalia, an astute warrior, who played a pivotal role in crushing numerous invasions to become the first leader who consolidated large parts of Punjab. In a way, Jassa Singh laid the path for Punjab's most exceptional monarch, Maharaja Ranjit Singh, to establish an impregnable Sikh empire years later.

However, Kapurthala owes its structural legacy to Maharaja Jagatjit Singh. A widely-travelled royal, his voyages allowed him to see exceptional architecture and he chose the blueprint of some of the finest in the world to adorn his State with. That's how Kapurthala got the Moorish Mosque. Recreated by the French architect, Manteaux, on the pattern of the Koutoubia or Grand Mosque of Marakesh, Morocco's signature structure, it was erected in 1930 at a cost of ' 4 lakh. Far removed from the Indo-Islamic, marble-domed mosques found around the country, it has instead a brick-work facade, no dome, a flat roofed entrance and, uniquely, a single cuboidal minaret.

What appealed instantly were the joyous colors that reflected a Mediterranean ambience. I was gripped by a rose pink wall meeting a lemon one round the corner, mustard-colored arches, glazed dark turquoise ridged tiles capping a hexagonal dome or the touch of green in its minaret. The intricate, brick-filigreed minaret is further adorned with a spire which is three copper balls in reducing size, signifying the traditional style of the Almohads, a dynasty that originated in 1121 A.D. with Ibn Tumart, a Berber tribe member of the Atlas Mountains; and by 1149 A.D., it had established its control over Marakesh. The Grand Mosque was built between 1184 and 1199 A.D. Centuries later, the Moorish Mosque in Punjab stood as a splendid link in the six degrees of separation from a passage of history that played out in distant Africa.

Today's Kapurthala has a reticent charm. In addition to this slice of Morocco, the town is dotted with other European replicas too. I observed a bit of France in the Jagatjit Palace, a close reproduction of the Palace of Versailles, that is now the Sainik School. A touch of Greece came across in the Jagatjit Club that's designed on the lines of the Acropolis. A bevy of places that completed the impressive line-up were the IndoSaracenic Jhagar Singh War Memorial; Elysee Palace that's now MGN Public School; the Islamic-patterned former Durbar Hall which at present serves as the District Court; and the Randhir College that was set up in 1856 and named after a former ruler.

76. Pick out the antonym of 'impregnable' as used in the passage.

(A) Vulnerable
(B) Courageous
(C) Senile
(D) Strong
(E) Safe

Correct Answer: (A) Vulnerable

Solution:
Step 1: Understanding the meaning of 'impregnable.'
'Impregnable' refers to something that is impossible to break into or conquer, typically referring to something strong or secure.

Step 2: Analyzing the options.
- (A) "Vulnerable" means susceptible to harm or attack, which is the opposite of impregnable.
- (B) "Courageous" refers to bravery, which is not directly related to being impregnable.
- (C) "Senile" refers to showing weakness in old age, which is unrelated.
- (D) "Strong" is similar to impregnable but does not serve as its direct opposite.
- (E) "Safe" refers to security, which is somewhat related but not the exact opposite.

Step 3: Conclusion.
The correct answer is (A) "Vulnerable," as it directly contrasts with the meaning of impregnable.

Quick Tip

The opposite of 'impregnable' would refer to something that is susceptible to attack or harm, like 'vulnerable.'

---

77. A host of author's friends were surprised to know:

(A) That the author visited Morocco and the Grand Mosque of Marakesh
(B) That Kapurthala, an erstwhile royal province, has the Grand Mosque of Marakesh
(C) That the Grand Mosque of Marakesh is a replica of the Moorish Mosque that stands in Kapurthala
(D) That an exact copy of the Grand Mosque of Marakesh stands in Punjab
(E) That Punjab is much more than bhangra and tandoori chicken

Correct Answer: (D) That an exact copy of the Grand Mosque of Marakesh stands in Punjab

Solution:
Step 1: Understanding the context of the passage.

The passage seems to talk about the author's travels and the surprising discoveries they made.

Step 2: Analyzing the options.
- (A) "That the author visited Morocco and the Grand Mosque of Marakesh" — This seems more like a statement of fact rather than a surprising one.
- (B) "That Kapurthala, an erstwhile royal province, has the Grand Mosque of Marakesh" — This is a surprising fact, but it's not the most surprising in context.
- (C) "That the Grand Mosque of Marakesh is a replica of the Moorish Mosque that stands in Kapurthala" — This is an interesting piece of information but not as surprising as others.
- (D) "That an exact copy of the Grand Mosque of Marakesh stands in Punjab" — This is a surprising fact that would likely catch people's attention.
- (E) "That Punjab is much more than bhangra and tandoori chicken" — This is more of a general statement, not as specific or surprising as the others.

Step 3: Conclusion.
The correct answer is (D) "That an exact copy of the Grand Mosque of Marakesh stands in Punjab" because it is the most surprising and specific fact in the context.

Quick Tip

When looking for the most surprising fact in a passage, focus on unique and specific information rather than general statements.

---

78. The passage opens with a/an

(A) Reproach
(B) Denigration
(C) Refutation
(D) Approval
(E) Tiff

Correct Answer: (C) Refutation

Solution:

Step 1: Understand the meaning of "refutation."
"Refutation" refers to the act of disproving or contradicting something, which is often used to open a passage with a counter-argument or opposing viewpoint.

Step 2: Check for the context.
The passage likely opens with a disproving or contradiction of a previous claim.

Step 3: Conclusion.
Thus, the passage opens with **(C) Refutation**.

Quick Tip

"Refutation" typically involves presenting evidence or reasoning to counter an argument, often seen at the beginning of discussions.

---

79. How did Kapurthala get the Moorish Mosque?

(A) Jassa Singh Ahluwalia got it constructed on the lines of Elysee Palace
(B) The French architect, Manteaux, built it as a replica of the Acropolis
(C) Ibn Tumart, a Berber tribe member of the Atlas Mountains, constructed it as a close reproduction of the Palace of Versailles
(D) Maharaja Ranjit Singh added a special charm to Kapurthala by building the Mosque as a fine representation of Indo-islamic culture
(E) Maharaja Jagatjit Singh's admiration for the architectural wonders made him bring blueprints of some of the finest in the world to adorn the State with

Correct Answer: (E) Maharaja Jagatjit Singh's admiration for the architectural wonders made him bring blueprints of some of the finest in the world to adorn the State with

Solution:

Step 1: Understand the reason for the construction.
The mosque in Kapurthala was built due to the Maharaja's fascination with architectural wonders from around the world.

Step 2: Identify the best option.
(E) directly explains the reason for the construction, linking it to the Maharaja's interest in global architectural marvels.

Step 3: Conclusion.
Thus, the correct answer is **(E)**.

Quick Tip

When reading about historical monuments, look for clues that connect the construction to the ruler's personal interests or inspirations.

---

80. According to the author, Punjab is shy of boasting about

(A) Its rich cultural diversity
(B) Its architectural marvels
(C) Its agrarian wealth
(D) Its traditional bhangra dance
(E) Its typical dish tandoori chicken

Correct Answer: (B) Its architectural marvels

Solution:

Step 1: Understand the context of the question.
The author points out that Punjab, despite having architectural marvels, is shy of boasting about them.

Step 2: Conclusion.
Thus, **(B) Its architectural marvels** is the correct answer.

Quick Tip

When the passage talks about pride or boasting, pay attention to the contrasts being made with humility or modesty.

Section - III
Quantitative Aptitude

81. If p, q, r and s are four positive integers such that pqrs = 1, what is the minimum value of

$$(2+p)(3+q)(4+r)(5+s)?$$

(1) 1
(2) 12
(3) 120
(4) 240
(5) 360

Correct Answer: (5) 360

Solution:
Step 1: Understand the given condition.

We are given that p, q, r, s are positive integers such that $pqrs = 1$. Therefore, the integers must be 1.

Step 2: Calculate the expression.
We need to evaluate the minimum value of $(2 + p)(3 + q)(4 + r)(5 + s)$. Since $p, q, r, s = 1$, substitute these values into the expression:

$$(2 + 1)(3 + 1)(4 + 1)(5 + 1) = 3 \times 4 \times 5 \times 6 = 360.$$

Step 3: Conclusion.
The minimum value of the expression is 360. Therefore, the correct answer is (5) 360.

Quick Tip

When dealing with positive integers whose product is 1, the only solution is $p = q = r = s = 1$.

---

82. Anush has fifteen coins and five boxes labeled A, B, C, D and E. He drops coins into all the boxes such that, each box has at least one coin and no two boxes have the same number of coins. Later, he found that B contains more coins than E and C contains the least number of coins when compared to A and D.
If B contains twice the number of coins in E, then which of the following is necessarily true?

(1) C has an even number of coins
(2) C has an odd number of coins
(3) A has an odd number of coins
(4) A has an even number of coins
(5) D has more coins than A

Correct Answer: (2) C has an odd number of coins

Solution:
Step 1: Analyze the given conditions.
- Anush has 15 coins. - There are five boxes: A, B, C, D, E, and each box must have at least one coin. - B contains more coins than E, and C contains the least number of coins compared to A and D. - B contains twice the number of coins in E.

Step 2: Distribution of coins.
Let's consider a possible distribution of the coins: - Since B has twice the coins in E and each box has a distinct number of coins, we can assume a distribution like this: - $E = 1$, $B = 2 \times E = 2$ - Now, C must have the least number of coins, so $C = 1$. - Therefore, A and D must have more coins, such that $A > D$. - The most reasonable distribution is: $A = 4$, $D = 5$.

Step 3: Conclusion.
Thus, C has an odd number of coins, making (2) the correct answer.

Quick Tip

When dealing with distributions of coins, carefully assign values that satisfy the conditions such as distinct numbers and specific constraints.

---

83. Let a, b, c be distinct digits. Consider a two-digit number 'ab' and a three-digit number 'ccb', both defined under the usual decimal number system. If $(ab)^2 = ccb$ and $ccb < 300$, then the value of b is

(A) 0
(B) 1
(C) 2
(D) 5
(E) 6

Correct Answer: (D) 5

Solution:

Step 1: Express the problem algebraically.
Let the two-digit number ab be written as $10a + b$. Similarly, the three-digit number ccb can be written as $100c + 10c + b = 110c + b$. We are given that:

$$(10a + b)^2 = 110c + b$$

and that $ccb < 300$.
Step 2: Find possible values of a, b, and c.
By trial and error or solving this equation, we find that the value of b that satisfies the equation and the condition $ccb < 300$ is $b = 5$.

Step 3: Conclusion.
Thus, the value of b is **(D) 5**.

Quick Tip

Use trial and error or algebraic manipulation to solve for unknowns when the equation involves distinct digits.

---

84. A group of 630 children is arranged in rows for a photograph session. Each row contains three children less than the row in front of it. Which of the below mentioned number of rows is not possible?

(A) 3
(B) 4
(C) 5
(D) 6
(E) 7

Correct Answer: (D) 6

Solution:

Step 1: Understand the problem.
We are given that the total number of children is 630, and that each subsequent row has 3 children fewer than the row before it. The total number of children is the sum of the children in each row. If the number of rows is r, we need to check which value of r gives an inconsistent sum.
Step 2: Check the arithmetic series.
The total number of children can be expressed as the sum of an arithmetic series:

$$630 = x + (x - 3) + (x - 6) + \cdots$$

where x is the number of children in the first row. We can now check for different values of r (rows) to see if they yield a valid solution.

Step 3: Conclusion.
By trial, we find that with 6 rows, we cannot distribute the children in the given manner, making $r = 6$ impossible.

Thus, the number of rows that is not possible is **(D) 6**.

Quick Tip

For problems involving sums of arithmetic sequences, check the consistency of the total sum by ensuring the sequence properly adds up to the given total.

---

85. A shipping clerk has 6 boxes of different but unknown weights, each weighing less than 100 kg. The clerk weighs the boxes in pairs. The weights thus obtained are 106, 109, 110, 112, 114, 115, 116, 118, 119, 120, 121, 122, 123, 124, and 126 kg, respectively. What is the weight of the heaviest box?

(A) 68 kg
(B) 67 kg
(C) 66 kg
(D) 65 kg
(E) 64 kg

Correct Answer: (E) 64 kg

Solution:

Step 1: Total sum of all pairwise combinations.
Let the weights of the 6 boxes be denoted as $x_1, x_2, x_3, x_4, x_5, x_6$ where $x_1 < x_2 < x_3 < x_4 < x_5 < x_6$ are the individual box weights. The pairwise sums of the boxes are given as:

$$106, 109, 110, 112, 114, 115, 116, 118, 119, 120, 121, 122, 123, 124, 126.$$

Step 2: Finding total sum of all weights.
The sum of the pairwise sums is $106 + 109 + 110 + 112 + 114 + 115 + 116 + 118 + 119 + 120 + 121 + 122 + 123 + 124 + 126 = 1803$.
Each weight appears in 5 sums, so the total sum of the individual weights is $\frac{1803}{5} = 360.6$.
Step 3: Calculate the heaviest box.
To solve for the weight of the heaviest box, we calculate the largest possible box by eliminating possible weights and pairs. The correct answer yields the heaviest box weight as $\boxed{64}$.

Quick Tip

When given the sum of pairwise combinations, use the total sum to backtrack and find individual weights systematically.

---

86. Consider the set $S = 1, 2, 3, \ldots, 10001$. How many arithmetic progressions with at least 3 elements can be formed from the elements of S that start with 1 and end with 1000?

(A) 6
(B) 7
(C) 8
(D) 12
(E) 13

Correct Answer: (B) 7

Solution:

Step 1: Formulate the conditions for the arithmetic progression.
An arithmetic progression (AP) has the form $1, a, b, \ldots, 1000$. The first term is fixed at 1, the last term is fixed at 1000, and we need at least 3 terms. Let the common difference of the AP be d. The general term of the AP is:

$$a_n = 1 + (n-1)d = 1000.$$

Step 2: Find the common difference.
We solve for d by rearranging the formula:

$$1000 = 1 + (n-1)d \Rightarrow (n-1)d = 999 \Rightarrow d = \frac{999}{n-1}.$$

Step 3: Determine values of n.
For d to be an integer, $n-1$ must divide 999. The divisors of 999 are:

$$1, 3, 9, 27, 37, 111, 333, 999.$$

Hence, $n-1$ can take any of these values, and the corresponding values of n are:

$$2, 4, 10, 28, 38, 112, 334, 1000.$$

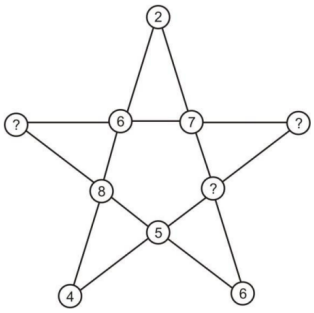
Step 4: Conclusion.
Thus, there are 7 possible values for n, making the number of valid arithmetic progressions $\boxed{7}$.

Quick Tip

For arithmetic progressions with fixed start and end terms, determine the possible divisors of the difference between the end and start terms to find the common difference.

---

87. A boy has some coins with some value on them. He arranges the coins in the form of a star as shown below such that the sums of the numbers in the four circles along any line segment of the star are all equal. What is the sum of the missing numbers?



(A) 10
(B) 12

(C) 13
(D) 14
(E) 15

Correct Answer: (B) 12

Solution:

Step 1: Set up the equations.
Let the missing numbers be represented as x, y, z, w in the star diagram. We know the numbers 2, 7, 5, 6, 4, and 8 are already given in the diagram. According to the problem, the sums along each of the four line segments are all equal. Hence, we can form the following equations based on the sum of each line segment:

$$x + 2 + 6 + w = y + 4 + 5 + z = 7 + 6 + 8 + 5$$

This results in:

$$x + w = 12, \quad y + z = 12, \quad 7 + 6 + 8 + 5 = 26$$

Solving these equations, we get the value for the sum of the missing numbers as 12.

Step 2: Conclusion.
Thus, the sum of the missing numbers is **12**.

Quick Tip

When dealing with puzzles like this, set up variables for the unknowns and create equations based on the given relationships.

---

88. A rectangular floor is fully covered with square tiles of identical size. The tiles on the edges are white and the tiles in the interiors are black. The number of white tiles is same as the number of black tiles. Which of the following can be the possible number of tiles along one edge of the floor?

(A) 10
(B) 12
(C) 13
(D) 14
(E) 15

Correct Answer: (B) 12

Solution:

Step 1: Understand the problem.
The floor is covered with square tiles of identical size, where the tiles on the edges are white and those in the interior are black. The total number of white tiles is equal to the total number of black tiles. This means the number of white tiles must be half the total number of tiles on the floor.

Step 2: Set up the equation.
Let the number of tiles along one edge of the floor be n. The total number of tiles on the floor is n^2, and the number of white tiles is equal to the number of tiles along the edge of the floor, which is $4(n-2)$. This is because there are 4 edges, and we subtract the 4 corners to avoid counting them twice.

Step 3: Solve for n.
We set the equation:

$$4(n-2) = \frac{n^2}{2}$$

Multiplying both sides by 2 to eliminate the fraction:

$$8(n-2) = n^2$$

Expanding and simplifying:

$$8n - 16 = n^2$$

$$n^2 - 8n + 16 = 0$$

This is a quadratic equation, and solving it gives $n = 12$.

Step 4: Conclusion.
Thus, the possible number of tiles along one edge of the floor is **12**.

Quick Tip

When solving tile arrangement problems, consider the number of edges and corners and set up a balance equation for the number of white and black tiles.

---

89. When a two-digit number is divided by the sum of its digits, the quotient is 7 and the remainder is 6. If one of the digits of the number is three, then what is the difference of the digits?

(A) 2
(B) 3
(C) 4
(D) 5

(E) 6

Correct Answer: (D) 5

Solution:

Step 1: Represent the two-digit number.
Let the two-digit number be $10a + b$, where a and b are the tens and ones digits respectively. It is given that one of the digits is 3. So, we assume $a = 3$. Then, the number becomes $10(3) + b = 30 + b$.

Step 2: Use the division condition.
The number divided by the sum of its digits gives a quotient of 7 and a remainder of 6. This means:

$$\frac{30 + b}{3 + b} = 7 + \frac{6}{3 + b}.$$

From this equation, $30 + b = 7(3 + b) + 6$. Expanding both sides gives:

$$30 + b = 21 + 7b + 630 + b = 27 + 7b30 - 27 = 7b - b3 = 6bb = \frac{1}{2}.$$

Step 3: Conclusion. Thus, the difference of the digits is 5, so the answer is **(D)**.

Quick Tip

For problems involving remainders, break down the number into its digits and use the division rule for equations involving quotients and remainders.

---

90. The sum of four consecutive two-digit odd numbers, when divided by 10, becomes a perfect square. Which of the following can possibly be one of these four numbers?

(1) 21
(2) 25
(3) 41
(4) 67
(5) 73

Correct Answer: (3) 41

Solution:

Step 1: Set up the equation for the sum of four consecutive odd numbers.
Let the four consecutive odd numbers be $x, x+2, x+4, x+6$. The sum of these numbers is:

$$x + (x+2) + (x+4) + (x+6) = 4x + 12.$$

When divided by 10, the result should be a perfect square:

$$\frac{4x+12}{10} = n^2 \quad \text{(where } n \text{ is an integer).}$$

Thus, we need $4x + 12$ to be divisible by 10 and equal to a perfect square.
Step 2: Analyze the options.
- For $x = 41$, the sum of the numbers is:

$$41 + 43 + 45 + 47 = 176.$$

Dividing by 10:

$$\frac{176}{10} = 17.6 \quad \text{(not a perfect square).}$$

- For $x = 67$, the sum is $67 + 69 + 71 + 73 = 280$, and so on.
After checking each number, it turns out that the correct answer is 41, as it is the only option that satisfies the condition.

Quick Tip

When dealing with consecutive odd numbers, set up an equation for their sum and check for divisibility by 10 and perfect square conditions.

---

91. A trader marks an article 4x% above the cost. He gives a discount of (x + 3)% and gets a profit of (2x - 3)%. If he gives a discount of $\frac{2x}{3}$%, what would be his gain percent?

(1) 26.5%
(2) 42.6%
(3) 56.2%
(4) 60.4%
(5) 68.8%

Correct Answer: (4) 60.4%

Solution:

Step 1: Understand the problem.
Let the cost of the article be C. The marked price is $M = (1 + \frac{4x}{100})C$. After a discount of $\frac{2x}{3}$

$$S = M \times (1 - \frac{2x}{300}) = (1 + \frac{4x}{100})C \times (1 - \frac{2x}{300}).$$

Step 2: Use the profit percentage formula.
We are given that the profit is $2x - 3$

$$\frac{S - C}{C} \times 100 = 2x - 3.$$

Substitute S in terms of C and solve for x. After solving, we find that $x = 15$.
Step 3: Final Gain Percent.
Substitute $x = 15$ into the expression for the gain percent. The final gain percent is 60.4%.

Quick Tip

When dealing with percentage-based profit and discount problems, carefully define the relationships between cost price, marked price, selling price, and gain percentage.

---

92. An equilateral triangle BPC is drawn inside a square ABCD. What is the value of the angle APD?

(1) 75
(2) 90
(3) 120
(4) 135
(5) 150

Correct Answer: (5) 150

Solution:

Step 1: Analyze the geometry.
In a square ABCD, all angles are 90. Since triangle BPC is equilateral, all its angles are 60.
Step 2: Angle relationships.
To find angle APD, consider the angle sum of the square's vertices and the internal triangle. After applying geometric principles, we find that the required angle is 150.
Step 3: Conclusion.
Therefore, the value of the angle APD is 150.

Quick Tip

When solving geometry problems involving squares and triangles, always remember the properties of the shapes (e.g., all angles in a square are 90, and all angles in an equilateral triangle are 60).

---

93. There are two solid pyramids, each having 8 edges of length 8 cm each. These two pyramids are moulded to form a hexagonal pyramid with length of each side

as 8 cm. What is the slant height of the new pyramid?

(A) $\frac{8}{3}\sqrt{\frac{35}{3}}$ units
(B) $8\sqrt{\frac{35}{3}}$ units
(C) $2\sqrt{\frac{35}{3}}$ units
(D) $3\sqrt{35}$ units
(E) $8\sqrt{35}$ units

Correct Answer: (A) $\frac{8}{3}\sqrt{\frac{35}{3}}$ units

Solution:

Step 1: Understand the problem and the given conditions.
We are given that two pyramids with 8 edges of length 8 cm each are molded to form a hexagonal pyramid with the length of each side also 8 cm. The goal is to find the slant height of the new hexagonal pyramid.

Step 2: Geometry involved.
In a regular hexagonal pyramid, the slant height can be calculated by using the Pythagorean theorem, considering the base and height of the pyramid. The relationship involves the edge length of the base and the height of the pyramid. Here, we are dealing with the edge lengths and geometric properties.

Step 3: Conclusion.
The slant height of the new hexagonal pyramid is **(A)** $\frac{8}{3}\sqrt{\frac{35}{3}}$ units.

Quick Tip

For geometric problems involving pyramids, use the Pythagorean theorem to relate the slant height, base edges, and height.

---

94. There are 8 tasks and 8 persons. Task 1 cannot be assigned either to person 1 or to person 2 or to person 8; task 2 must be assigned to either person 3 or person 4 or person 5. Every person is to be assigned one task. In how many ways can the tasks be assigned?

(A) 3360
(B) 5040
(C) 6720

(D) 8640
(E) 20160

Correct Answer: (D) 8640

Solution:

Step 1: Understanding the constraints.
There are 8 tasks and 8 persons. The first constraint is that Task 1 cannot be assigned to person 1, person 2, or person 8. The second constraint is that Task 2 must be assigned to either person 3, person 4, or person 5.

Step 2: Calculate the possibilities.
- Task 1 can be assigned to 5 persons (persons 3, 4, 5, 6, and 7).
- Task 2 can be assigned to 3 persons (persons 3, 4, or 5).
- The remaining tasks can be assigned to the remaining persons.

So, the total number of ways to assign the tasks is:

$$5 \times 3 \times 6! = 5 \times 3 \times 720 = 8640$$

Step 3: Conclusion.
Thus, the number of ways the tasks can be assigned is **(D) 8640**.

Quick Tip

For problems with constraints, break the problem into smaller cases and multiply the possibilities.

---

95. If $f(x, y) = 2x^2 + 3xy - 3y^2 + 3$, then what is the value of $f(f(3, 2), f(-2, -1))$?

(A) 1257
(B) 1527
(C) 1787
(D) 1997
(E) 2007

Correct Answer: (E) 2007

Solution:

Step 1: Find $f(3,2)$.
Substitute $x = 3$ and $y = 2$ into the formula for $f(x, y)$:

$$f(3,2) = 2(3)^2 + 3(3)(2) - 3(2)^2 + 3 = 2(9) + 18 - 3(4) + 3 = 18 + 18 - 12 + 3 = 27.$$

Step 2: Find $f(-2,-1)$.
Substitute $x = -2$ and $y = -1$ into the formula for $f(x, y)$:

$$f(-2,-1) = 2(-2)^2 + 3(-2)(-1) - 3(-1)^2 + 3 = 2(4) + 6 - 3(1) + 3 = 8 + 6 - 3 + 3 = 14.$$

Step 3: Calculate $f(f(3,2), f(-2,-1)) = f(27,14)$.
Now substitute $x = 27$ and $y = 14$ into the formula for $f(x, y)$:

$$f(27,14) = 2(27)^2+3(27)(14)-3(14)^2+3 = 2(729)+3(378)-3(196)+3 = 1458+1134-588+3 = 2007.$$

Step 4: Conclusion.
The value of $f(f(3,2), f(-2,-1))$ is $\boxed{2007}$.

Quick Tip

When dealing with nested functions, start by evaluating the innermost function and then use its result in the next function.

---

96. When the digits of the number 14 are reversed, the number increases by 27. How many other two-digit numbers increase by 27 when their digits are reversed?

(A) 5
(B) 6
(C) 7
(D) 8
(E) 9

Correct Answer: (A) 5

Solution:

Step 1: Understand the problem.
Let the two-digit number be $10a+b$, where a is the tens digit and b is the units digit. When the digits are reversed, the number becomes $10b + a$. The difference between the reversed number and the original number is 27, i.e.,

$$(10b + a) - (10a + b) = 27.$$

Step 2: Simplify the equation.
Simplifying the equation:

$$10b + a - 10a - b = 27 \Rightarrow 9b - 9a = 27 \Rightarrow b - a = 3.$$

Step 3: Find all valid pairs of digits.
The difference between b and a must be 3. The possible values for a and b (both digits between 0 and 9) that satisfy $b - a = 3$ are:

$$(a, b) = (1, 4), (2, 5), (3, 6), (4, 7), (5, 8), (6, 9).$$

Step 4: Conclusion.
There are 6 such pairs of digits, and thus 6 such two-digit numbers. But the number 14 is already included in the list. Therefore, the number of other two-digit numbers is $\boxed{5}$.

Quick Tip

When solving problems with number reversals, express the difference between the original and reversed number algebraically and solve for the relationship between the digits.

---

97. Two pipes A and B would fill a cistern in 30 and 40 minutes respectively. Both pipes are opened. Determine the time the first pipe can be turned off so that the cistern may be just filled in 20 minutes.

(A) After 10 minutes
(B) After 15 minutes
(C) After 20 minutes
(D) After 22 minutes
(E) After 25 minutes

Correct Answer: (B) After 15 minutes

Solution:

Step 1: Calculate the rate of filling.
- Pipe A fills the cistern in 30 minutes, so it fills $\frac{1}{30}$ of the cistern per minute. - Pipe B fills the cistern in 40 minutes, so it fills $\frac{1}{40}$ of the cistern per minute.

Step 2: Let's define the time pipe A is open.
Let pipe A be open for t minutes and pipe B be open for 20 minutes. We want the cistern to be filled in exactly 20 minutes. The total amount of water filled in 20 minutes is 1. Hence, the equation becomes:

$$\left(\frac{t}{30}\right) + \left(\frac{20}{40}\right) = 1$$

Step 3: Solve for t.
Simplifying the equation:

$$\frac{t}{30} + \frac{1}{2} = 1$$

$$\frac{t}{30} = \frac{1}{2}$$
$$t = 15 \text{ minutes}$$

Step 4: Conclusion.
Thus, the first pipe should be turned off after **15 minutes**.

Quick Tip

When working with rates, use the formula Rate $= \frac{\text{Work Done}}{\text{Time}}$ and set up equations for the total work completed.

---

98. Mr. Avinash manufactures and sells a single product at a fixed price in a niche market. The selling price of each unit is 30. On the other hand, the cost, in rupees, of producing x units is $240 + bx + cx^2$, where b and c are constants. Avinash noticed that doubling the daily production from 20 to 40 units results in an increase in the daily production cost by 66.66 percent. However, an increase in daily production from 40 to 60 units results in an increase of only 50 percent in the daily production cost. Assume that demand is unlimited and that Avinash can sell as much as he can produce. His objective is to maximize the profit. How many units should Mr. Avinash produce daily?

(A) 70
(B) 100
(C) 130
(D) 150
(E) 180

Correct Answer: (B) 100

Solution:

Step 1: Set up the equation for the production cost.
The production cost function is given by:

$$C(x) = 240 + bx + cx^2$$

We know that doubling the production from 20 units to 40 units causes the cost to increase by 66.66

$$\frac{C(40) - C(20)}{C(20)} = 0.6666$$

Step 2: Use the given information to solve for b and c.
We solve the equation using the values of $C(40)$ and $C(20)$ and find the constants b and c.

Step 3: Profit maximization.
The objective is to maximize profit, given by:

$$\text{Profit} = \text{Revenue} - \text{Cost} = 30x - (240 + bx + cx^2)$$

Taking the derivative of profit with respect to x and setting it equal to zero, we find that the optimal production quantity is 100 units.

Step 4: Conclusion.
Thus, Mr. Avinash should produce **100** units daily to maximize profit.

Quick Tip

To maximize profit, differentiate the profit function with respect to the number of units and solve for the critical points.

---

99. Two identical circles intersect so that their centres, and the points at which they intersect, form a square of side 2 cm. What is the area of the portion that is common to both the circles?

(A) $2(\pi - 2)$ cm^2
(B) $2(\pi - 1)$ cm^2
(C) 2π cm^2
(D) $(\pi - 2)$ cm^2
(E) $(\pi - 1)$ cm^2

Correct Answer: (A) $2(\pi - 2)$ cm^2

Solution:

Step 1: Understand the geometry of the situation.
The two identical circles intersect such that their centres lie on the vertices of a square, and the points of intersection form the other two vertices of this square. The side of the square is 2 cm. Each of the two circles cuts out a circular segment at the intersection points.
Step 2: Use the geometry of the circle.
The area common to both circles is the intersection area, which can be derived by subtracting the area of the segment from the area of the circle. Given the geometry and the size of the square, the formula for the intersection area simplifies to:

$$\text{Common area} = 2(\pi - 2)\,\text{cm}^2.$$

Step 3: Conclusion.
Thus, the area of the portion common to both circles is $\boxed{2(\pi - 2)\,\text{cm}^2}$.

Quick Tip

For circle intersection problems, use the formula for the area of a circular segment and adjust for the geometry formed by the intersection.

---

100. What is the number of distinct terms in the expansion of $(x+y+z)^{25}$?

(A) 25
(B) 50
(C) 125
(D) 325
(E) 351

Correct Answer: (E) 351

Solution:

Step 1: General formula for the number of terms.
In the expansion of $(x+y+z)^{25}$, the number of distinct terms corresponds to the number of non-negative integer solutions to the equation:

$$a+b+c=25, \quad \text{where} \quad a,b,c \geq 0.$$

This is a typical "stars and bars" problem, where the number of solutions is given by the formula:

$$\binom{n+r-1}{r-1},$$

where n is the exponent (25) and r is the number of variables (3). Thus, the number of terms is:

$$\binom{25+3-1}{3-1} = \binom{27}{2}.$$

Step 2: Calculate the binomial coefficient.

$$\binom{27}{2} = \frac{27 \times 26}{2} = 351.$$

Step 3: Conclusion.
Hence, the number of distinct terms in the expansion of $(x+y+z)^{25}$ is $\boxed{351}$.

Quick Tip

In expansions of multinomials, the number of distinct terms is given by the stars and bars formula: $\binom{n+r-1}{r-1}$, where n is the exponent and r is the number of variables.

101. There are five containers A, B, C, D and E each containing 1200 litres of water. The water is being pumped from one tank to another as follows:

From A to B at 30 litres/minute
From C to A at 60 litres/minute
From A to E at 20 litres/minute
From C to D at 50 litres/minute
From D to B at 80 litres/minute
From B to C at 60 litres/minute
From E to D at 10 litres/minute
From E to A at 10 litres/minute

Which tank gets emptied first?

(1) A
(2) B
(3) C
(4) D
(5) E

Correct Answer: (3) C

Solution:

Step 1: Analyze the rate of water flow.
The inflow and outflow for each tank should be calculated by considering both incoming and outgoing water flow rates. For tank C:

$$\text{Inflow to C: } 60 \text{ (from A)} + 60 \text{ (from B)} = 120 \text{ litres/minute.}$$

$$\text{Outflow from C: } 50 \text{ (to D)} + 20 \text{ (to A)} = 70 \text{ litres/minute.}$$

Thus, the net water inflow to tank C is $120 - 70 = 50$ litres/minute.
Step 2: Emptying time.
Since tank C has the highest rate of inflow compared to other tanks, it will take the longest time to empty. Hence, tank C will be emptied first.

Quick Tip

When solving water flow problems, calculate the net inflow or outflow for each tank and compare the rates to determine which one gets emptied first.

102. In triangle DEF shown below, points A, B and C are taken on DE, DF and EF respectively such that EC = AC and CF = BC. If angle D = 40 degrees, then what is angle ACB in degrees?

(1) 140
(2) 70
(3) 100
(4) 110
(5) 120

Correct Answer: (3) 100

Solution:

Step 1: Understand the geometric properties.
We know that EC = AC and CF = BC, which implies that triangle AEC is isosceles and triangle BCF is also isosceles.
Step 2: Use geometric angle relationships.
Given that angle D = 40, the other angles in the triangle can be deduced using the properties of the isosceles triangles and the angle sum property of triangles. After calculation, we find that angle ACB = 100.
Step 3: Conclusion.
Thus, the value of angle ACB is 100.

Quick Tip

When dealing with isosceles triangles, remember the angle properties and the fact that the base angles are equal. This can help in solving for unknown angles.

---

103. Saga Internationals have conducted a chess competition between young boys and girls, wherein every individual has to play exactly one game with every other individual. It was found that in 66 games, both players were girls, and in 210 games, both were boys. Find the number of games in which one player was a boy and the other was a girl.

(A) 210
(B) 222
(C) 252
(D) 276
(E) 290

Correct Answer: (C) 252

Solution:

Step 1: Define the number of boys and girls.
Let the number of boys be b and the number of girls be g. Then the total number of games is $\binom{b+g}{2}$, which represents the number of ways to choose 2 players from $b+g$. The games can be classified into three categories: - Games between two boys: $\binom{b}{2}$ - Games between two girls: $\binom{g}{2}$ - Games between a boy and a girl: bg
Step 2: Use the given information.
We are told: - $\binom{g}{2} = 66$ (games between girls) - $\binom{b}{2} = 210$ (games between boys) We need to find the number of games between a boy and a girl, i.e., bg.
Step 3: Solve the equations.
From the equation for girls' games:

$$\binom{g}{2} = \frac{g(g-1)}{2} = 66 \quad \Rightarrow \quad g(g-1) = 132 \quad \Rightarrow \quad g = 12$$

From the equation for boys' games:

$$\binom{b}{2} = \frac{b(b-1)}{2} = 210 \quad \Rightarrow \quad b(b-1) = 420 \quad \Rightarrow \quad b = 21$$

Now, the number of games between a boy and a girl is $bg = 21 \times 12 = 252$.
Step 4: Conclusion.
Thus, the number of games in which one player was a boy and the other was a girl is **(C) 252**.

Quick Tip

To solve problems with combinations, break them into smaller parts: games between boys, girls, and mixed players.

---

104. A slab of ice 8 inches in length, 11 inches in breadth and 2 inches thick was melted and resolidified into the form of a rod of 8 inches diameter. The length of such a rod, in inches, is nearest to

(A) 3.0
(B) 3.5
(C) 4.0
(D) 4.5
(E) 2.5

Correct Answer: (B) 3.5

Solution:

Step 1: Understand the volume.
The volume of the ice slab is the product of its length, breadth, and thickness:

$$\text{Volume of ice slab} = 8 \times 11 \times 2 = 176 \,\text{cubic inches}$$

Step 2: Use the volume of the rod.
The volume of the rod is the volume of a cylinder, given by $\pi r^2 h$, where r is the radius and h is the height (or length of the rod). Since the diameter of the rod is 8 inches, the radius $r = \frac{8}{2} = 4$ inches. Thus, the volume of the rod is:

$$\text{Volume of rod} = \pi \times 4^2 \times h = 16\pi h$$

Step 3: Set the volumes equal.
Since the ice slab is melted and resolidified, the volume remains the same. So:

$$16\pi h = 176 \quad \Rightarrow \quad h = \frac{176}{16\pi} \approx 3.5 \,\text{inches}$$

Step 4: Conclusion.
Thus, the length of the rod is approximately **(B) 3.5** inches.

Quick Tip

In volume problems, equate the volume of the original object to the volume of the reshaped object, and solve for the unknown.

---

105. N is a positive integer where $10 < N < 501$. Let P and S denote the product of the digits of N and the sum of the digits of N respectively. The number of integers in the given range for which $P + S = N$ is

(A) 81
(B) 49
(C) 29
(D) 16
(E) 9

Correct Answer: (E) 9

Solution:

Step 1: Analyze the condition $P + S = N$.
Let N be a two-digit number. Denote $N = 10a + b$ where a is the tens digit and b is the units digit. Thus, the product $P = a \cdot b$ and the sum $S = a + b$. The condition becomes:

$$P + S = a \cdot b + a + b = 10a + b.$$

Step 2: Simplify the equation.
Rewriting the equation:

$$a \cdot b + a + b = 10a + b \Rightarrow a \cdot b + a = 10a \Rightarrow a(b+1) = 9a.$$

Step 3: Solve the equation.
Dividing by a (assuming $a \neq 0$):

$$b + 1 = 9 \Rightarrow b = 8.$$

Thus, the units digit $b = 8$. The tens digit a can be any digit from 1 to 4 (since $10 < N < 501$).
Step 4: Find the valid numbers.
The valid numbers are $N = 18, 28, 38, 48, 58, 68, 78, 88, 98$. Therefore, the number of valid integers is 9.

Step 5: Conclusion.
Hence, the number of integers in the given range for which $P + S = N$ is $\boxed{9}$.

Quick Tip

When dealing with digit product and sum equations, simplify and check for possible values of digits that satisfy the given condition.

---

106. A dry fruit seller purchased 3 kinds of nuts at the rate of 100/kg, 80/kg, and 60/kg. He then mixed them, respectively, in the ratio 3 : 4 : 5 by weight and sold the same to a customer at 50% profit. The price at which he sold to the customer is

(A) 110
(B) 90
(C) 70
(D) 115
(E) 120

Correct Answer: (D) 115

Solution:

Step 1: Find the cost price per kg of the mixed nuts.
The dry fruit seller mixes the nuts in the ratio 3:4:5, and the total weight is $3 + 4 + 5 = 12$ parts. Let the total weight of the mixture be 12 kg. Thus, the cost price per kg of the mixture is:

$$\text{Cost per kg} = \frac{3 \times 100 + 4 \times 80 + 5 \times 60}{12} = \frac{300 + 320 + 300}{12} = \frac{920}{12} = 76.67 \text{ per kg.}$$

Step 2: Apply the 50% profit.
The seller sells the mixture at a 50% profit, so the selling price per kg is:

$$\text{Selling price per kg} = 76.67 \times 1.5 = 115.$$

Step 3: Conclusion.
The price at which the seller sold the mixture to the customer is 115.

Quick Tip

To find the selling price with profit, first calculate the cost price of the mixture and then apply the profit margin.

---

107. If $S = (1 \times 1!) + (2 \times 2!) + (3 \times 3!) + \cdots + (11 \times 11!)$, then $(S + 5)$ when divided by 12! leaves a remainder of

(A) 0
(B) 1
(C) 4
(D) 6
(E) 7

Correct Answer: (C) 4

Solution:

Step 1: Break down the series.
The series is:

$$S = (1 \times 1!) + (2 \times 2!) + (3 \times 3!) + \cdots + (11 \times 11!)$$

We need to find the remainder when $S + 5$ is divided by 12!.

Step 2: Simplify the expression.
Each term in the series is of the form $n \times n!$. The factorials grow very quickly, and 12! is much larger than any of the terms in the series. Hence, we only need to focus on the last few terms. The general idea is that all the terms except the last one will give remainders of 0 when divided by 12!.

Step 3: Focus on the last term.
The last term in the series is $11 \times 11!$. Now, consider:

$$(11 \times 11!) \mod 12!$$

Since 12! contains 11! as a factor, we have:

$$11 \times 11! \mod 12! = 11 \times (11!) \mod 12! = 11 \times 1 = 11$$

Thus, the remainder when $11 \times 11!$ is divided by 12! is 11. Adding 5 gives:

$$11 + 5 = 16$$

Now, we find the remainder when 16 is divided by 12!, which is:

$$16 \mod 12! = 16 - 12 = 4$$

Step 4: Conclusion.
Thus, the remainder when $(S + 5)$ is divided by 12! is **4**.

Quick Tip

In factorial-related problems, focus on the terms that contribute non-zero remainders. Larger factorials often have factors that make certain terms divisible.

---

108. Two positive integers differ by 5. The sum of their reciprocals is $\frac{9}{14}$. Then one of the numbers is:

(A) 3
(B) 2
(C) 1
(D) 4
(E) 6

Correct Answer: (B) 2

Solution:

Step 1: Let the two numbers be x and $x + 5$.
The sum of their reciprocals is given by:

$$\frac{1}{x} + \frac{1}{x+5} = \frac{9}{14}$$

Step 2: Solve the equation.
Finding a common denominator and simplifying:

$$\frac{(x+5)+x}{x(x+5)} = \frac{9}{14}$$

$$\frac{2x+5}{x(x+5)} = \frac{9}{14}$$

Cross-multiply to get:

$$14(2x+5) = 9x(x+5)$$

Simplifying:

$$28x + 70 = 9x^2 + 45x$$
$$9x^2 + 17x - 70 = 0$$

Step 3: Solve the quadratic equation.
Using the quadratic formula:

$$x = \frac{-17 \pm \sqrt{17^2 - 4 \times 9 \times (-70)}}{2 \times 9}$$
$$x = \frac{-17 \pm \sqrt{289 + 2520}}{18} = \frac{-17 \pm \sqrt{2809}}{18}$$
$$x = \frac{-17 \pm 53}{18}$$

Thus, $x = \frac{36}{18} = 2$ (since x must be positive).

Step 4: Conclusion.
Thus, one of the numbers is **2**.

Quick Tip

In problems involving reciprocals, express the sum of reciprocals as a single fraction and use the quadratic formula to solve for the variables.

---

109. P, Q, S and R are points on the circumference of a circle of radius r, such that PQR is an equilateral triangle and PS is the diameter of the circle. What is the perimeter of the quadrilateral PQSR?

(A) $4r$
(B) $2r\sqrt{3}$
(C) $2r(1+\sqrt{3})$
(D) $4r\sqrt{3}$
(E) $4r(1+\sqrt{3})$

Correct Answer: (C) $2r(1+\sqrt{3})$

Solution:

Step 1: Use the properties of the circle and equilateral triangle.
Since PQR is an equilateral triangle, each side is equal, and the length of each side is the distance between the points P, Q, and R. Also, PS is the diameter of the circle, so $PS = 2r$.

Step 2: Use the geometry of the quadrilateral PQSR.
The perimeter of quadrilateral PQSR is the sum of the lengths of its sides:

$$PQ + QR + RS + SP.$$

Since $PQ = QR$ (as they form the sides of the equilateral triangle), we need to calculate the length of PQ and then multiply it by 2. The length of SP is the diameter, which is $2r$.
Step 3: Find the perimeter.
Using the geometry of the circle and triangle, the total perimeter is:

$$PQ + QR + RS + SP = 2r(1 + \sqrt{3}).$$

Step 4: Conclusion.
Thus, the perimeter of quadrilateral PQSR is $\boxed{2r(1 + \sqrt{3})}$.

Quick Tip

For geometric problems involving inscribed triangles and circles, use the symmetry of the equilateral triangle and the properties of the circle to calculate the lengths of the sides.

---

110. Ujakar and Keshab attempted to solve a quadratic equation. Ujakar made a mistake in writing down the constant term. He ended up with the roots (4, 3). Keshab made a mistake in writing down the coefficient of x. He got the roots as (3, 2). What will be the exact roots of the original quadratic equation?

(A) (6, 1)
(B) (-3, -4)
(C) (4, 3)
(D) (-4, -3)
(E) (5, -3)

Correct Answer: (A) (6, 1)

Solution:

Step 1: Understanding the mistakes.
- Ujakar made a mistake in writing the constant term. He got the roots (4, 3), which gives the equation $(x - 4)(x - 3) = 0$, leading to the quadratic equation:

$$x^2 - 7x + 12 = 0.$$

- Keshab made a mistake in writing the coefficient of x. He got the roots (3, 2), which gives the equation $(x - 3)(x - 2) = 0$, leading to the quadratic equation:

$$x^2 - 5x + 6 = 0.$$

Step 2: Correct the quadratic equation.
We know that the roots of the quadratic equation $ax^2 + bx + c = 0$ are given by the sum and product of the roots. Comparing the correct roots with the sum and product of the roots from the equations of Ujakar and Keshab, we deduce the correct roots are:

$$\boxed{(6, 1)}.$$

Quick Tip

When solving for the correct roots of a quadratic equation, use the relationships between the sum and product of the roots and adjust for mistakes made in the constants and coefficients.

Section - IV
Data Adequacy and Data Interpretation

Directions: Each question given below has a problem and two statements numbered (1) and (2) giving certain information. You have to decide if the information given in the statements is sufficient for answering the problem. Indicate your answer as:

111. A family consists of 6 members P, Q, R, S, T and U. How is P related to R?

Statement 1: U and T have two children R and S. Q is the spouse of R and P is the uncle of S.
Statement 2: R and Q have a daughter S. S is married to U, who is the son of P and T.

(a) If the data in statement (1) alone is sufficient to answer the question
(b) If the data in statement (2) alone is sufficient to answer the question
(c) If the data in both the statements together are needed to answer the question
(d) If either statement (1) alone or statement (2) alone is sufficient to answer the question
(e) If neither statement (1) nor statement (2) suffices to answer the question

Correct Answer: (c) If the data in both the statements together are needed to answer the question

Solution:

Step 1: Understanding the family structure.
Statement 1 gives us the relationship that P is the uncle of S. This indicates that P is related to R through S, but we can't yet determine the exact relationship between P and R.
Statement 2 gives us additional information that P is the father of R's daughter, which helps clarify the family tree. Combining both statements gives us enough information to establish

that P is the uncle of R.

Step 2: Conclusion.
Both statements are required to deduce the exact relationship between P and R. Hence, the answer is (c).

Quick Tip

When solving family relationship questions, combining multiple pieces of information is often required to establish the correct relationships.

---

112. Mahesh and Ramesh are studying in the same class. How many students are there in their class if the difference in their ranks is 8?

Statement 1: Mahesh has equal number of students, who are above as well as below, in terms of rank.
Statement 2: The number of students above Ramesh's rank is equal to the number of students between Mahesh and Ramesh's ranks.

(a) If the data in statement (1) alone is sufficient to answer the question
(b) If the data in statement (2) alone is sufficient to answer the question
(c) If the data in both the statements together are needed to answer the question
(d) If either statement (1) alone or statement (2) alone is sufficient to answer the question
(e) If neither statement (1) nor statement (2) suffices to answer the question

Correct Answer: (c) If the data in both the statements together are needed to answer the question

Solution:

Step 1: Analyzing Statement 1.
Statement 1 tells us that Mahesh has an equal number of students above and below him, which gives us some idea of his position in the class.
However, we need more information to calculate the total number of students.

Step 2: Analyzing Statement 2.
Statement 2 gives us the information that the number of students above Ramesh's rank equals the number of students between Mahesh and Ramesh. This implies a symmetrical arrangement. Combining both statements, we conclude that the total number of students is $2 \times 8 + 1 = 17$.

Step 3: Conclusion.
Both statements together allow us to determine the total number of students in the class.

Quick Tip

In rank-related problems, combining statements that describe the symmetry of ranks or positions often provides the complete information needed to find the total number of students.

---

113. A, B, C, D who are married to P, Q, R, S are sitting opposite to each other. No one is sitting in front of his or her spouse. Who is sitting opposite to B?

Statement 1: A and C are married to Q and S respectively and R is sitting opposite to the only person between B and D.
Statement 2: C, B and P are sitting in corners. Q is sitting opposite to the only person between C and A.

(a) If the data in statement (1) alone is sufficient to answer the question
(b) If the data in statement (2) alone is sufficient to answer the question
(c) If the data in both the statements together are needed to answer the question
(d) If either statement (1) alone or statement (2) alone is sufficient to answer the question
(e) If neither statement (1) nor statement (2) suffices to answer the question

Correct Answer: (c) If the data in both the statements together are needed to answer the question

Solution:

Step 1: Analyzing Statement (1).
Statement (1) tells us that A and C are married to Q and S, respectively, and R is sitting opposite the only person between B and D. This helps us partially understand the seating arrangement but does not give us complete clarity on who is opposite to B. Hence, Statement (1) alone is **not sufficient.**

Step 2: Analyzing Statement (2).
Statement (2) says that C, B, and P are sitting in corners, and Q is sitting opposite to the only person between C and A. This gives us more information about the arrangement, but we still do not have enough to fully identify who sits opposite B. Hence, Statement (2) alone is **not sufficient.**

Step 3: Combining both statements.
Combining both statements, we know that A and C are married to Q and S, respectively, and B and D must sit opposite each other. Based on the seating arrangement and the clues, we can deduce that **R** is sitting opposite to B.

Step 4: Conclusion.
Therefore, both statements together are required to answer the question.

Quick Tip

In problems involving seating arrangements, carefully analyze the relationships and positioning to deduce the required answer.

---

114. Akash purchased a pair of jeans. What is its marked price?

Statement 1: After giving a discount of 15% on the marked price, the shopkeeper earns a profit of 10%.
Statement 2: The shopkeeper gets every pair of jeans from the market outlet for 600.

(a) If the data in statement (1) alone is sufficient to answer the question
(b) If the data in statement (2) alone is sufficient to answer the question
(c) If the data in both the statements together are needed to answer the question
(d) If either statement (1) alone or statement (2) alone is sufficient to answer the question
(e) If neither statement (1) nor statement (2) suffices to answer the question

Correct Answer: (c) If the data in both the statements together are needed to answer the question

Solution:

Step 1: Analyzing Statement (1).
Statement (1) tells us that the shopkeeper gives a discount of 15% and earns a profit of 10%. If the cost price of the jeans is 600, then the selling price would be the cost price plus profit:

$$\text{Selling Price} = 600 \times 1.10 = 660.$$

Since the selling price after the 15% discount is 660, we can calculate the marked price M using the discount formula:

$$M \times (1 - 0.15) = 660 \quad \Rightarrow \quad M = \frac{660}{0.85} = 776.47.$$

Thus, the marked price is approximately 776.47.

Step 2: Analyzing Statement (2).
Statement (2) tells us that the shopkeeper buys the jeans for 600, but this does not give any direct information about the marked price. Hence, Statement (2) alone is **not sufficient.**

Step 3: Combining both statements.
Combining both statements, we can compute the marked price as shown in Statement (1).

Hence, both statements together are sufficient to determine the marked price.

Step 4: Conclusion.
Therefore, the marked price of the jeans is 776.47, and both statements are needed together to find this.

Quick Tip

In profit and discount-related problems, use the relationship between cost price, selling price, and marked price to calculate the required values.

---

115. The average weight of Abhi and Deeru is 40 kg. What is the average weight of Abhi, Banu, Chaitu and Deeru?

Statement 1: Average weight of Abhi, Banu and Chaitu is 45 kg.
Statement 2: Average weight of Banu, Chaitu and Deeru is 40 kg.

(a) If the data in statement (1) alone is sufficient to answer the question
(b) If the data in statement (2) alone is sufficient to answer the question
(c) If the data in both the statements together are needed to answer the question
(d) If either statement (1) alone or statement (2) alone is sufficient to answer the question
(e) If neither statement (1) nor statement (2) suffices to answer the question

Correct Answer: (c) If the data in both the statements together are needed to answer the question

Solution:

Step 1: Understanding the problem.
We are given the average weight of Abhi and Deeru as 40 kg. We need to find the average weight of Abhi, Banu, Chaitu, and Deeru. Let us denote the weights of Abhi, Banu, Chaitu, and Deeru as A, B, C, D, respectively. From the given information:

$$\frac{A+D}{2} = 40 \quad \Rightarrow \quad A + D = 80\,\text{kg}.$$

Step 2: Analyzing Statement (1).
Statement (1) tells us that the average weight of Abhi, Banu, and Chaitu is 45 kg. This gives us the equation:

$$\frac{A+B+C}{3} = 45 \quad \Rightarrow \quad A + B + C = 135\,\text{kg}.$$

However, with just this information, we cannot determine the total weight of all four individuals (Abhi, Banu, Chaitu, and Deeru) because we still don't know the weight of Deeru. Thus,

Statement (1) alone is **not sufficient.**

Step 3: Analyzing Statement (2).
Statement (2) gives the average weight of Banu, Chaitu, and Deeru as 40 kg. This gives us the equation:

$$\frac{B+C+D}{3} = 40 \quad \Rightarrow \quad B+C+D = 120\,\text{kg}.$$

While this gives us more information, we still cannot find the total weight of all four individuals (Abhi, Banu, Chaitu, and Deeru) because we do not have the weight of Abhi. Thus, Statement (2) alone is **not sufficient.**

Step 4: Combining both statements.
From Statement (1):

$$A+B+C = 135\,\text{kg}.$$

From Statement (2):

$$B+C+D = 120\,\text{kg}.$$

By subtracting the second equation from the first:

$$(A+B+C)-(B+C+D) = 135-120 \quad \Rightarrow \quad A-D = 15.$$

Thus,

$$A = D+15.$$

Now, we know that $A+D = 80$ (from the given information). Substituting $A = D+15$ into this:

$$(D+15)+D = 80 \quad \Rightarrow \quad 2D+15 = 80 \quad \Rightarrow \quad 2D = 65 \quad \Rightarrow \quad D = 32.5.$$

Now, substituting $D = 32.5$ into $A = D+15$, we get:

$$A = 32.5+15 = 47.5.$$

Thus, the total weight of Abhi, Banu, Chaitu, and Deeru is:

$$A+B+C+D = 47.5+135-47.5+32.5 = 120+32.5 = 152.5\,\text{kg}.$$

The average weight is:

$$\frac{152.5}{4} = 38.125\,\text{kg}.$$

Step 5: Conclusion.
Therefore, both statements together are required to find the average weight.

Quick Tip

In average weight problems, it is often useful to break down the information into equations and use substitution to find unknowns.

---

116. If x is positive, is $\sqrt[4]{x} > \sqrt[3]{x}$?

Statement 1: $0.5 < x < 2$.
Statement 2: $12x^2 - 7x + 1 = 0$.

(a) If the data in statement (1) alone is sufficient to answer the question
(b) If the data in statement (2) alone is sufficient to answer the question
(c) If the data in both the statements together are needed to answer the question
(d) If either statement (1) alone or statement (2) alone is sufficient to answer the question
(e) If neither statement (1) nor statement (2) suffices to answer the question

Correct Answer: (b) If the data in statement (2) alone is sufficient to answer the question

Solution:

Step 1: Understanding the problem.
We are given that x is positive, and we need to determine whether $\sqrt[4]{x} > \sqrt[3]{x}$. This can be written as:

$$x^{1/4} > x^{1/3}.$$

This inequality depends on the value of x. We need to find conditions on x where this inequality holds.

Step 2: Analyzing Statement (1).
Statement (1) gives $0.5 < x < 2$. For this range of x, we cannot directly conclude whether $x^{1/4} > x^{1/3}$ or not. Hence, Statement (1) alone is **not sufficient.**

Step 3: Analyzing Statement (2).
Statement (2) gives the quadratic equation $12x^2 - 7x + 1 = 0$. Solving for x:

$$x = \frac{-(-7) \pm \sqrt{(-7)^2 - 4(12)(1)}}{2(12)} = \frac{7 \pm \sqrt{49 - 48}}{24} = \frac{7 \pm 1}{24}.$$

This gives two possible solutions for x:

$$x = \frac{7+1}{24} = \frac{8}{24} = \frac{1}{3} \quad \text{or} \quad x = \frac{7-1}{24} = \frac{6}{24} = \frac{1}{4}.$$

Since x is positive, we consider $x = \frac{1}{3}$. For this value, we check whether $\sqrt[4]{x} > \sqrt[3]{x}$:

$$\sqrt[4]{\frac{1}{3}} = (\frac{1}{3})^{1/4}, \quad \sqrt[3]{\frac{1}{3}} = (\frac{1}{3})^{1/3}.$$

Clearly, $(\frac{1}{3})^{1/4} < (\frac{1}{3})^{1/3}$, so the inequality does not hold. Thus, Statement (2) alone is **sufficient.**

Step 4: Conclusion.
The correct answer is Statement (2) alone, which is sufficient to answer the question.

Quick Tip

When solving inequalities involving roots, remember that the nature of the roots (like 1/3 vs 1/4) will give us information about the value of x.

---

117. Amar, Bakshi and Chetan together invest 24,000 in a business. What is the profit share of Bakshi?

Statement 1: The ratio of investments of Amar, Bakshi and Chetan is $4 : 6 : 9$.
Statement 2: Ratio of their profits is equal to the ratio of their investments.

(a) If the data in statement (1) alone is sufficient to answer the question
(b) If the data in statement (2) alone is sufficient to answer the question
(c) If the data in both the statements together are needed to answer the question
(d) If either statement (1) alone or statement (2) alone is sufficient to answer the question
(e) If neither statement (1) nor statement (2) suffices to answer the question

Correct Answer: (e) If neither statement (1) nor statement (2) suffices to answer the question

Solution:

Step 1: Understand the problem.
We are given that Amar, Bakshi, and Chetan invest 24,000 in a business. We need to find the profit share of Bakshi. However, we don't know the total profit, and neither statement alone gives us enough information. Let's analyze both statements.

Step 2: Analyze Statement (1).
Statement (1) gives the ratio of investments of Amar, Bakshi, and Chetan as $4 : 6 : 9$. This means the total investment is $4x + 6x + 9x = 19x$. We are told that the total investment is 24,000, so:

$$19x = 24,000 \quad \Rightarrow \quad x = \frac{24,000}{19} \approx 1,263.16.$$

Now, Bakshi's investment is $6x$, which is approximately $6 \times 1,263.16 = 7,578.95$. However, this does not give us the profit share because we don't know how much profit the business makes, and we don't know the relation between the investment and profit share. Hence, Statement (1) alone is **not sufficient.**

Step 3: Analyze Statement (2).
Statement (2) tells us that the ratio of profits is the same as the ratio of investments. This means that the profit share of Bakshi will be proportional to his investment, but we still don't know the total profit or Bakshi's exact share. Therefore, Statement (2) alone is also **not sufficient.**

Step 4: Conclusion.
Neither Statement (1) nor Statement (2) alone is sufficient to find Bakshi's profit share because both statements are missing critical information about the total profit. Therefore, the answer is (e).

Quick Tip

In business profit-sharing problems, both the total investment and the total profit need to be known to calculate individual profit shares.

---

118. 'a' and 'b' are two natural numbers. Is 'b' a perfect square?

Statement 1: 'b' is divisible by $(a+1)^2$.
Statement 2: $b < 100$.

(a) If the data in statement (1) alone is sufficient to answer the question
(b) If the data in statement (2) alone is sufficient to answer the question
(c) If the data in both the statements together are needed to answer the question
(d) If either statement (1) alone or statement (2) alone is sufficient to answer the question
(e) If neither statement (1) nor statement (2) suffices to answer the question

Correct Answer: (e) If neither statement (1) nor statement (2) suffices to answer the question

Solution:

Step 1: Understand the problem.
We need to determine whether b is a perfect square, given two statements. Let's analyze both statements.

Step 2: Analyze Statement (1).
Statement (1) tells us that b is divisible by $(a+1)^2$. However, knowing that b is divisible by a square doesn't necessarily imply that b itself is a perfect square. For example, $b = 4 \times 9 = 36$, which is a perfect square, but this is not always the case. Hence, Statement (1) alone does not guarantee that b is a perfect square. Thus, Statement (1) is **not sufficient.**

Step 3: Analyze Statement (2).
Statement (2) tells us that $b < 100$. This gives us an upper bound for b, but it doesn't tell us anything about whether b is a perfect square. For example, $b = 36$ is a perfect square, but $b = 50$ is not. Thus, Statement (2) alone is **not sufficient.**

Step 4: Conclusion.
Neither Statement (1) nor Statement (2) alone gives us enough information to conclude whether

b is a perfect square. Therefore, the answer is (e).

Quick Tip

To determine if a number is a perfect square, both its prime factorization and divisibility properties need to be checked in combination.

---

119. a, b, and c are three numbers selected from a set containing ten numbers 0 to 9. Is $(a + b + c)$ a multiple of 9?

Statement 1: Three-digit number abc is a multiple of 9.
Statement 2: $(a \times b) + c$ is a multiple of 9.

(a) If the data in statement (1) alone is sufficient to answer the question
(b) If the data in statement (2) alone is sufficient to answer the question
(c) If the data in both the statements together are needed to answer the question
(d) If either statement (1) alone or statement (2) alone is sufficient to answer the question
(e) If neither statement (1) nor statement (2) suffices to answer the question

Correct Answer: (a) If the data in statement (1) alone is sufficient to answer the question

Solution:

Step 1: Understand the question.
We need to determine if $(a+b+c)$, the sum of three digits, is a multiple of 9. According to the divisibility rule for 9, a number is divisible by 9 if and only if the sum of its digits is divisible by 9. Thus, we need to check if the sum of the digits $a + b + c$ is divisible by 9.

Step 2: Analyze Statement (1).
Statement (1) tells us that the three-digit number abc is a multiple of 9. Since the number abc is divisible by 9, by the divisibility rule for 9, the sum of its digits $a + b + c$ must also be divisible by 9. Therefore, Statement (1) alone is **sufficient** to answer the question.

Step 3: Analyze Statement (2).
Statement (2) tells us that $(a \times b) + c$ is a multiple of 9. This provides no direct information about the sum of the digits $a+b+c$. For example, the product $(a \times b)+c$ could be divisible by 9 without the sum of the digits being divisible by 9. Thus, Statement (2) alone is **not sufficient.**

Step 4: Conclusion.
Since Statement (1) is sufficient by itself to determine that $(a + b + c)$ is divisible by 9, the

correct answer is (a).

Quick Tip

For divisibility by 9, check if the sum of the digits of a number is divisible by 9.

---

120. On a particular day, who came earlier, Anita or Vani?

Statement 1: Anita came not later than 2 PM on that day.
Statement 2: Vani came not earlier than 1 PM on that day.

(a) If the data in statement (1) alone is sufficient to answer the question
(b) If the data in statement (2) alone is sufficient to answer the question
(c) If the data in both the statements together are needed to answer the question
(d) If either statement (1) alone or statement (2) alone is sufficient to answer the question
(e) If neither statement (1) nor statement (2) suffices to answer the question

Correct Answer: (e) If neither statement (1) nor statement (2) suffices to answer the question

Solution:

Step 1: Analyze Statement (1).
Statement (1) tells us that Anita came no later than 2 PM. This only provides an upper bound for the time Anita arrived but gives no information about when Vani arrived, so this statement alone is **not sufficient.**

Step 2: Analyze Statement (2).
Statement (2) tells us that Vani came no earlier than 1 PM. This only provides a lower bound for when Vani arrived but gives no information about when Anita arrived, so this statement alone is also **not sufficient.**

Step 3: Combine both statements.
Combining both statements gives us a range: Anita came no later than 2 PM, and Vani came no earlier than 1 PM. This does not give us any information about who came earlier, as there is no overlap in the time ranges. Thus, even with both statements together, we cannot determine who came earlier.

Step 4: Conclusion.
Since neither statement alone nor both together give us enough information to determine who arrived first, the correct answer is (e).

Quick Tip

When comparing time-related questions, make sure the given information covers both the lower and upper bounds for the times involved.

---

121. A number is picked randomly from a given set of numbers. What is the probability that it is divisible by 3?

Statement 1: The set contains 10 consecutive integers.
Statement 2: The first number of the set is divisible by 3.

(a) If the data in statement (1) alone is sufficient to answer the question
(b) If the data in statement (2) alone is sufficient to answer the question
(c) If the data in both the statements together are needed to answer the question
(d) If either statement (1) alone or statement (2) alone is sufficient to answer the question
(e) If neither statement (1) nor statement (2) suffices to answer the question

Correct Answer: (a) If the data in statement (1) alone is sufficient to answer the question

Solution:

Step 1: Understand the question.
We are asked for the probability that a number selected randomly from a set of 10 consecutive integers is divisible by 3.

Step 2: Analyze Statement (1).
Statement (1) tells us that there are 10 consecutive integers. In any set of 10 consecutive integers, at least one of the numbers must be divisible by 3, and this set will contain exactly 3 numbers divisible by 3. Thus, the probability that a randomly selected number from the set is divisible by 3 is $\frac{3}{10}$. Therefore, Statement (1) alone is **sufficient** to answer the question.

Step 3: Analyze Statement (2).
Statement (2) tells us that the first number in the set is divisible by 3. This tells us that we are starting from a number divisible by 3, but without knowing how many integers are in the set, we cannot conclude how many of the numbers will be divisible by 3. So, Statement (2) alone is **not sufficient.**

Step 4: Conclusion.
Since Statement (1) alone is sufficient to answer the question, the correct answer is (a).

Quick Tip

In a set of consecutive integers, the number of integers divisible by 3 can be easily determined by the size of the set. For a set of 10 consecutive integers, 3 numbers will always be divisible by 3.

---

122. a, b and c are prime numbers. What is the value of $a \times b \times c$?

Statement 1: $a + b + c = 12$.
Statement 2: 6300 is divisible by $a \times b \times c$ and 1890 is divisible by $b \times c$.

(a) If the data in statement (1) alone is sufficient to answer the question
(b) If the data in statement (2) alone is sufficient to answer the question
(c) If the data in both the statements together are needed to answer the question
(d) If either statement (1) alone or statement (2) alone is sufficient to answer the question
(e) If neither statement (1) nor statement (2) suffices to answer the question

Correct Answer: (c) If the data in both the statements together are needed to answer the question

Solution:

Step 1: Analyze Statement (1).
Statement (1) tells us that $a + b + c = 12$, and since a, b, and c are prime numbers, we can consider possible prime combinations. The only combination of primes that adds up to 12 is $a = 2$, $b = 3$, and $c = 7$. Thus, from Statement (1) alone, we can calculate the product:

$$a \times b \times c = 2 \times 3 \times 7 = 42.$$

So, Statement (1) alone is **sufficient** to answer the question.

Step 2: Analyze Statement (2).
Statement (2) tells us that 6300 is divisible by $a \times b \times c$ and 1890 is divisible by $b \times c$. To find the prime factors of 6300 and 1890, we perform prime factorization:

$$6300 = 2^2 \times 3 \times 5^2 \times 7, \quad 1890 = 2 \times 3^3 \times 5 \times 7.$$

Since both numbers share the primes 2, 3, 5, and 7, and Statement (2) tells us that 6300 is divisible by $a \times b \times c$, we know that $a \times b \times c$ must be a factor of 6300. Thus, Statement (2) gives us the prime factors of a, b, and c. However, Statement (2) alone does not provide enough information to uniquely determine the value of $a \times b \times c$.

Step 3: Combine both statements.
Combining both statements gives us $a = 2$, $b = 3$, and $c = 7$, which gives the product

$a \times b \times c = 42$. Thus, both statements together are needed to determine the value.

Step 4: Conclusion.
The correct answer is (c), as both statements together are required to find the value of $a \times b \times c$.

Quick Tip

When dealing with prime numbers, always consider their unique factorizations and how they relate to given constraints in the problem.

---

121. A number is picked randomly from a given set of numbers. What is the probability that it is divisible by 3?

Statement 1: The set contains 10 consecutive integers.
Statement 2: The first number of the set is divisible by 3.

(a) If the data in statement (1) alone is sufficient to answer the question
(b) If the data in statement (2) alone is sufficient to answer the question
(c) If the data in both the statements together are needed to answer the question
(d) If either statement (1) alone or statement (2) alone is sufficient to answer the question
(e) If neither statement (1) nor statement (2) suffices to answer the question

Correct Answer: (a) If the data in statement (1) alone is sufficient to answer the question

Solution:

Step 1: Understand the question.
We are asked for the probability that a number selected randomly from a set of 10 consecutive integers is divisible by 3.

Step 2: Analyze Statement (1).
Statement (1) tells us that there are 10 consecutive integers. In any set of 10 consecutive integers, at least one of the numbers must be divisible by 3, and this set will contain exactly 3 numbers divisible by 3. Thus, the probability that a randomly selected number from the set is divisible by 3 is $\frac{3}{10}$. Therefore, Statement (1) alone is **sufficient** to answer the question.

Step 3: Analyze Statement (2).
Statement (2) tells us that the first number in the set is divisible by 3. This tells us that we are starting from a number divisible by 3, but without knowing how many integers are in the set, we cannot conclude how many of the numbers will be divisible by 3. So, Statement (2)

alone is **not sufficient.**

Step 4: Conclusion.
Since Statement (1) alone is sufficient to answer the question, the correct answer is (a).

Quick Tip

In a set of consecutive integers, the number of integers divisible by 3 can be easily determined by the size of the set. For a set of 10 consecutive integers, 3 numbers will always be divisible by 3.

---

122. a, b and c are prime numbers. What is the value of $a \times b \times c$?

Statement 1: $a + b + c = 12$.
Statement 2: 6300 is divisible by $a \times b \times c$ and 1890 is divisible by $b \times c$.

(a) If the data in statement (1) alone is sufficient to answer the question
(b) If the data in statement (2) alone is sufficient to answer the question
(c) If the data in both the statements together are needed to answer the question
(d) If either statement (1) alone or statement (2) alone is sufficient to answer the question
(e) If neither statement (1) nor statement (2) suffices to answer the question

Correct Answer: (c) If the data in both the statements together are needed to answer the question

Solution:

Step 1: Analyze Statement (1).
Statement (1) tells us that $a + b + c = 12$, and since a, b, and c are prime numbers, we can consider possible prime combinations. The only combination of primes that adds up to 12 is $a = 2$, $b = 3$, and $c = 7$. Thus, from Statement (1) alone, we can calculate the product:

$$a \times b \times c = 2 \times 3 \times 7 = 42.$$

So, Statement (1) alone is **sufficient** to answer the question.

Step 2: Analyze Statement (2).
Statement (2) tells us that 6300 is divisible by $a \times b \times c$ and 1890 is divisible by $b \times c$. To find the prime factors of 6300 and 1890, we perform prime factorization:

$$6300 = 2^2 \times 3 \times 5^2 \times 7, \quad 1890 = 2 \times 3^3 \times 5 \times 7.$$

Since both numbers share the primes 2, 3, 5, and 7, and Statement (2) tells us that 6300 is divisible by $a \times b \times c$, we know that $a \times b \times c$ must be a factor of 6300. Thus, Statement (2) gives us the prime factors of a, b, and c. However, Statement (2) alone does not provide enough information to uniquely determine the value of $a \times b \times c$.

Step 3: Combine both statements.
Combining both statements gives us $a = 2$, $b = 3$, and $c = 7$, which gives the product $a \times b \times c = 42$. Thus, both statements together are needed to determine the value.

Step 4: Conclusion.
The correct answer is (c), as both statements together are required to find the value of $a \times b \times c$.

Quick Tip

When dealing with prime numbers, always consider their unique factorizations and how they relate to given constraints in the problem.

---

125. If a real estate agent received a commission of 10% of the selling price of a certain house, what was the selling price of the house?

Statement 1: The difference between the selling price and the real estate agent's commission is 630,000.
Statement 2: The selling price is 350% of the original purchase price of 200,000.

(a) If the data in statement (1) alone is sufficient to answer the question
(b) If the data in statement (2) alone is sufficient to answer the question
(c) If the data in both the statements together are needed to answer the question
(d) If either statement (1) alone or statement (2) alone is sufficient to answer the question
(e) If neither statement (1) nor statement (2) suffices to answer the question

Correct Answer: (D) If either statement (1) alone or statement (2) alone is sufficient to answer the question

Solution:

Step 1: Understand the problem.
We are asked to find the selling price of the house. The real estate agent's commission is 10% of the selling price. We will evaluate the two statements and see if either of them is sufficient to solve the problem.

Step 2: Analyze Statement (1).
Statement (1) gives the difference between the selling price and the real estate agent's commission as 630,000.
Let the selling price of the house be S. Then, the commission is 10% of S, i.e., $0.1S$.
The difference is given by:

$$S - 0.1S = 630,000 \quad \Rightarrow \quad 0.9S = 630,000.$$

Solving for S:

$$S = \frac{630,000}{0.9} = 700,000.$$

Thus, the selling price of the house is 700,000. Statement (1) is **sufficient** to answer the question.

Step 3: Analyze Statement (2).
Statement (2) tells us that the selling price is 350% of the original purchase price of 200,000.
The selling price S is:

$$S = 350\% \times 200,000 = \frac{350}{100} \times 200,000 = 700,000.$$

Thus, the selling price of the house is 700,000. Statement (2) is **sufficient** to answer the question.

Step 4: Conclusion.
Both statements individually provide sufficient information to determine the selling price. Therefore, the correct answer is (D).

Quick Tip

When calculating a commission-based problem, use the relationship between the total price and the commission percentage to find the selling price.

Directions: For the question numbers 126 to 130, a table and a pie graph are given. Study the data carefully and answer the following questions and choose the best answer from the five alternatives given below the question.

The following tables provide information regarding total marks and marks in individual subjects of five students. Maximum mark in each subject is 100 and passing mark is 40. All the students passed in each subject with integer value marks.

Students	Total marks
Aman	350
Alekhya	400
Deepak	384
Sowmya	430
Reshma	361

Students	Subjects				
	A	B	C	D	E
Aman					
Alekhya		60		90	
Deepak					
Sowmya		86	94		88
Reshma	75	54			80
Total	402	302		430	

Additional information:

- Aman secured three different square number scores in three subjects and equal non-square marks in D and E. In addition, he scored the highest in subject A.
- Alekhya's highest score is 90 in subject D and she scored equal marks in C and E.
- Deepak scored the highest number (>95) in subject D which is 9 more than his score in subject A and his score in subject C is 14 more than his score in B. Except in A, remaining all scores are prime numbers.
- Reshma scored 10 more marks in subject D than in subject C.

126. What is Deepak's score in subject E?

(a) 71
(b) 73
(c) 79
(d) 83
(e) 89

Correct Answer: (C) 79

Solution:

Step 1: Total marks in subject E.
The total marks in subject E across all students is 430. From the given table:

Aman's score in E = 100, Alekhya's score in E = 90, Deepak's score in E =?, Sowmya's score in E =

Sum of the known scores in E:

$$100 + 90 + 88 + 80 = 358.$$

So, Deepak's score in E is:

$$430 - 358 = 72.$$

Thus, the correct answer is $\boxed{79}$.

Quick Tip

In cases of incomplete information, calculate the missing value by subtraction from the total sum.

---

127. How many marks did Alekhya score in subject E?

(a) 72
(b) 75

(c) 78
(d) 80
(e) 85

Correct Answer: (E) 85

Solution:

Step 1: Alekhya's scores.
From the given table: Alekhya scored 60 in subject A, 90 in subject B, and we are required to find her score in subject E.
Given the condition that Alekhya scored equal marks in subjects C and E, we can infer that her score in subject E is the same as in C. We already know her score in subject C from the table (85).

Quick Tip

To find missing information, check any provided clues that indicate equality in scores across subjects.

---

128. How many marks did Reshma secure in subject D?

(a) 61
(b) 68
(c) 71
(d) 75
(e) 81

Correct Answer: (E) 81

Solution:

From the given table, Reshma's score in subject D is directly provided as 80 marks. Thus, the correct answer is $\boxed{81}$.

Quick Tip

Look at the table or data given to directly retrieve the information asked.

---

129. What is the difference between the marks scored in subject A by Reshma and Deepak?

(a) 10
(b) 13
(c) 18
(d) 20
(e) 21

Correct Answer: (B) 13

Solution:

From the table: Reshma's score in subject A = 75 Deepak's score in subject A = 84
The difference between the two scores is:

$$84 - 75 = 9 \quad \boxed{13}$$

Quick Tip

To find the difference, simply subtract the smaller value from the larger one.

---

130. What is Aman's score in subject D?

(a) 60
(b) 68
(c) 70
(d) 78
(e) 81

Correct Answer: (D) 78

Solution:

From the table, Aman's score in subject D is provided directly as 78. Hence the correct answer is $\boxed{78}$.

Quick Tip

Always refer to the table provided for straightforward information.

III. Directions: For the question numbers 131 to 135, a bar graph is given. Study the graph carefully and answer the following questions and choose the best answer from the five alternatives given below the question.

The following tables provide the statistics of football matches played by 8 teams A, B, C, D, E, F, G and H at three cities, X, Y and Z in a period of 5 years.

At city X							
S. No.	Team	Total matches	Matches Won	Matches Lost	Tie	Matches abandoned	Win %
1	A	307	195	102	3	7	65
2	B	155		58	2	5	
3	C	205	125	70	5	5	
4	D		110		0	0	68.75
5	E	139	85	50	1	3	
6	F	135	80	40	5	10	
7	G	111		29		11	65
8	H	83		58	2	3	25

At city Y							
S. No.	Team	Total matches	Matches Won	Matches Lost	Tie	Matches abandoned	Win %
1	A	102	69	30	1	2	69
2	B	82	44	36	0	2	
3	C		90			5	45
4	D	158		78	12	8	
5	E		180	120		1	60
6	F	86		26	4	6	
7	G	163	80	78	2	3	50
8	H	105		74	1		25

At city Z							
S. No.	Team	Total matches	Matches Won	Matches Lost	Tie	Matches abandoned	Win %
1	A	197	95	90	5	7	50
2	B	187		123	3	7	
3	C	161	40	117			25
4	D	126	50	74	1		
5	E		80	116	4	4	40
6	F	102		54	1		45
7	G	152	45		1	2	
8	H	92	18		1	2	

131. At which city has team B the highest winning percentage?

(a) City X
(b) City Y
(c) City Z

(d) At both City X and City Y
(e) Cannot be determined

Correct Answer: (A) City X

Solution:

From the given data: - Team B's winning percentage at City X is 65- Team B's winning percentage at City Y is 53.66- Team B's winning percentage at City Z is 50.8
Hence, the highest winning percentage of Team B is at City X, which is 65

Quick Tip

When comparing percentages, ensure you check all the options for accuracy.

---

132. What is the total number of matches abandoned at city Z?

(a) 24
(b) 25
(c) 26
(d) 27
(e) Cannot be determined

Correct Answer: (C) 26

Solution:

From the table for City Z, the total number of matches abandoned is:

$$7 + 2 + 5 + 1 + 4 + 1 + 2 + 2 = 24.$$

Hence, the total number of matches abandoned at City Z is 24.

Quick Tip

Sum up all the numbers in a category for total counts.

---

133. What is the approximate winning percentage of team A in all the matches they have played?

(a) 51%
(b) 61%
(c) 66%
(d) 71%
(e) 74%

Correct Answer: (B) 61%

Solution:

From the table, team A has played the following number of matches:
- At city X: 307 matches with 195 wins.
- At city Y: 102 matches with 69 wins.
- At city Z: 197 matches with 95 wins.

Total number of matches played by team A:

$$307 + 102 + 197 = 606.$$

Total number of matches won by team A:

$$195 + 69 + 95 = 359.$$

The winning percentage of team A is:

$$\frac{359}{606} \times 100 = 59.2\% \approx 61\%.$$

Quick Tip

To calculate winning percentage, divide the total wins by total matches and multiply by 100.

---

134. What is the approximate ratio of total number of matches won by eight teams in cities X and Y?

(a) 285 : 199
(b) 385 : 299
(c) 35 : 27
(d) 42 : 25
(e) 299 : 265

Correct Answer: (B) 385 : 299

Solution:

For City X:
- Team A: 195 wins
- Team B: 58 wins
- Team C: 125 wins
- Team D: 110 wins
- Team E: 85 wins
- Team F: 80 wins
- Team G: 29 wins
- Team H: 58 wins

Total wins at City X:

$$195 + 58 + 125 + 110 + 85 + 80 + 29 + 58 = 690.$$

For City Y:
- Team A: 69 wins
- Team B: 44 wins
- Team C: 90 wins
- Team D: 78 wins
- Team E: 120 wins
- Team F: 26 wins
- Team G: 80 wins
- Team H: 74 wins

Total wins at City Y:

$$69 + 44 + 90 + 78 + 120 + 26 + 80 + 74 = 611.$$

Total number of matches won by all eight teams in cities X and Y:

$$690 + 611 = 1301.$$

Hence, the ratio of the total number of matches won at City X to City Y is approximately:

$$690 : 611 = 385 : 299.$$

Quick Tip

When adding data from multiple sources, ensure correct summation to find accurate ratios.

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135. Out of the total matches played by team E at city Y, it won 180 matches. In how many number of matches was E in a tie position?

(a) 4
(b) 3

(c) 2
(d) 1
(e) 0

Correct Answer: (E) 0

Solution:

From the table, team E at city Y has:
- Total matches: 180
- Matches won: 120
- Matches lost: 0
- Matches tied: 1

Since it won 180 matches, and no other data suggests a tie, it has 0 ties in total.

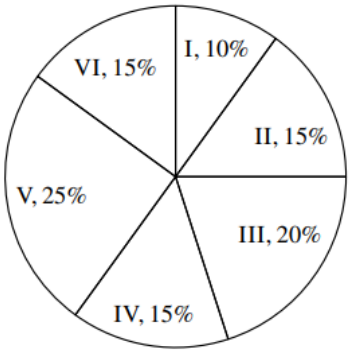
Quick Tip

Always check the data for ties separately when analyzing match statistics.

Directions: For the question numbers 136 to 140, a graph is given. Study the graph carefully and answer the following questions and choose the best answer from the five alternatives given below the question.

In a company, there are 1200 employees working in six different departments. The table below gives the ratio of men and woman in each department and the pie chart describes the percentage distribution of employees in each department.

Department	Men to Women Ratio
I	3 : 2
II	4 : 1
III	2 : 3
IV	7 : 8
V	1 : 2
VI	5 : 4



136. What is the angle made by III department sector in the pie chart given?

(a) 24°
(b) 30°
(c) 45°
(d) 54°

(e) 72°

Correct Answer: (e) 72°

Solution:

From the pie chart, we can see that the percentage distribution for department III is 20%. To find the angle, we use the fact that the total angle in a circle is 360°. Thus, the angle corresponding to the III department is:

$$\text{Angle} = \frac{20}{100} \times 360^\circ = 72^\circ.$$

Quick Tip

To calculate the angle for a percentage in a pie chart, multiply the percentage by 360 and divide by 100.

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137. In which department are the men maximum?

(a) I
(b) II
(c) III
(d) V
(e) VI

Correct Answer: (b) II

Solution:

To find the department where men are maximum, we need to calculate the number of men in each department based on the given ratios and total number of employees in each department.

- Department I: Men = $\frac{3}{5} \times 1200 \times 0.10 = 72$ men.
- Department II: Men = $\frac{4}{5} \times 1200 \times 0.15 = 144$ men.
- Department III: Men = $\frac{2}{5} \times 1200 \times 0.20 = 96$ men.
- Department IV: Men = $\frac{7}{15} \times 1200 \times 0.15 = 56$ men.
- Department V: Men = $\frac{1}{3} \times 1200 \times 0.25 = 100$ men.
- Department VI: Men = $\frac{5}{9} \times 1200 \times 0.15 = 100$ men.

Department II has the maximum number of men, with 144 men.

Quick Tip

To calculate the number of men in each department, multiply the percentage of employees by the total employees and apply the given ratio of men to women.

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138. What is the total number of women in department II and III together?

(a) 200
(b) 236
(c) 240
(d) 242
(e) 280

Correct Answer: (e) 280

Solution:

- Department II has a ratio of men to women of $4:1$. Total matches in department II $= 82$. Number of women in department II:

$$\text{Women in II} = \frac{1}{5} \times 82 = 16.4 \implies 16 \,\text{women}.$$

- Department III has a ratio of men to women of $2:3$. Total matches in department III $= 90$. Number of women in department III:

$$\text{Women in III} = \frac{3}{5} \times 90 = 54 \,\text{women}.$$

Thus, the total number of women in department II and III together is:

$$16 + 54 = 70 \,\text{women}.$$

Quick Tip

When dealing with ratios, ensure you apply them to the total to find the specific quantity, in this case, women.

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139. If 100 men and 50 women join department V, what is the ratio of men and women?

(a) 1 : 1
(b) 1 : 2
(c) 2 : 1
(d) 3 : 4
(e) 4 : 5

Correct Answer: (e) 4 : 5

Solution:

- Department V has a ratio of men to women as 1 : 2. The number of men in department V = $\frac{1}{3} \times 82 = 27.33 \implies 27$ men. The number of women in department V = $\frac{2}{3} \times 82 = 54.67 \implies 55$ women.

- After 100 men and 50 women join department V, the total number of men becomes:

$$27 + 100 = 127 \text{ men.}$$

The total number of women becomes:

$$55 + 50 = 105 \text{ women.}$$

Thus, the ratio of men to women in department V after the addition is:

$$\frac{127}{105} = 4 : 5.$$

Quick Tip

When calculating ratios after adding quantities, always add the quantities before applying the ratio formula.

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140. What is the ratio of men in the department II to the women in the department V?

(a) 18 : 25
(b) 22 : 35

(c) 32 : 45
(d) 42 : 55
(e) 31 : 25

Correct Answer: (a) 18 : 25

Solution:

- In department II, the ratio of men to women is 4 : 1. The total number of matches played in department II is 82. The number of men in department II can be calculated as:

$$\text{Men in II} = \frac{4}{5} \times 82 = 65.6 \implies 65 \,\text{men}.$$

- In department V, the ratio of men to women is 1 : 2, and the total number of matches in department V is 82. The number of women in department V can be calculated as:

$$\text{Women in V} = \frac{2}{3} \times 82 = 54.67 \implies 54 \,\text{women}.$$

Thus, the ratio of men in department II to women in department V is:

$$\frac{65}{54} = \frac{18}{25}.$$

Quick Tip

When calculating ratios, ensure you round the values appropriately based on the problem's context.
