

Answers

1. Answer: d

Explanation:

Detailed Analysis of the Speaker's Message in the Passage

Understanding the Speaker's Determination

The provided passage outlines a resolute and unwavering stance in the face of adversity. The speaker uses strong language to convey a commitment to continue fighting across various locations, including France, the seas, the air, beaches, landing grounds, fields, streets, and hills. The core message emphasizes a determination to defend their island "whatever the cost" and a pledge to "never surrender." It also mentions a backup plan involving the empire and the New World if the island were to be overcome.

Evaluating Each Option Against the Passage

Let's examine each option to see how well it aligns with the tone and content of the passage:

- **Option 1: The speaker is encouraging his men for the conquest of France**

The passage mentions fighting *in* France, but the primary focus is on the **defence of the island**. The fighting in France is presented as part of a broader struggle, not specifically as a mission for conquest. Therefore, this statement is not fully supported by the text.

- **Option 2: The speaker is an aggressive and maniacal war-monger**

While the language used is forceful and determined ("we shall fight," "never surrender"), it is framed within the context of **defence** and resistance against potential subjugation. Describing the speaker as "maniacal" seems excessive

and doesn't capture the defensive nature of the commitment expressed in the passage.

- **Option 3: The speaker is not satisfied with the conquest of the island**

This option misinterprets the passage's central theme. The passage is about the **defence of the island**, not its conquest. The speaker's goal is to protect the island at all costs, not to conquer it or express dissatisfaction with a conquest.

- **Option 4: The speaker is a patriot urging the defence of his motherland**

This statement accurately reflects the passage's content and tone. The unwavering commitment to fight, the emphasis on defending the island ("our island"), and the refusal to surrender demonstrate strong **patriotism**. The speaker is rallying support for the **defence of their motherland**, inspiring resilience even in the face of potential defeat.

Conclusion on the Speaker's Role

Based on the analysis, the passage strongly suggests a leader who is deeply committed to their country. The repeated calls to fight, the vow to never surrender, and the focus on defending their home clearly indicate a deep sense of patriotism. Option 4 best captures this sentiment, portraying the speaker as a patriot urging the defence of his motherland.

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2. Answer: c

Explanation:

Passage Context and Fighting Resolve

The provided passage is a powerful declaration of unwavering determination to continue a conflict under challenging circumstances. The speaker outlines a comprehensive commitment to **fight** in various locations, emphasizing resilience regardless of the cost. The core message is one of defiance and persistence, even if faced with significant setbacks like the potential subjugation of their island.

Reasons for Continuing the Fight

The question asks for the speaker's motivation to keep fighting, based on the passage. Let's analyze the options in light of the text:

- **Option 1: He is a raving lunatic**

The passage demonstrates strategic thinking and resolve, mentioning specific places to **fight** and a plan involving allies. This suggests a clear, albeit determined, mindset rather than lunacy.

- **Option 2: He is in a state of utter despair**

The tone of the passage is defiant and resolute, not one of hopelessness. Words like "never surrender" and the plan to carry on the struggle clearly contradict the idea of **utter despair**.

- **Option 3: He expects help from other quarters**

This option is strongly supported by the text. The passage explicitly states: "...then our empire beyond the seas would carry on the struggle until the **New world** steps forth to the **rescue** and the **liberation** of the Old." This directly indicates an expectation of support and eventual **help** from external allies (the empire and the New World).

- **Option 4: He is the leader of a suicide squad**

A suicide mission implies fighting without hope of survival or strategic success. The passage, however, speaks of carrying on the struggle until external **rescue** and **liberation**, suggesting a long-term strategy that includes eventual success, not a final, hopeless stand.

Passage Support for Expecting Help

The key evidence supporting the reason for continued fighting comes from the latter part of the passage. The speaker outlines a contingency plan should their home island face severe difficulties. The commitment to continue the struggle hinges on the actions of allies:

"...even if this island or a large part of it were subjugated and starving, then our empire beyond the seas would carry on the struggle until the New world steps forth to the rescue and the liberation of the Old."

This statement clearly shows that the continuation of the fight is partly predicated on the expectation of intervention and aid from the **empire beyond the seas** and the **New world**. This makes option 3 the most accurate explanation based on the provided text.

3. Answer: a

Explanation:

Analyzing the Speaker's Intention in the Passage

The provided passage is a powerful declaration of resolve and determination in the face of conflict. The speaker outlines a commitment to fight relentlessly across various locations and conditions. Key themes include unwavering persistence, defiance against overwhelming odds, and a refusal to capitulate.

Understanding the Speaker's Core Intention

The primary goal of the speaker is to convey an unshakeable commitment to continue the struggle until victory or the very end. This intention is built on defiance and the absolute refusal to give up, regardless of the cost or the potential hardships faced. The speech aims to inspire resilience and maintain morale by emphasizing continuous resistance.

Evaluation of Phrase Pairs

Let's examine how different pairs of phrases reflect the speaker's overarching intention:

- **"Go on to the end"**: This phrase directly speaks to the speaker's intention of seeing the conflict through to its conclusion, emphasizing persistence.

- **"Shall never surrender"**: This is a clear and direct statement of defiance, highlighting the speaker's resolve not to yield to the enemy under any circumstances.
- **"Growing confidence and strength"**: While indicating a positive outlook, this phrase focuses more on the **means** of fighting rather than the fundamental intention to **continue** fighting or **not surrender**.
- **"Subjugated and starving"**: These words describe potential dire circumstances. While the speech addresses how to proceed even if these conditions arise, they do not represent the core intention itself but rather the context against which the intention operates.
- **"Fighting on the beaches", "fighting in the fields and in the streets", "fighting in the hills"**: These phrases detail the **locations** and **methods** of fighting, illustrating the pervasiveness of the struggle, but they are specific actions supporting the main intention rather than encapsulating it entirely.

Detailed Analysis of Options

Option 1: "Go on to the end", "shall never surrender"

This pair directly captures the essence of the speaker's intention. **"Go on to the end"** signifies relentless persistence, and **"shall never surrender"** emphatically states a commitment to unwavering resistance. Together, they powerfully convey the speaker's core message of absolute determination.

Option 2: "Growing confidence", "subjugated and starving"

This option combines a statement of increasing capability with a description of potential negative conditions. While "growing confidence" reflects a positive aspect of the struggle, "subjugated and starving" represents a possible outcome the speaker is preparing to face, not the fundamental intention itself. This pair does not fully represent the speaker's primary resolve.

Option 3: "Subjugated and starving", fighting on the landing ground"

Similar to option 2, "subjugated and starving" depicts a difficult situation. "Fighting on the landing ground" is a specific instance of resistance. This pair focuses on a

potential challenge and a specific action, failing to capture the broader, overarching intention of persistence and non-surrender.

Option 4: "Fighting in the streets", "subjugated and starving"

This option pairs a specific location of fighting ("fighting in the streets") with a description of potential hardship ("subjugated and starving"). Neither phrase, individually or combined, represents the central theme of unwavering commitment and refusal to surrender as effectively as other options.

Conclusion on Phrase Pair Effectiveness

The phrases **"Go on to the end"** and **"shall never surrender"** most effectively encapsulate the speaker's firm intention. They highlight the core message of unwavering determination and complete refusal to yield, which is the central theme permeating the entire passage.

4. Answer: d

Explanation:

Analyzing Repetitive Syntax and Vocabulary in the Passage

The provided passage is a powerful piece of rhetoric, characterized by distinct repetitive patterns in both syntax (sentence structure) and vocabulary (word choice). Understanding the effect of these stylistic choices is key to answering the question.

Identifying Key Rhetorical Devices

The passage prominently features repetition, a common rhetorical technique. Specifically, it uses:

- **Anaphora:** The repetition of the phrase "we shall fight" at the beginning of successive clauses emphasizes the determination and scope of the intended struggle.
- **Parallelism:** The consistent grammatical structure across phrases like "we shall fight in France," "we shall fight on the seas and oceans," etc., creates rhythm and reinforces the message.
- **Repetition of Core Message:** The phrase "We shall never surrender" is a stark and direct statement of resolve.

These techniques are deliberately employed to create a specific impact on the audience.

Evaluating the Effects of Repetition

Let's examine the effect of these repetitive patterns:

- **Emphasis:** The repetition hammers home the central theme of continued resistance and defiance against any adversity.
- **Rhythm and Momentum:** The patterned structure builds a sense of unwavering commitment and forward momentum.
- **Clarity of Purpose:** The consistent phrasing leaves no doubt about the speaker's goals and determination.

Analyzing the Options

Now, let's consider how the options relate to the passage's stylistic features:

- **Option 1: Reveals the speaker's defects in giving a speech** – The repetition here is a calculated rhetorical strategy, not a flaw. It strengthens, rather than weakens, the speech.
- **Option 2: Produces the impression of bad poetry** – While repetition can be found in poetry, its use in this context serves a political and persuasive purpose, aiming for resolve, not aesthetic critique. The effect is powerful persuasion, not poor artistry.
- **Option 3: Conveys the speaker's helpless situation** – The repeated declarations of fighting and refusal to surrender directly contradict the idea of helplessness. The passage conveys strength and determination, not weakness.

- **Option 4: Reinforces the speaker's basic intention** – This option accurately captures the impact. The core intention of the speaker is to convey unwavering resolve, commitment to fight, and absolute refusal to surrender. The repetitive syntax and vocabulary effectively reinforce this fundamental message throughout the speech excerpt.

Conclusion on Speaker's Intention

The repeated phrases like "we shall fight" across various locations and the strong statement "We shall never surrender" serve to build a powerful, unified message. The consistent structure and word choice leave the audience with a clear understanding of the speaker's unwavering commitment to resist and defend, regardless of the cost or circumstances. Therefore, the repetition strongly **reinforces the speaker's basic intention**.

5. Answer: b

Explanation:

Analyzing the Speaker's Tone in the Passage

The provided passage is a powerful declaration of intent and resolve during a time of conflict. To understand the speaker's **tone**, we need to examine the specific language and repeated phrases used.

Key Phrases and Their Impact:

- **"We shall go on to the end"**: This phrase immediately establishes a sense of determination and commitment, indicating an unwillingness to stop until the objective is achieved.
- **"we shall fight..."**: The repetition of "we shall fight" across various locations (France, seas, oceans, air, beaches, landing grounds, fields, streets, hills) emphasizes a comprehensive and unwavering commitment to resist and combat the enemy everywhere.

- **"whatever the cost may be"**: This phrase highlights a willingness to make sacrifices, showing extreme dedication.
- **"We shall never surrender"**: This is a strong statement of defiance and resilience, ruling out the possibility of giving up.
- **"...our empire beyond the seas would carry on the struggle until the New world steps forth..."**: This extends the commitment beyond the immediate location, showing a broader determination and hope for future support.

Evaluating the Options:

- **Option 1: Pleading and urging** – While the speaker is urging action, the tone is not one of pleading. Pleading suggests weakness or desperation, whereas the language here is strong and resolute.
- **Option 2: Inspiring and encouraging** – The repeated declarations of determination ("we shall fight", "never surrender"), the commitment despite costs, and the hopeful outlook are all designed to boost morale, instill courage, and encourage continued effort. This strongly aligns with an **inspiring and encouraging** tone.
- **Option 3: Discouraging and gloomy** – The passage is the opposite of discouraging. It aims to galvanize people, not to make them feel hopeless or gloomy. The repeated assertion of fighting and not surrendering counters any sense of gloom.
- **Option 4: Menacing and bullying** – The tone is not directed menacingly or in a bullying manner towards any particular group within the speaker's audience. It's a resolute stance against an external foe, meant to unify and strengthen the resolve of the people.

Conclusion on Tone:

The speaker uses strong, repetitive, and resolute language to convey a message of unwavering determination and commitment in the face of adversity. The primary goal appears to be bolstering the morale of the listeners and encouraging them to persevere through difficult times. Therefore, the most fitting description of the speaker's **tone** is **inspiring and encouraging**.

6. Answer: c

Explanation:

Finding the Synonym for MEDDLE

This question requires us to find a word that has a meaning very close to the word **MEDDLE**. This is a common type of vocabulary question that tests understanding of word meanings and synonyms.

Understanding the Meaning of MEDDLE

The word **MEDDLE** means to involve oneself in a matter without right or invitation; to tamper or interfere in affairs that are not one's concern. Think of someone butting into a conversation or situation where they aren't involved or wanted.

Analyzing the Provided Options

Let's break down the meaning of each given option to see how it relates to **MEDDLE**:

- **Disregard:** This means to ignore something or pay no attention to it. It's about not noticing or considering something.
- **Overlook:** This is quite similar to disregard. It means to fail to notice or consider something, or to ignore it deliberately.
- **Interfere:** This word means to become involved in a situation or activity in a way that is not helpful or wanted, often by intruding or meddling.
- **Free:** This word relates to being unrestricted, liberated, or not in captivity. It has no connection to the meaning of meddling.

Identifying the Closest Meaning

By comparing the definitions, we can see which option is the best synonym for **MEDDLE**:

- "Disregard" and "Overlook" mean to ignore, which is the opposite of getting involved.

- "Free" is unrelated to the concept of involvement or interference.
- **"Interfere"** directly matches the core meaning of **MEDDLE** – getting involved in affairs where one is not wanted or needed.

Therefore, the word that is most similar in meaning to **MEDDLE** is **Interfere**.

Conclusion on Synonym

The vocabulary task is to find the best synonym. Based on the analysis, **Interfere** is the most appropriate choice as it shares the core meaning of unwanted involvement with the word **MEDDLE**.

7. Answer: a

Explanation:

Understanding the Meaning of ABJURE

The question asks us to find the word that has a meaning most similar to the word **ABJURE**. Identifying synonyms is a key vocabulary skill.

Defining ABJURE

To **abjure** means to formally give up or reject something, like a belief, a claim, or a cause, often under oath or solemn promise. It implies a strong and official rejection.

Analyzing the Options

Let's look at each option to see which one matches the meaning of **ABJURE**:

- **Option 1: Renounce**

To **renounce** means to formally declare one's abandonment or rejection of a claim, right, title, or desire. This is very close in meaning to **abjure**, as both involve formally giving something up.

- **Option 2: Run off secretly**

This phrase means to leave somewhere quickly and secretly, often to escape responsibility or avoid being caught. This meaning is unrelated to **abjure**.

- **Option 3: Abide**

To **abide** means to accept or comply with something (like a rule or decision) or to live or dwell in a place. This is different from the meaning of **abjure**.

- **Option 4: Discuss**

To **discuss** means to talk about a subject or issue. This has no connection to the meaning of **abjure**.

Conclusion: Identifying the Best Synonym

Comparing the meanings, **Renounce** is the word most similar to **ABJURE** because both involve the act of formally giving up or rejecting something important.

8. Answer: d

Explanation:

Estrange Meaning Explained

The goal here is to find the word that is most similar in meaning to the capitalized word provided, which is "ESTRANGE". First, let's understand what "**estrangle**" means. To **estrangle** someone means to cause a loss of affection or friendliness, making that person feel distant or separated from someone or something they were previously close to. It often implies becoming unfriendly or losing connection.

Vocabulary Option Analysis

We need to examine each of the given options to determine which one best matches the meaning of "**estrangle**".

- **1. Endanger:** This word means to put something or someone at risk or in a situation where they could be harmed. It is about danger, not about changing relationships or feelings. For example, "Walking alone at night might **endanger** your safety."
- **2. To become puzzling:** This phrase describes the state of becoming confusing or difficult to understand. It relates to comprehension and clarity, not social relationships. For instance, "The clues in the mystery novel started to **become puzzling**."
- **3. Miscalculate:** This means to calculate wrongly or make a mistake in calculation. It's related to errors in math or planning, not interpersonal feelings. For example, "They **miscalculated** the budget and ran out of money."
- **4. Alienate:** This word means to cause someone to feel isolated, disconnected, or hostile. It involves making someone feel unwelcome or estranged from a group or relationship. For example, "His rude behaviour tended to **alienate** potential friends."
- (Option 5 appears to be empty and thus cannot be evaluated.)

Synonym Identification for Estrange

Let's compare the meanings we've analyzed:

- "Endanger" is about risk.
- "To become puzzling" is about confusion.
- "Miscalculate" is about errors in calculation.
- "Alienate" is about causing someone to feel isolated or estranged.

Comparing these definitions, we can see that "**alienate**" is very close in meaning to "**estrangle**". Both words describe the process of making someone feel distant, unfriendly, or separated from others. Therefore, "**alienate**" is the word most similar in meaning.

9. Answer: c

Explanation:

Derogatory Meaning and Antonyms Explained

The question asks us to find the word that is most nearly opposite in meaning to the word "DEROGATORY". Understanding the core meaning of "DEROGATORY" is key to finding its correct antonym from the given options.

Understanding "DEROGATORY"

The word "DEROGATORY" means expressing a low opinion or judgment of someone or something. It signifies being critical, belittling, or showing disrespect. Think of it as saying something negative that diminishes the value or reputation of a person or thing.

Analyzing the Options

Let's look at each option provided and see how it relates to "DEROGATORY":

- **Conferred:** This word means to grant or bestow something, like an honor or a title. It is unrelated to the meaning of "DEROGATORY".
- **Immediate:** This word relates to time, meaning happening or done without delay. It does not relate to the meaning of "DEROGATORY".
- **Praising:** This word means expressing approval, admiration, or commendation. It involves speaking highly of someone or something, highlighting their positive qualities. This is the direct opposite of expressing a low opinion or being critical.
- **Private:** This word relates to something kept secret or personal, not intended for public knowledge. It is unrelated to the meaning of "DEROGATORY".

Identifying the Opposite Word

Comparing the meanings, we can see that:

- "DEROGATORY" implies speaking negatively or critically.
- "Praising" implies speaking positively or commendably.

Therefore, "Praising" is the word most nearly opposite in meaning to "DEROGATORY". The other options, "Conferred", "Immediate", and "Private", do not represent an

opposite meaning.

Final Conclusion

The word that serves as the best antonym for "DEROGATORY" among the choices is "Praising", as it signifies positive expression, directly contrasting the negative and belittling nature of "DEROGATORY".

10. Answer: c

Explanation:

Understanding the Antonym of "WANE"

The question asks us to find the word that is most nearly opposite in meaning to the given word, **WANE**. This involves understanding the definition of **WANE** and comparing it with the definitions of the provided options.

Meaning of the Keyword "WANE"

The word **WANE** refers to a process of decreasing in size, strength, or intensity. It often describes something becoming smaller or less noticeable. A common example is the waning moon, which signifies the period when the moon appears to shrink in size after the full moon.

Analyzing the Given Options

We need to look at each option to determine which one best represents the opposite meaning of **WANE**:

- **Option 1: Widen**

The word **Widen** means to make or become wider. While this indicates an increase, it specifically relates to the dimension of width, not the general decrease implied by **WANE**.

- Option 2: Poor

Poor describes a state of lacking wealth or resources, or not being good enough. This meaning is entirely unrelated to the concept of decreasing or increasing in size or intensity.

- Option 3: Swell

The word **Swell** means to increase in size, volume, or intensity. It signifies growth or expansion. This is the direct opposite of decreasing, which is the meaning of **WANE**.

- Option 4: Tight

Tight means firmly secured, fixed, or constricted. It does not relate to the concept of getting smaller or larger in a general sense.

Identifying the Most Opposite Word

Comparing the meanings, **WANE** signifies a decrease, while **Swell** signifies an increase in size or volume. Therefore, **Swell** is the word most nearly opposite in meaning to **WANE**.

11. Answer: a

Explanation:

Identifying Grammatical Errors in Subject-Verb Agreement

This question asks us to identify the specific part of the given sentence that contains a grammatical error. The focus is on ensuring the correct agreement between the subject and the verb.

Understanding Subject-Verb Agreement

A key rule in English grammar is that the verb must match its subject in number. This means a singular subject needs a singular verb, and a plural subject needs a plural verb.

Analyzing the Noun 'Police'

The term '**police**' is a collective noun. In standard English usage, 'police' is almost always treated as a **plural** noun, referring to the police force as a group of individuals or officers collectively. Because it's considered plural, it requires a plural verb.

Examining Sentence Parts for Errors

Let's break down the sentence:

- **Part (a): The police has**
 - Subject: The police (Considered plural)
 - Verb: has (Singular verb)
 - Analysis: Here, the plural subject 'The police' is used with the singular verb 'has'. This is incorrect according to subject-verb agreement rules. The correct verb should be the plural form, 'have'. The phrase should be 'The police have'.
- **Part (b): arrested the thief**
 - Verb: arrested (Past tense)
 - Object: the thief
 - Analysis: This part correctly describes the action performed on the object. The past tense verb 'arrested' is suitable here.
- **Part (c): who broke into my house**
 - Relative Clause: This clause modifies 'the thief'.
 - Verb: broke
 - Analysis: The verb 'broke' correctly refers to the action of the thief entering the house.
- **Part (d): last night**
 - Adverbial Phrase: Indicates the time.
 - Analysis: This phrase correctly provides timing information for the action.

Identifying the Incorrect Part

Based on the analysis, the disagreement between the plural subject 'The police' and the singular verb 'has' occurs in part (a). The sentence should correctly state, "The police **have** arrested the thief who broke into my house last night."

Therefore, the section with the error is (a).

12. Answer: a

Explanation:

Identifying Grammatical Errors in the Sentence

This question requires us to find the specific part of the given sentence that contains a grammatical error.

The sentence is structured as follows:

"The man who (a) / they thought to be (b) / a gentleman turned out (c) / to be a rouse (d)."

We need to examine each labeled part (a), (b), (c), and (d) for mistakes.

Analyzing Relative Pronoun Usage (Part a)

Part (a) consists of the phrase "The man who". Here, "who" is a relative pronoun used to introduce a clause that modifies "The man".

Let's look at the clause introduced by "who": "...they thought to be a gentleman". The full structure is "They thought [the man] to be a gentleman."

In this subordinate clause, "The man" (represented by the relative pronoun) is the object of the verb "thought". According to formal grammar rules, when the relative pronoun acts as an object, the correct pronoun to use is "**whom**".

Therefore, the sentence should correctly read: "The man **whom** they thought to be a gentleman..."

Since the sentence uses "**who**" instead of "**whom**" in part (a), this part contains the grammatical error.

Evaluating Other Parts of the Sentence

- **Part (b) – "they thought to be"**: This phrase follows the relative pronoun and is part of the subordinate clause. Grammatically, it fits the structure, although the pronoun preceding it is incorrect.
- **Part (c) – "a gentleman turned out"**: This part is grammatically correct. "Turned out" functions correctly as a phrasal verb meaning "proved to be".
- **Part (d) – "to be a rouge"**: This part contains a vocabulary or spelling error. The word "rouge" refers to makeup. The intended word is likely "**rogue**", which means a mischievous or dishonest person, fitting the contrast with "gentleman". While this is an error, the primary grammatical case error involving the relative pronoun occurs in part (a).

Conclusion on the Error Location

The most significant grammatical error, concerning the case of the relative pronoun, is found in part (a) where "**who**" is used incorrectly as an object instead of "**whom**".

13. Answer: a

Explanation:

Identifying Errors in English Sentences

The task is to find the part of the given sentence that contains a grammatical error. We need to carefully examine each segment of the sentence.

Sentence Analysis: Finding the Error

The sentence provided is: "I told him on his face (a) / that he should not hope (b) / to pass the stringent (c) / Medical examination of the Services Selection Board(d)."

Let's analyze each part:

- **Part (a): "I told him on his face"**
 - The phrase **"on his face"** is used here.
 - In standard English grammar and idiomatic usage, when referring to telling someone something directly and openly, the correct expression is **"to his face"**.
 - The idiom *"to his face"* means directly or in person, often implying confrontation or boldness.
 - The usage *"on his face"* is incorrect in this context.
- **Part (b): "that he should not hope"**
 - This part of the sentence is grammatically correct. The conjunction *"that"* properly introduces the clause stating what was said. The modal verb *"should"* is used correctly.
- **Part (c): "to pass the stringent"**
 - This segment is also correct. The infinitive phrase *"to pass"* correctly follows the verb *"hope"*. The adjective *"stringent"* means strict or severe, which is appropriate for describing a medical examination.
- **Part (d): "Medical examination of the Services Selection Board"**
 - This part correctly identifies the specific examination and the board. There are no errors in this segment.

Conclusion on Error Location

After reviewing each part of the sentence, the error is clearly located in part (a). The incorrect idiomatic phrase used is "on his face" instead of the correct phrase "to his face".

14. Answer: b

Explanation:

Finding the Grammatical Error: Mohan's Sentence Analysis

The task is to identify the part of the sentence that contains a grammatical error. We need to carefully examine each segment: "(a) Mohan is one of those boys", "(b) who has expressed", "(c) willingness for joining", and "(d) the educational tour".

Part (a): "Mohan is one of those boys"

This first part of the sentence is grammatically correct. The subject 'Mohan' is singular, and it correctly agrees with the singular verb 'is'. The phrase 'one of those boys' is a standard way to introduce a member of a larger group.

Part (b): "who has expressed" – Subject-Verb Agreement Error

This segment contains the identified grammatical error. Let's break it down:

- The word '**who**' is a relative pronoun. It refers back to the noun '**boys**'.
- The noun '**boys**' is plural.
- The rule of **subject-verb agreement** requires that the verb must match its subject in number. In the relative clause "who has expressed...", the subject is 'who'.
- Since 'who' refers to the plural noun 'boys', it must take a plural verb.
- The verb used here is '**has expressed**'. 'Has' is the singular form.
- The correct plural form of the verb is '**have expressed**'.

Therefore, the sentence should correctly state: "Mohan is one of those boys who **have** expressed willingness..." The error lies in using the singular verb 'has' instead of the plural verb 'have'.

Part (c): "willingness for joining" – Preposition Usage

Regarding the phrase 'willingness for joining', while the most common and standard construction is 'willingness **to** join' (using an infinitive) or sometimes 'willingness **in** joining' (using a gerund), the usage of 'willingness **for**' followed by a gerund is less standard. However, compared to the clear subject-verb agreement error in part (b), this prepositional usage is a less definitive error in standard grammar tests.

Part (d): "the educational tour"

This final part of the sentence, 'the educational tour', is grammatically correct. It serves as the object of the verb phrase and contains no errors.

Summary of Error Identification

After analyzing each part, the most significant grammatical error is in **part (b)**. The error is a violation of the subject-verb agreement rule. The relative pronoun 'who', referring to the plural antecedent 'boys', incorrectly uses the singular verb 'has expressed' instead of the required plural verb 'have expressed'.

Corrected Sentence: Mohan is one of those boys who **have** expressed willingness for joining the educational tour.

Part	Analysis	Grammatical Rule	Status
(a) Mohan is one of those boys	Correct subject-verb agreement ('Mohan is'). Introduces Mohan as part of a group.	Subject-Verb Agreement	Correct
(b) who has expressed	Relative pronoun 'who' refers to plural 'boys'. Verb 'has expressed' is singular.	Subject-Verb Agreement (Relative Pronoun)	Incorrect
(c) willingness for joining	'Willingness to join' or 'willingness in joining' are more standard. 'Willingness for joining' is less common.	Preposition Usage / Collocation	Less Standard (but (b) is the main error)
(d) the educational tour	Correctly functioning object phrase.	N/A	Correct

15. Answer: b

Explanation:

Identifying Grammatical Errors in Sentence Parts

This question asks us to identify the specific part of the given sentence that contains a grammatical mistake. We need to carefully examine each segment labeled (a), (b), (c), and (d).

Detailed Analysis of Sentence Segments

Let's break down the sentence and analyze each part:

- **Part (a): 'I may spend'**

This segment is grammatically sound. The modal verb 'may' correctly expresses possibility or permission, and 'spend' is the appropriate base form of the verb following 'may'.

- **Part (b): 'this summer vacations'**

This segment contains the grammatical error. The word 'vacations' is plural. However, the phrase 'this summer' refers to a single, specific period of time. In standard English, when referring to one specific holiday period, the singular form 'vacation' is used. For example, we usually say '*this summer vacation*' or '*my vacation*', not '*my vacations*' unless referring to multiple distinct holiday periods. Therefore, the plural 'vacations' is incorrect here.

- **Part (c): 'with one of my friends'**

This segment is grammatically correct. It correctly uses the preposition 'with' to indicate accompaniment and follows it with the standard phrase 'one of my friends'.

- **Part (d): 'in the backwaters of Kerala'**

This segment correctly indicates the location using the preposition 'in' and specifies the place 'the backwaters of Kerala'. There are no grammatical errors here.

Explanation of the Grammatical Error

The error identified is in **part (b)** due to the incorrect use of the plural noun 'vacations'.

- The determiner 'this' points to a specific, singular instance.
- 'Summer' identifies the particular time period.
- The noun 'vacation' should correspond to this singular reference. The correct form is 'vacation'.
- The correct phrasing should be 'this summer **vacation**'.

Corrected Sentence

By correcting the error in part (b), the sentence should read:

"I may spend **this summer vacation** with one of my friends in the backwaters of Kerala."

Final Conclusion

The segment with the grammatical error is **(b) 'this summer vacations'**, as it incorrectly uses the plural form 'vacations' when the singular 'vacation' is required for the specific time period indicated.

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16. Answer: d

Explanation:

Choosing the Correct Weather Terminology

The question asks us to select the most suitable word to complete the sentence: "According to the weather _____ it is going to be cloudy today." This requires understanding the specific meaning of different words related to weather information.

Analyzing Word Choices for Weather Descriptions

Let's look at the provided options and how they relate to weather information:

- **Announcement:** This refers to a public statement or declaration. While weather updates might be announced, it's not the specific term for the prediction itself.
- **Indication:** This means a sign or suggestion. An indication might hint at future weather, but it's generally less precise and formal than what's needed here.
- **Prediction:** This is a general term for saying what you think will happen in the future. While a weather prediction is accurate, there's a more specialized term commonly used for weather.
- **Forecast:** This is a specific term used for predicting future events, particularly the weather. A weather forecast is based on scientific data and analysis.

Determining the Most Effective Word

The sentence describes an expectation about the weather for the day ("it is going to be cloudy today"). The most appropriate and standard term used in meteorology and common language for such a prediction is **Forecast**. A weather **forecast** provides details about expected conditions like temperature, rain, and cloud cover.

Therefore, the sentence "According to the weather **forecast**, it is going to be cloudy today" is the most meaningful and contextually correct completion.

Final Selection for the Weather Sentence

Comparing the options, **Forecast** is the most precise word to describe the source of information about future weather conditions, making it the most effective choice to complete the sentence meaningfully.

17. Answer: b

Explanation:

Understanding the Sentence Context: Villagers' Reaction to a Leader's Murder

The sentence describes a strong reaction by villagers following the **murder** of their leader. The specific action mentioned, "burning the police van," indicates a forceful and likely retaliatory response. We need to select the word that best describes this action in relation to the **murder**.

Choosing the Most Effective Word for the Sentence

The goal is to find the single word that accurately and powerfully completes the sentence: "The villagers _ _ _ _ the murder of their leader by burning the police van." Let's examine the meaning of each option:

- **Protested:** This word means to express objection or disapproval. While burning a police van is a form of protest, it implies a much stronger and more violent reaction than the word 'protested' typically conveys on its own. Protests are often public demonstrations expressing dissent.
- **Avenged:** This word means to inflict harm or punishment in return for an injury or wrong. Burning a police van as a response to a leader's murder suggests the villagers were seeking retribution or revenge for the killing. This aligns perfectly with the meaning of 'avenged'.
- **Mourned:** This word means to feel or express sorrow or grief. Mourning typically involves showing sadness, perhaps through funerals or periods of remembrance. Burning a police van is an act of anger and retaliation, not grief.
- **Consoled:** This word means to provide comfort to someone in distress. The villagers are taking action themselves, not comforting others. Burning a vehicle is not an act of consolation.

Detailed Analysis of "Avenged"

The act of "burning the police van" is a violent act directed towards symbols or agents associated with authority, potentially seen as responsible for or unable to prevent the **murder**. This action is a form of retaliation. The word **avenged** specifically describes taking revenge or seeking justice through forceful means for a

wrong that has been committed. Therefore, **avenged** is the most fitting word to describe the villagers' actions in response to their leader's **murder**.

Why Other Options Are Less Suitable

- **Protested:** While the action is a protest, 'avenged' is more specific and captures the retaliatory nature implied by burning a police van. 'Protested' is too general and understated for such a violent act.
- **Mourned:** This is incorrect because the villagers' action is aggressive and retaliatory, not an expression of sadness or grief.
- **Consoled:** This is incorrect as the villagers are acting out violently, not offering comfort.

Considering the context of the villagers taking a violent retaliatory action (burning the police van) after their leader's **murder**, the word **avenged** is the most precise and effective choice to make the sentence meaningfully complete.

18. Answer: b

Explanation:

- The question asks us to select the most **effective word** to make the sentence "While on a routine flight, the aircraft was hit by a missile and ____ into flames" **meaningfully complete**.
- This involves understanding the context and choosing the word that best fits the idiom "____ into flames".

Understanding the Sentence Context

The sentence describes a specific event: an **aircraft**, during a normal **routine flight**, is struck by a **missile**. The second part of the sentence describes the immediate consequence of this impact, specifically concerning fire.

Analyzing Word Choices for "____ into Flames"

We need to find the verb that correctly and idiomatically completes the phrase "_____ into flames", describing the aircraft's reaction to the missile strike.

- **Fired:** The phrase "fired into flames" is not a standard English idiom. "Fired" usually relates to shooting projectiles or dismissal. It does not fit the context of something catching fire.
- **Burst:** The idiom "burst into flames" means to suddenly begin burning very intensely. This perfectly describes the rapid ignition of the **aircraft** after being hit by a **missile**.
- **Caught:** While "caught fire" is a correct idiom, "caught into flames" is grammatically incorrect and not standard usage. "Caught" implies being ignited, but the preposition "into" makes this option unsuitable here.
- **Engulfed:** The phrase "engulfed into flames" is grammatically incorrect. The correct idioms are "engulfed **by** flames" or "engulfed **in** flames", which mean to be completely surrounded by fire. While the aircraft might eventually be engulfed, "burst" describes the initial, sudden ignition caused by the missile strike more accurately.

Choosing the Most Effective Word

Comparing the options, "Burst" is the most suitable word. The phrase "burst into flames" idiomatically and accurately conveys the sudden and intense ignition of the **aircraft** immediately following the **missile** impact. It provides the most meaningful completion for the sentence, describing the fiery consequence of the event.

- Therefore, the most effective word is Burst.

19. Answer: b

Explanation:

Effective Word Selection for Sentence Completion

The task is to select the most suitable word to fill in the blank in the given sentence, ensuring it becomes meaningful and contextually correct. The sentence describes a

situation where an employee, Hair, received a company car at a specific price due to his status as the senior-most employee.

Analyzing Sentence Context

The core of the sentence is: "Hair got the company car for a _____ price as he was the senior-most employee in the company." The phrase "as he was the senior-most employee" provides the reason for the pricing. This reason suggests that the price offered was preferential or lower than usual, acting as a benefit for his long service or position.

Evaluating Word Options

Let's examine each option to determine the best fit:

- **Reduced Price:** The word 'reduced' means made smaller or less in amount. While a discounted price is indeed reduced, 'reduced' is a more general term. It fits the context but might not be the most precise word used in commercial or employee benefit scenarios.
- **Discounted Price:** 'Discounted' specifically means that the price has been lowered from its usual or original price, often as a special offer, incentive, or benefit. Given that Hair received the car due to his senior position, a 'discounted' price directly implies a favorable reduction from the standard price, making it a strong fit for the context of employee perks.
- **Fixed Price:** The word 'fixed' means set or unchanging. A fixed price doesn't necessarily imply it's low or preferential; it just means it's set. This option doesn't align with the reason provided (seniority).
- **Nominal Price:** 'Nominal' refers to a price that is very small, often symbolic, or far below the actual value. While it indicates a low price, it might imply an almost negligible cost, which may not accurately represent the intended meaning compared to a specific reduction from the usual cost. 'Discounted' better captures the idea of a calculated price reduction offered as a benefit.

Choosing the Most Effective Word

Comparing the options, 'Discounted' most effectively conveys the intended meaning. The sentence implies that Hair received a special price reduction on the company car because he was the senior-most employee. This kind of price reduction is commonly referred to as a discount, often given as part of employee benefits or recognition for service. Therefore, 'discounted price' is the most appropriate and specific term to complete the sentence meaningfully.

20. Answer: c

Explanation:

Selecting the Best Word for Sentence Completion

This question requires us to identify the most suitable word to fill the blank in the sentence: "The unruly behaviour of the soldiers _____ their commander." The goal is to make the sentence grammatically correct and semantically meaningful, reflecting a likely reaction to the soldiers' conduct.

Understanding the Sentence Context

The core of the sentence revolves around the "unruly behaviour" of soldiers and its impact on their "commander". "Unruly behaviour" suggests actions that are disorderly, undisciplined, or defiant. Such behaviour typically elicits a strong response from a person in authority, like a commander.

Analyzing Word Choices for the Blank

We need a verb that accurately describes the commander's reaction or state resulting from the soldiers' misbehaviour. Let's examine each option:

Evaluating Option 1: 'Clashed'

The word 'Clashed' means to disagree strongly or to come into conflict. While the soldiers' behaviour might lead to a clash or conflict, using 'clashed' here would imply the behaviour itself was in conflict with the commander, which is less direct than

describing the commander's reaction. For example, "The soldiers' behaviour clashed with military regulations" makes sense, but "The behaviour clashed their commander" is awkward and doesn't clearly convey the intended meaning.

Evaluating Option 2: 'Aggrieved'

'Aggrieved' means feeling resentment because of unfair treatment. While a commander might feel wronged by insubordination, this word focuses more on a sense of personal injustice. It doesn't necessarily capture the strong anger or displeasure that undisciplined behaviour often provokes in a leader. It's a possible reaction, but perhaps not the most direct or common one described.

Evaluating Option 3: 'Incensed'

'Incensed' means extremely angry or enraged. This word directly addresses the likely emotional response of a commander faced with the "unruly behaviour" of their soldiers. It strongly conveys that the behaviour made the commander very angry, fitting the context perfectly. The sentence would read: "The unruly behaviour of the soldiers **incensed** their commander."

Evaluating Option 4: 'Impeached'

'Impeached' is a formal term used typically for charging a public official with misconduct or treason. This is completely unrelated to a commander's reaction to soldiers' day-to-day behaviour. It involves a formal accusation and legal process, making it unsuitable for this sentence.

Determining the Most Effective Word

Comparing the options, 'incensed' is the most fitting word. It clearly and strongly describes the commander's state of extreme anger caused by the soldiers' unruly actions. 'Clashed' and 'aggrieved' are less precise, and 'impeached' is contextually incorrect.

21. Answer: d

Explanation:

Understanding Who Gave MK Gandhi the 'Mahatma' Title

Mohandas Karamchand Gandhi, fondly known as Mahatma Gandhi, was a pivotal leader in India's struggle for independence. The title "Mahatma," meaning "Great Soul" in Sanskrit, is an honorific deeply associated with him. Understanding the origin of this title helps appreciate the historical context and the respect Gandhi commanded.

Historical Context of the 'Mahatma' Title

The question asks to identify the prominent figure who bestowed the revered title "Mahatma" upon MK Gandhi. This title signifies profound respect and recognition of Gandhi's spiritual and political leadership.

Analyzing the Figures Associated with Gandhi

Several key figures were contemporaries and associates of Mahatma Gandhi during India's freedom movement. Let's look at the options:

- **Sardar Patel:** Vallabhbhai Patel was a close associate and a leading figure in the Indian National Congress, playing a crucial role in integrating princely states into India. However, he is not credited with giving Gandhi the "Mahatma" title.
- **Jawaharlal Nehru:** India's first Prime Minister, Jawaharlal Nehru, was a prominent leader of the independence movement and worked closely with Gandhi. While he held Gandhi in high esteem, the "Mahatma" title did not originate from him.
- **Sarojini Naidu:** A renowned poet and a key figure in the Indian independence movement, Sarojini Naidu was a close companion of Gandhi. Although she deeply respected Gandhi, historical records do not attribute the conferral of the "Mahatma" title to her.
- **Rabindranath Tagore:** A Nobel laureate, poet, philosopher, and a towering figure in Indian arts and literature, Rabindranath Tagore shared a significant intellectual and personal relationship with Mahatma Gandhi.

Identifying the Giver of the 'Mahatma' Title

The widely accepted account is that the title "Mahatma" was first given to Mohandas Karamchand Gandhi by the poet Rabindranath Tagore. This is believed to have happened around 1915 or later, possibly after Gandhi's success in the Champaran Satyagraha in 1917. Tagore used the title in correspondence and public references, popularizing its use. This honorific reflected Tagore's deep admiration for Gandhi's actions and his perceived spiritual stature.

22. Answer: b

Explanation:

Non-Cooperation Movement Start Year

The question asks for the specific year in which the Non-Cooperation Movement commenced. This movement was a pivotal chapter in India's journey towards independence from British rule.

The core idea behind the Non-Cooperation Movement was to withdraw Indian support from the British administration and institutions as a means of achieving Swaraj, or self-rule. It was largely spearheaded by Mahatma Gandhi and advocated for peaceful, non-violent methods.

Historical Context of the Non-Cooperation Movement

Key factors leading to the launch of the Non-Cooperation Movement included widespread discontentment with British policies, particularly following events like the Rowlatt Act and the Jallianwala Bagh massacre. The movement sought to paralyze the British government's functioning by boycotting legislative councils, law courts, schools, and foreign goods.

Identifying the Movement's Start Year

The Indian National Congress formally adopted the Non-Cooperation Movement at its special session in Calcutta in September **1920**. Following this, the movement gained significant momentum across the country throughout late 1920 and into 1921.

The year **1920** marks the official beginning of this nationwide campaign of civil disobedience and non-cooperation against the British Raj.

23. Answer: b

Explanation:

Understanding Medieval Education Restrictions

The question asks about the social groups who had access to education during the Middle Ages. This historical period saw a deeply stratified society where one's social standing largely determined their opportunities, including access to learning. Understanding the social structure is key to answering this question about **medieval education**.

Access to Education Based on Social Class in the Middle Ages

In the Middle Ages, education was not universally available. Access was significantly limited and primarily determined by caste and social roles. Let's examine the situation for each group mentioned:

- **Brahmans:** This group formed the priestly and scholarly class. Their traditional duties included performing religious rituals, studying sacred texts (like the Vedas), and teaching. Consequently, formal education, often centered around religious teachings and philosophy, was predominantly accessible to and carried out by Brahmans. They were the custodians of knowledge and literacy was a core part of their societal function.
- **Kshatriyas:** As the warrior and ruling class, Kshatriyas received training relevant to their roles, such as statecraft, administration, and warfare. While some might

have had access to certain forms of learning, especially related to governance and strategy, their education was generally less focused on the broad religious and scholarly pursuits characteristic of the Brahmins.

- **Peasants:** This group constituted the majority of the population and was primarily involved in agriculture and manual labor. The social structure of the Middle Ages did not prioritize formal education for peasants. Their lives revolved around physical work, and literacy or scholarly pursuits were considered unnecessary and largely inaccessible for them.
- **Shudras:** Occupying the lowest rung of the traditional social hierarchy, Shudras were primarily laborers and service providers. They faced significant restrictions, often being explicitly excluded from religious rituals and the study of sacred texts. Access to formal education was virtually non-existent for this group.

Why Education Was Confined to Brahmins

The **medieval education** system was intrinsically linked with religious institutions and scholarly traditions. Since Brahmins were tasked with preserving and interpreting religious scriptures and conducting rituals, they became the primary educators. Educational centers were often attached to temples or were residential schools (like Gurukuls) run by Brahmin scholars. The curriculum focused heavily on religious texts, philosophy, law, and rituals, knowledge considered essential for the priestly class and passed down through generations within their community. While other upper classes like Kshatriyas might have received some education relevant to their duties, the depth and breadth of scholarly learning were most concentrated within the Brahmin community, making education effectively **confined** to them in many respects.

Therefore, based on the social and religious structures prevalent during the Middle Ages, education was largely restricted to the **Brahmins**.

24. Answer: a

Explanation:

Ashoka's Role in Buddhism Spread to Sri Lanka

This question asks to identify the historical figure responsible for the propagation of **Buddhism** in **Sri Lanka**. Let's examine the contributions of the individuals mentioned in the options.

Analyzing the Historical Figures

To answer this, we need to understand the historical context of Buddhism and the roles played by these figures:

- **Ashoka:** Emperor Ashoka Maurya, who ruled from approximately 268 to 232 BCE, was a pivotal figure in the history of **Buddhism**. After the brutal Kalinga War, Ashoka embraced Buddhism and dedicated his life to its promotion. He sent missionaries across various regions, including Central Asia, Southeast Asia, and importantly, **Sri Lanka**. His son, Mahinda, and daughter, Sanghamitta, traveled to Sri Lanka and played a significant role in establishing Buddhism there, converting the local king and populace.
- **Mahavira:** Lord Mahavira is considered the 24th Tirthankara and the most important proponent of **Jainism**. His teachings form the foundation of Jain philosophy. He lived around the same period as the Buddha but founded Jainism, not Buddhism.
- **Parshvanatha:** Parshvanatha was the 23rd Jain Tirthankara, who preceded Mahavira. He is a significant figure in **Jainism** but has no connection with the spread of **Buddhism**.
- **Chandra Gupta Maurya:** Chandra Gupta Maurya was the founder of the Mauryan Empire and the grandfather of Ashoka. Historical sources suggest he had leanings towards **Jainism** and later established a Hindu dynasty. While he laid the foundation for the empire that Ashoka inherited, he was not directly involved in the spread of **Buddhism**, particularly to **Sri Lanka**.

Conclusion on Buddhism's Spread

Based on historical records, Emperor Ashoka's patronage and missionary efforts, including sending his own children to the island, were directly responsible for the

introduction and establishment of **Buddhism** in **Sri Lanka**. The other figures listed are associated with Jainism or unrelated to the specific event of Buddhism spreading to Sri Lanka.

Key Takeaways:

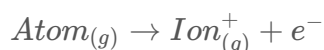
- Emperor Ashoka is widely credited with spreading **Buddhism**.
- Ashoka sent missionaries, including his son Mahinda and daughter Sanghamitta, to **Sri Lanka**.
- Mahavira and Parshvanatha are key figures in **Jainism**.
- Chandra Gupta Maurya founded the Mauryan Empire but is not linked to the spread of **Buddhism** to **Sri Lanka**.

25. Answer: b

Explanation:

Understanding Ionization Potential and Chemical Behavior

The **ionization potential** (or ionization energy) is defined as the minimum energy required to remove the most loosely bound electron from a neutral atom in its gaseous state. It can be represented as:



A **low ionization potential** signifies that an atom can lose its electron(s) easily with minimal energy input. Elements that exhibit this characteristic have a strong tendency to donate electrons.

Nature of Elements with Low Ionization Potential

Elements with low ionization potential readily give up electrons to achieve a more stable electron configuration, often forming positive ions (cations). This electron-donating ability is a key characteristic defining their chemical reactivity.

Role as Reducing Agents

In chemical reactions, a **reducing agent** is a substance that loses electrons. By losing electrons, it causes another substance to gain electrons (i.e., undergo reduction). The process where a substance loses electrons is called oxidation.

Therefore, elements that can easily lose electrons due to their low ionization potential act as effective electron donors and are classified as strong **reducing agents**. They readily get oxidized themselves while reducing other substances.

Analysis of Provided Options

- **Option 1: Oxidising agents** – This is incorrect. Oxidizing agents are substances that tend to gain electrons (requiring high ionization potential or electron affinity) and cause oxidation in other substances.
- **Option 2: Reducing agents** – This is the correct classification. Elements with low ionization potential easily lose electrons, making them strong electron donors and thus, strong **reducing agents**.
- **Option 3: Oxidising and Reducing agents depending upon the reactants** – While the overall role in a specific reaction depends on the reactant, the fundamental property associated with low ionization potential is the tendency to donate electrons, characterizing them primarily as reducing agents.
- **Option 4: none of these** – This is incorrect because Option 2 accurately describes the nature of elements with low ionization potential.

Conclusion

Elements characterized by a **low ionization potential** possess a strong tendency to lose electrons. This electron-donating capability defines them as potent **reducing agents** in chemical reactions.

26. Answer: d

Explanation:

Wayne Rooney's Country of Origin Explained

This solution details the country of origin for the famous footballer, Wayne Rooney, based on the provided options.

Who is Wayne Rooney?

Wayne Rooney is a highly celebrated professional footballer and former player, widely regarded as one of the greatest players of his generation. He is renowned for his time playing for prominent clubs like Manchester United and Everton, as well as representing his national team.

Analyzing the Options

The question asks about the country Wayne Rooney hails from. Let's examine the options:

- **Italy:** While a major footballing nation, Italy is not Wayne Rooney's home country.
- **Brazil:** Brazil is famous for its football legends, but Wayne Rooney is not Brazilian.
- **Argentina:** Argentina has produced iconic footballers, but it is not Wayne Rooney's country of origin.
- **England:** This option correctly identifies Wayne Rooney's nationality.

Wayne Rooney's Nationality

Wayne Rooney was born on 24 October 1985 in Liverpool, England. He is English by birth and nationality.

His entire professional football career, from his debut with Everton to his long and successful spell with Manchester United and his captaincy of the England national team, is deeply rooted in England. He holds the record for being England's all-time leading goalscorer.

Therefore, Wayne Rooney, the famous footballer, hails from **England**.

27. Answer: c

Explanation:

FIFA World Cup 2010: The "Waka Waka" Singer

This question asks to identify the popular singer who performed the official song for the 2010 FIFA World Cup, which was held in South Africa. The song is famously known as "Waka Waka (This Time for Africa)".

Identifying the "Waka Waka" Singer

The song "Waka Waka (This Time for Africa)" became an international hit and is strongly associated with the 2010 FIFA World Cup. Let's explore the options provided to determine the correct artist.

- Madonna is a famous pop icon, but she did not perform the 2010 World Cup theme song.
- Destiny's Child was a popular R&B group, but they were not involved with the "Waka Waka" song.
- Shakira is a globally renowned Colombian singer-songwriter.
- Rihanna is a celebrated Barbadian singer, but she did not sing the official 2010 FIFA World Cup song.

"Waka Waka" Song Performance Details

The song "Waka Waka (This Time for Africa)" was officially chosen as the theme song for the 2010 FIFA World Cup. The vibrant track was performed by the acclaimed Colombian singer Shakira. She co-wrote the song with the South African group Freshlyground, adding a distinct African flavour to the global hit. The song was a massive success, topping charts worldwide and becoming synonymous with the historic event in South Africa.

Therefore, the popular singer associated with the 2010 FIFA World Cup's official song, "Waka Waka", is Shakira.

28. Answer: b

Explanation:

Saina Nehwal Badminton Award in 2010

This question asks about the specific sports award given to the famous Indian badminton player, Saina Nehwal, during the year 2010.

Understanding Saina Nehwal's Achievements

Saina Nehwal is a highly accomplished athlete in the world of badminton. She has achieved significant success both nationally and internationally. It is important to pinpoint the exact award she received in 2010.

Examining the Award Options

Let's look at each option to determine the correct sports award:

- **Dronacharya Award:** This award is exclusively given to coaches for their exceptional work in training athletes and contributing to sports development. Since Saina Nehwal is an athlete, this award is not applicable to her.
- **Rajiv Gandhi Khel Ratna Award:** This is recognized as India's highest honor for athletes, acknowledging outstanding achievements in sports. Saina Nehwal was indeed honored with this prestigious award.
- **Arjun Award:** This award is presented to athletes for outstanding performance in sports. Saina Nehwal received the Arjun Award, but it was in 2009, not 2010.
- **None of these:** As one of the options correctly identifies the award, this choice is incorrect.

Saina Nehwal's 2010 Award Confirmation

In the year 2010, Saina Nehwal was honored with the **Rajiv Gandhi Khel Ratna Award**. This award recognizes her remarkable achievements and contributions to the sport of badminton and is considered the highest sporting honor in India.

It is worth noting that Saina Nehwal received other honors as well. She was awarded the Padma Shri (a civilian award) in 2010 and the Arjun Award in 2009. However, the question specifically asks for the *sports award* she received in 2010, which is the Rajiv Gandhi Khel Ratna Award.

Conclusion on the Sports Award

Based on the timeline and the nature of the awards, the correct sports award conferred upon Saina Nehwal in 2010 was the Rajiv Gandhi Khel Ratna Award.

29. Answer: c

Explanation:

Defining the Visible Horizon in Astronomy

The term "Visible Horizon" is a fundamental concept in astronomy, representing the apparent line that separates the Earth's surface from the sky. Understanding this definition is crucial for comprehending celestial observations and navigation.

Understanding the Key Components

To grasp the definition of the visible horizon, let's break down the terms used in the options:

- **Point of Observation:** This refers to the specific location from where an observer is viewing the celestial sphere or the Earth's surface. The horizon is relative to this viewpoint.
- **Cone of Visual Rays:** Imagine lines extending outwards from the observer's eye in all directions. The "cone" relates to the boundary formed by these lines of sight as they are limited by the Earth's curvature.
- **Circle of Contact:** This is the circular line formed on the Earth's surface where the observer's lines of sight become tangent to the curved surface. It marks the limit of what is visible from that specific observation point.

- **Meridian of the Place:** This is a specific geographical line passing through the North and South poles and the observer's location. While important in astronomy for tracking celestial bodies, it doesn't define the visible horizon itself.

Analyzing the Options for Visible Horizon

Let's evaluate each option in the context of the definition:

- **Option 1:** States the circle of contact involves visual rays passing through the *meridian of the place*. The horizon is not restricted to the meridian; it forms a circle around the observer.
- **Option 2:** Similar to option 1, this incorrectly links the horizon definition to the meridian instead of the observer's specific location.
- **Option 3:** Defines the horizon as the circle of contact involving visual rays passing through the *point of observation*. Since the visual rays originate from the observer's location (the point of observation), this correctly describes the boundary relevant to the observer.
- **Option 4:** Mentions visual rays not passing through the point of observation. This is contradictory, as the horizon is defined by the limits of vision *from* that point.

The Correct Definition of Visible Horizon

The **Visible Horizon** is precisely defined as the **circle of contact of the earth and the cone of visual rays passing through the point of observation**. This means it's the boundary seen by an observer at a specific location, determined by the Earth's curvature limiting the lines of sight originating from that very spot.

Essentially, the visible horizon is the limit of our vision on Earth, determined by where our line of sight becomes tangent to the planet's surface from our unique vantage point.

30. Answer: d

Explanation:

The question asks for the full form of the acronym **NREGA**.

Understanding NREGA: Key Concepts

NREGA is a crucial piece of social legislation and labor law in India. It was enacted to strengthen rural livelihoods. The primary goal is to provide at least 100 days of guaranteed wage employment to every rural household whose adult members volunteer to do unskilled manual work.

Analyzing the Options for NREGA's Full Form

Let's examine the given options to determine the correct expansion of **NREGA**:

- **Option 1: National Revenue Engagement Guarantee Association** – This option is incorrect. **NREGA** does not primarily focus on 'Revenue Engagement' and uses 'Act', not 'Association'.
- **Option 2: National Revenue Employment Guarantee Act** – This is incorrect because the scheme specifically targets the **Rural** sector, not just general 'Revenue'.
- **Option 3: National Rural Employment Guarantee Association** – This is incorrect because **NREGA** is an 'Act' of Parliament, not an 'Association'.
- **Option 4: National Rural Employment Guarantee Act** – This option correctly identifies the key components: 'National', 'Rural', 'Employment', 'Guarantee', and 'Act'. This aligns with the official name and purpose of the scheme.
- **Option 5: (No text provided)** – This option is incomplete.

Confirming the Correct Meaning of NREGA

The correct expansion of **NREGA** is indeed **National Rural Employment Guarantee Act**. This act was later renamed the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) in 2009. The core focus remains on guaranteeing employment in rural areas.

Therefore, the most accurate answer representing the original acronym **NREGA** is **National Rural Employment Guarantee Act**.

31. Answer: c

Explanation:

River Sutlej Origin Explained

The question asks about the geographical source of the River Sutlej. Identifying the correct origin point is crucial for understanding the river's course and its significance in the region.

Tracing the River Sutlej's Source

The **River Sutlej**, also known as Sutlej or Satadru, is one of the five tributaries of the Indus River. It is a significant river flowing through India and Pakistan. Its journey begins high in the Himalayas.

The primary source of the **River Sutlej** is located near the border of India and China (Tibet Autonomous Region). Specifically, it originates from the:

- **Rakshastal Lake:** This is a large, naturally perennial lake in southwestern Tibet. The river emerges from the southwestern side of this lake. Rakshastal Lake is situated at a high altitude, approximately 4,574 meters (15,001 feet) above sea level. It is believed to be the specific source of the Sutlej River.

Analyzing Other Potential Origins

Let's look at why the other options are incorrect locations for the **River Sutlej's origin**:

- **Northern slopes of the Kailash range:** While the Kailash range is geographically close to Rakshastal Lake and influences the region's hydrology, the river itself emerges directly from the lake, not the slopes in general.

- **Spring at Verinag:** The spring at Verinag is famously known as the source of the Jhelum River, another major river in the Indus basin, not the Sutlej.
- **Amarkantak plateau:** This plateau in central India is significant as the origin point for major peninsular rivers like the Narmada and the Son River, which flow in different directions and basins than the Sutlej.

Key River Origins Summary

Here is a summary table highlighting the origins of the rivers mentioned:

River	Origin	Geographical Region
Sutlej	Rakshastal Lake	Tibet Autonomous Region (near Kailash Range)
Jhelum	Spring at Verinag	Jammu and Kashmir, India
Narmada	Amarkantak Plateau	Madhya Pradesh, India
Son	Amarkantak Plateau	Madhya Pradesh, India

Conclusion on Sutlej's Source

Based on geographical evidence and common knowledge regarding Indian rivers, the **River Sutlej originates from Rakshastal Lake** in Tibet. This location is distinct from the other options provided, making it the correct answer.

32. Answer: a

Explanation:

Limonite: An Important Ore of Iron

Limonite is a term used for a group of minerals composed of **hydrated iron(III) oxides**. It's not a single mineral with a fixed chemical formula, but rather a mixture. Its general formula is often written as $\text{Fe}_2\text{O}_3 \cdot n\text{H}_2\text{O}$, indicating the presence of iron

oxide along with a variable amount of water. Limonite typically appears as a yellow, brown, or reddish-brown earthy material.

Understanding Limonite as an Iron Source

The key characteristic of limonite is that it contains significant amounts of iron. Consequently, it is classified as an **iron ore**. Throughout history and continuing today, limonite has been mined and processed to extract iron metal, which is essential for making steel and various other products. The iron content can vary, but it is concentrated enough to be economically valuable as a raw material.

Limonite in Relation to Other Iron Ores

It's useful to know that limonite is one of several important ores from which iron is extracted. Other common iron ores include:

- Hematite (chemical formula: Fe_2O_3)
- Magnetite (chemical formula: Fe_3O_4)
- Siderite (chemical formula: FeCO_3)

Limonite often forms from the weathering or alteration of these other iron minerals.

Why Limonite is Not an Ore of Other Metals

The question asks which metal's ore Limonite is. Based on its composition and common usage in metallurgy, Limonite is exclusively associated with **Iron**. The other options provided are incorrect because:

- Aluminium is primarily obtained from Bauxite ore.
- Zinc is typically extracted from ores like Sphalerite (also known as Zinc Blende).
- Cobalt is sourced from minerals such as Cobaltite or Skutterudite.

Therefore, Limonite serves as a valuable ore for the metal **Iron**.

33. Answer: c

Explanation:

Understanding the Black Revolution

The question asks about the association of the **Black Revolution** with different sectors of production and self-dependence. Several "revolution" terms are used in India to denote significant advancements in specific industries. Understanding these helps identify the correct sector for the **Black Revolution**.

What is the Black Revolution?

- The **Black Revolution** typically refers to the advancements and increased output in the **petroleum** sector, particularly crude oil production and processing.
- It signifies efforts towards achieving self-sufficiency in meeting the nation's energy needs derived from petroleum products.
- The term highlights the importance of crude oil, often called "black gold," in powering industries and transportation.

Connecting Black Revolution to Petroleum Production

Given the options, let's analyze the connection:

- **Option 1: Self-dependence in foodgrains production** – This is famously associated with the **Green Revolution**, which focused on increasing food production through high-yield variety seeds, fertilizers, and modern farming techniques.
- **Option 2: Self-dependence in milk production** – This relates to the **White Revolution** (Operation Flood), which aimed at increasing milk availability and dairy farming efficiency.
- **Option 3: Self-dependence in petroleum/ crude oil** – This aligns directly with the concept of the **Black Revolution**, focusing on the growth and self-reliance within the **petroleum** industry.
- **Option 4: None of these** – This option is incorrect as the **Black Revolution** is linked to a specific sector.

Analysis of Other Related Revolutions

It's helpful to distinguish the **Black Revolution** from other known agricultural and industrial movements:

- **Green Revolution:** Focused on food grains (like wheat and rice).
- **White Revolution:** Focused on milk production and dairy.
- **Yellow Revolution:** Focused on oilseeds production.
- **Blue Revolution:** Focused on fish production.
- **Pink Revolution:** Focused on production of onions and prawns.

The **Black Revolution** stands distinct by concentrating on **petroleum** and crude oil.

Conclusion on Black Revolution

The **Black Revolution** directly relates to achieving self-sufficiency in the production and processing of **petroleum** and crude oil. Therefore, the option highlighting this sector is the correct association.

34. Answer: b

Explanation:

Karrar Unmanned Bomber Aircraft Origin Explained

This solution explains the origin of the unmanned bomber aircraft known as Karrar, based on the provided options.

Understanding the Karrar Aircraft

The Karrar is a significant development in unmanned aerial vehicle (UAV) technology, specifically designed as an unmanned combat aerial vehicle (UCAV) or bomber. It represents a capability for strategic reconnaissance and strike missions without risking a pilot.

Analyzing the Karrar's Country of Origin

To determine the correct answer, we need to identify which country developed and operates the Karrar unmanned bomber aircraft.

- **Karrar Aircraft Development:** The Karrar UAV was publicly unveiled by Iran's Islamic Revolutionary Guard Corps (IRGC) Aerospace Force. It is recognized as Iran's first long-range, high-speed drone capable of carrying munitions, making it a bomber-capable UAV.
- **Option Evaluation:**
 - **Iraq:** While Iraq operates various UAVs, the Karrar is not primarily associated with its development or primary operation.
 - **Iran:** This option aligns with the known information about the Karrar UAV's origin and development by Iran.
 - **Turkey:** Turkey has its own advanced UAV programs (like the Bayraktar series), but the Karrar is not one of them.
 - **Pakistan:** Pakistan also has a UAV program, but the Karrar is not part of its indigenous drone fleet.

Conclusion on Karrar Aircraft Nationality

Based on public disclosures and military analysis, the Karrar unmanned bomber aircraft is an indigenous product of **Iran**. It was developed and first displayed by Iranian military forces, highlighting Iran's advancements in drone technology for combat purposes.

Therefore, the correct option is **Iran**.

35. Answer: d

Explanation:

Author of 'Keeping the Faith: Memoirs of Parliamentarian'

This section identifies the author behind the book titled '**Keeping the Faith: Memoirs of Parliamentarian**'. This work serves as a personal account of a political figure's journey through parliamentary life.

Identifying the Book's Author

The author of the book '**Keeping the Faith: Memoirs of Parliamentarian**' is **Somnath Chatterjee**.

Somnath Chatterjee's Contribution

Somnath Chatterjee was a prominent Indian politician and a respected parliamentarian. He notably served as the Speaker of the Lok Sabha, India's lower house of parliament, from 2004 to 2009. His extensive experience in legislative affairs and parliamentary procedures forms the core content of his memoirs. The book, '**Keeping the Faith: Memoirs of Parliamentarian**', delves into his political career, offering reflections and insights gathered over decades of service. It provides readers with a firsthand look at the workings of parliament and the challenges and triumphs faced by lawmakers.

Key Information Summary

- **Book Title:** Keeping the Faith: Memoirs of Parliamentarian
- **Author:** Somnath Chatterjee

Knowing the authors of significant political memoirs like this helps in understanding the historical context and the personal viewpoints shaping political narratives.

36. **Answer: a**

Explanation:

Thyroid Hormone and Calcium Balance Explained

This question asks to identify the specific **thyroid hormone** that plays a crucial role in regulating the **balance of calcium** within the human body. Understanding the functions of hormones produced by the thyroid gland is key to answering this question correctly.

Understanding Calcium Regulation in the Body

Calcium (Ca^{2+}) is a vital mineral essential for numerous bodily functions, including:

- Bone and teeth structure
- Muscle contraction
- Nerve impulse transmission
- Blood clotting

The body tightly controls the concentration of calcium in the blood and extracellular fluid. Hormones like parathyroid hormone (PTH) and calcitonin are the primary regulators of this balance.

Analyzing the Role of Thyroid Hormones

Let's examine the functions of the hormones mentioned in the options:

Calcitonin Function

- **Source:** Calcitonin is a hormone produced by the parafollicular cells (also known as C cells) located within the **thyroid gland**.
- **Role in Calcium Balance:** Calcitonin's main function is to reduce blood calcium levels when they become too high (hypercalcemia). It acts primarily by:
 - Inhibiting the activity of osteoclasts, which are cells responsible for breaking down bone tissue and releasing calcium into the bloodstream.
 - Increasing the excretion of calcium by the kidneys.
- **Conclusion:** Calcitonin directly participates in controlling the **balance of calcium** and originates from the **thyroid gland**.

Thyroxine Function

- **Source:** Thyroxine (T4) is one of the main hormones produced by the follicular cells of the **thyroid gland**.
- **Role in Calcium Balance:** Thyroxine primarily regulates the body's metabolic rate. While overall metabolism influences nutrient absorption and utilization, including calcium, it does not act as a primary regulator for short-term calcium balance in the way calcitonin does. Its role is more related to long-term bone growth and turnover.

Calmodulin Function

- **Nature:** Calmodulin is a protein, not a hormone produced by the thyroid gland.
- **Role in Calcium Balance:** It acts as an intracellular calcium-binding protein. When intracellular calcium levels rise, calmodulin binds to calcium ions and subsequently activates or modifies the function of various target enzymes and proteins within the cell. It is a calcium **messenger** inside cells, not a regulator of overall body calcium levels.

Identifying the Correct Thyroid Hormone

Based on the analysis:

- Calcitonin is a **thyroid hormone** that directly regulates **calcium balance** by lowering blood calcium levels.
- Thyroxine is a **thyroid hormone** but primarily regulates metabolism, not direct calcium balance control.
- Calmodulin is a calcium-binding protein, not a **thyroid hormone**.

Therefore, Calcitonin is the hormone that fits the description provided in the question.

37. Answer: c

Explanation:

Plant Cell Wall Pores and Cytoplasmic Strands

Plant cells are characterized by the presence of a rigid cell wall located outside the plasma membrane. This cell wall provides structural support and protection. However, for essential processes like transport and communication between adjacent cells, the cell wall must allow connections. The question describes specific narrow openings, or pores, within this plant cell wall. These pores contain fine strands of cytoplasm that serve to interconnect the contents of neighboring cells.

Defining the Channels Linking Plant Cells

The structures that fit this description are known as **Plasmodesmata**. These are unique cytoplasmic channels that pass through the cell walls separating adjacent plant cells. They are crucial for maintaining continuity between the cytoplasm of these cells.

Key characteristics of **Plasmodesmata** include:

- They act as channels that perforate the cell walls of neighboring plant cells.
- These channels are filled with cytoplasm and contain a desmotubule (a tubule derived from the smooth endoplasmic reticulum), allowing for the direct movement of water, ions, nutrients, and signaling molecules between cells.
- The presence of **Plasmodesmata** enables efficient transport and communication, facilitating coordinated growth and function within plant tissues.
- The channels themselves are lined by the plasma membrane, which is continuous with the plasma membranes of the connected cells.

Comparison with Other Cellular Structures

To understand why **Plasmodesmata** is the correct answer, let's look at the other options:

- **Microvilli**: These are microscopic cellular projections found on the surface of some cells, typically in animal systems. They are extensions of the plasma membrane and serve to increase the surface area for absorption. They do not form channels through cell walls to connect adjacent cells.

- **Plasmalemma:** This term refers to the plasma membrane, which is the membrane surrounding the cytoplasm within a cell. While the plasma membrane is involved in forming the boundary of the plasmodesmatal channel, the plasmalemma itself is the membrane, not the channel connecting cells.
- **Plasmahole:** This term is not a standard or recognized biological term for the structures described in the question.

In summary, the narrow pores containing cytoplasmic strands that link the contents of adjacent plant cells through their cell walls are specifically termed **Plasmodesmata**.

38. Answer: b

Explanation:

This question asks to identify the specific Indian cricketer who was honored with an honorary commission in the Territorial Army.

Cricketer Kapil Dev's Territorial Army Commission

Kapil Dev, a legendary figure in Indian cricket and a former captain, holds a unique distinction among the cricketers listed. He is widely recognized for his leadership in India's 1983 Cricket World Cup victory.

Understanding the Territorial Army

The Territorial Army (TA) is a voluntary, second line of defense available to the country. It is a part of the Indian Army but operates on a part-time basis, allowing civilians to participate in military activities. Members are called 'Citizen Soldiers'.

Honorary Commissions in the Army

An honorary commission is a rank granted to distinguished individuals who have contributed significantly to society, often in fields outside the military. It is a

ceremonial title and does not typically involve active military duties in the same way as a regular commissioned officer. It serves as a recognition of their stature and service.

Kapil Dev's Recognition

- In the year 2008, Kapil Dev was bestowed with an honorary commission in the rank of **Lieutenant Colonel** in the Territorial Army.
- This honor recognized his immense contribution to sports and his standing in the nation.
- He joined the ranks alongside other prominent personalities who have received similar honors, highlighting the integration of civilian excellence with military recognition.

Analysis of Options

While Sachin Tendulkar, Virendra Sehwag, and Harbhajan Singh are all renowned cricketers who have represented India with distinction, Kapil Dev is the one specifically associated with receiving an honorary commission in the Territorial Army.

39. Answer: c

Explanation:

Transport Phenomenon and Gas State

This question focuses on **transport phenomena** in gases, asking about the specific **state** they occur in and their nature (reversible or irreversible). Understanding these concepts is key to grasping how gases behave under different conditions.

Defining Transport Phenomena in Gases

Transport phenomena are processes involving the net movement of properties like mass, momentum, or energy through a gas. Common examples include:

- **Diffusion:** The movement of gas particles from an area of higher concentration to lower concentration.
- **Viscosity:** The internal friction in a gas, related to the transfer of momentum between layers moving at different speeds.
- **Thermal Conduction:** The transfer of heat energy through the gas due to temperature differences.

These phenomena are driven by gradients, such as concentration, velocity, or temperature gradients within the gas.

Transport Phenomenon and the Equilibrium State

The question specifies that transport phenomena occur only in a particular **state**. While the presence of gradients implies a deviation from perfect thermodynamic **equilibrium**, the correct description links these processes to the concept of equilibrium. Irreversible processes, including transport phenomena, are those that move a system towards equilibrium. They represent the natural direction of change, leading to a more uniform distribution of energy or matter. Therefore, these phenomena are considered in the context of a system evolving towards or characterized relative to the final **equilibrium** state.

The Irreversible Nature of Transport Processes

Transport phenomena are classified as **irreversible** processes. This classification stems from several key characteristics:

- **Finite Rate:** These processes occur at actual, measurable speeds, unlike hypothetical reversible processes that occur infinitely slowly.
- **Dissipation:** There is typically a loss or dissipation of energy. For example, viscosity converts kinetic energy into thermal energy.
- **Entropy Production:** Irreversible processes always increase the total entropy of the universe (system + surroundings). The rate of entropy generation ($\frac{dS_{gen}}{dt}$) is

positive for these processes ($\frac{dS_{gen}}{dt} > 0$). This reflects the system moving towards a more probable state (equilibrium).

For instance, heat naturally flows from hotter regions to colder regions, increasing overall entropy. This process does not spontaneously reverse itself.

Summary of Gas Transport Characteristics

Based on the analysis, transport phenomena in gases occur in a context related to the **equilibrium** state and are fundamentally **irreversible**.

40. Answer: d

Explanation:

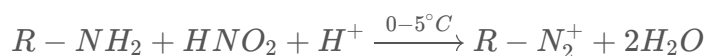
Amine Reactions with Nitrous Acid

The reaction between amines and nitrous acid (HNO_2) is a fundamental concept in organic chemistry, primarily used to distinguish between the three classes of amines: primary, secondary, and tertiary. Nitrous acid is typically prepared in the laboratory by reacting sodium nitrite ($NaNO_2$) with a strong acid like hydrochloric acid (HCl). Let's explore the distinct reactions each amine type undergoes with nitrous acid.

Primary Amines Reactivity with Nitrous Acid

Primary amines, represented generally as $R - NH_2$ (where R is an alkyl or aryl group), react with nitrous acid at cool temperatures, usually between $0^\circ C$ and $5^\circ C$. This reaction is known as **diazotization**. It leads to the formation of diazonium salts ($R - N_2^+$).

The chemical equation for this transformation is:



Aromatic diazonium salts ($Ar - N_2^+$) are important intermediates in synthesis,

particularly for making dyes, and are stable enough in cold aqueous solutions. Aliphatic diazonium salts, however, are very unstable and decompose rapidly.

Secondary Amines Reactivity with Nitrous Acid

Secondary amines, having the general structure R_2NH , react with nitrous acid to produce N-nitrosamines ($R_2N - N = O$). These products contain a nitroso group ($-N = O$) directly attached to the amine nitrogen atom.

The reaction is represented as:



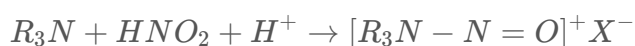
N-nitrosamines are often oily, yellow substances. Their formation serves as a characteristic chemical test for identifying secondary amines.

Tertiary Amines Reactivity with Nitrous Acid

Tertiary amines, with the general formula R_3N , react differently based on whether they are aliphatic or aromatic.

- **Aliphatic Tertiary Amines:** When treated with nitrous acid in an acidic medium, aliphatic tertiary amines form water-soluble nitrosoammonium salts.

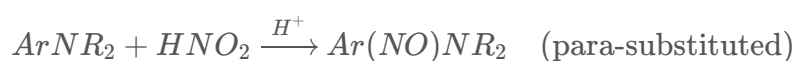
The reaction is shown below:



Here, X^- denotes the anion from the acid used.

- **Aromatic Tertiary Amines:** For aromatic tertiary amines ($ArNR_2$), the reaction with nitrous acid typically results in electrophilic aromatic substitution on the ring itself, especially if the ring is activated by electron-donating groups. This usually leads to the formation of p-nitroso derivatives.

The reaction for an activated aromatic ring is:



This introduces a nitroso group ($-NO$) onto the aromatic ring, usually at the para position.

Understanding Nitrite Formation from Amines

The question asks which types of amines form "nitrites" when reacted with nitrous acid. While the term 'nitrite' technically refers to salts of nitrous acid (e.g., $NaNO_2$), the reactions of amines with nitrous acid produce different compounds like diazonium salts, N-nitrosamines, and nitrosoammonium derivatives. These reactions all involve the chemistry of nitrous acid and often introduce a nitroso group ($-N=O$).

Given that primary, secondary, and tertiary amines all exhibit characteristic reactions with nitrous acid, and considering the options provided, the question likely uses the term "nitrites" in a broader sense to include the various products formed during these reactions. Therefore, all classes of amines are relevant in the context of reactions with nitrous acid.

41. Answer: b

Explanation:

Given:

The square of a number is equal to the difference of the square of 37 and 23

Formula Used:

$$a^2 - b^2 = (a + b)(a - b)$$

Calculation:

Let the number be x

According to the question

$$x^2 = 37^2 - 23^2$$

$$\Rightarrow x^2 = (37 + 23)(37 - 23)$$

$$\Rightarrow x^2 = 60 \times 14$$

$$\Rightarrow x = \sqrt{840} = 28.98$$

$\therefore$ The required value of the number is 28.98.

42. Answer: d

Explanation:

Understanding the Average Age Scenario

This problem involves finding the age of a new person joining a group, based on how the group's average age changes. We have a group of 8 men. Their average age increases by 4 years when one man, who is 30 years old, is replaced by a new man. We need to determine the age of this new man.

Calculating New Man's Age: Step-by-Step

Let's break down the problem to find the age of the new man.

- There are 8 men in the group.
- The average age increases by 4 years.
- This increase applies to all 8 men.
- The total increase in the sum of ages for the entire group is the number of men multiplied by the increase in average age.

Step 1: Calculate the total increase in age.

The increase in the average age is 4 years for each of the 8 men. So, the total increase in the sum of their ages is:

$$\text{Total Increase} = \text{Number of Men} \times \text{Increase in Average Age}$$

$$\text{Total Increase} = 8 \times 4 \text{ years} = 32 \text{ years}$$

This means the new total age of the group is 32 years more than the old total age, considering the replacement.

Step 2: Relate the total increase to the ages of the men involved.

The total increase of 32 years is the difference between the age of the new man and the age of the man who was replaced.

Let the age of the new man be ' A_{new} '.

The age of the man who was replaced is 30 years.

$$\text{Total Increase} = A_{new} - \text{Age of replaced man}$$

$$32 \text{ years} = A_{new} - 30 \text{ years}$$

Step 3: Calculate the age of the new man.

To find the age of the new man, we rearrange the equation from Step 2:

$$A_{new} = 32 \text{ years} + 30 \text{ years}$$

$$A_{new} = 62 \text{ years}$$

Therefore, the age of the new man is 62 years. This makes sense because the new man is older than the replaced man, causing the average age of the group to increase.

43. Answer: a

Explanation:

Weight of Empty Vessel Calculation

This question asks us to find the weight of an empty vessel. We are given the total weight of the vessel when it's full of water and when it's partially full. We need to determine the specific **weight** of the **empty vessel**.

Understanding the Weights Involved

To solve this, let's define the unknown quantities:

- Let W_v represent the weight of the empty vessel in kilograms (kg).
- Let W_w represent the weight of the water when the vessel is completely full, also in kilograms (kg).

Formulating Equations from the Problem Statement

The problem gives us two key pieces of information, which we can translate into mathematical equations:

1. **Vessel Full of Water:** When the vessel is full, its weight is the sum of the vessel's weight and the weight of the full water.

$$W_v + W_w = 24 \text{ kg} \quad (1)$$

2. **Vessel 1/4 Full of Water:** When the vessel contains water equal to one-fourth of its capacity, its weight is the sum of the vessel's weight and the weight of this partial amount of water. The weight of the water is now $\frac{1}{4}W_w$.

$$W_v + \frac{1}{4}W_w = 9 \text{ kg} \quad (2)$$

Calculating the Weight of the Water

We have a system of two linear equations with two variables (W_v and W_w). To find the weight of the empty vessel (W_v), we can first find the weight of the full quantity of water (W_w). A common method is to subtract one equation from the other to eliminate one variable.

Let's subtract Equation (2) from Equation (1):

$$(W_v + W_w) - (W_v + \frac{1}{4}W_w) = 24 \text{ kg} - 9 \text{ kg}$$

Simplify the equation:

$$W_v + W_w - W_v - \frac{1}{4}W_w = 15 \text{ kg}$$

The W_v terms cancel out, leaving:

$$W_w - \frac{1}{4}W_w = 15 \text{ kg}$$

Combine the W_w terms:

$$\left(\frac{4}{4} - \frac{1}{4}\right)W_w = 15 \text{ kg}$$

$$\frac{3}{4}W_w = 15 \text{ kg}$$

To solve for W_w , multiply both sides by $\frac{4}{3}$:

$$W_w = 15 \text{ kg} \times \frac{4}{3}$$

$$W_w = \frac{15}{3} \times 4 \text{ kg}$$

$$W_w = 5 \times 4 \text{ kg}$$

$$W_w = 20 \text{ kg}$$

This tells us that the weight of the water filling the vessel completely is 20 kg.

Finding the Weight of the Empty Vessel

Now that we know the weight of the full water ($W_w = 20 \text{ kg}$), we can substitute this value back into Equation (1) to find the weight of the empty vessel (W_v).

Using Equation (1):

$$W_v + W_w = 24 \text{ kg}$$

Substitute $W_w = 20 \text{ kg}$:

$$W_v + 20 \text{ kg} = 24 \text{ kg}$$

To find W_v , subtract 20 kg from both sides:

$$W_v = 24 \text{ kg} - 20 \text{ kg}$$

$$W_v = 4 \text{ kg}$$

So, the weight of the empty vessel is 4 kg.

Verification

Let's check our answer using the second condition:

$$\text{Weight of vessel} + \text{Weight of } 1/4 \text{ water} = W_v + \frac{1}{4}W_w$$

$$= 4 \text{ kg} + \frac{1}{4}(20 \text{ kg})$$

$$= 4 \text{ kg} + 5 \text{ kg}$$

$$= 9 \text{ kg}$$

This matches the information given in the problem.

Summary of Findings

The calculations confirm the weights:

Weight Breakdown

Component	Weight (kg)
Empty Vessel (W_v)	4
Water (Full Vessel) (W_w)	20
Total Weight (Full Vessel)	$4 + 20 = 24$
Total Weight (1/4 Full Vessel)	$4 + \frac{1}{4}(20) = 4 + 5 = 9$

The final answer for the weight of the empty vessel is 4 kg.

44. Answer: a

Explanation:

The problem requires finding the value of the expression $a^3 - b^3$ given specific values for $a - b$ and ab .

Identifying Given Information

From the question, we have the following information:

- The difference between a and b is 4: $a - b = 4$
- The product of a and b is 45: $ab = 45$

We need to calculate the value of $a^3 - b^3$.

Recalling the Relevant Algebraic Identity

To solve this, we can use the algebraic identity for the difference of cubes, which can be expressed in a way that utilizes the given values:

$$a^3 - b^3 = (a - b)^3 + 3ab(a - b)$$

This identity is useful because it directly incorporates the terms $(a - b)$ and ab , which are provided in the problem statement.

Step-by-Step Calculation

Now, we substitute the given values into the identity:

1. Substitute the value of $(a - b)$, which is 4:

$$(a - b)^3 = (4)^3$$

$$(4)^3 = 4 \times 4 \times 4 = 64$$

2. Substitute the values of ab (45) and $(a - b)$ (4) into the term $3ab(a - b)$:

$$3ab(a - b) = 3 \times 45 \times 4$$

$$3 \times 45 = 135$$

$$135 \times 4 = 540$$

3. Add the results from the two parts:

$$a^3 - b^3 = (a - b)^3 + 3ab(a - b)$$

$$a^3 - b^3 = 64 + 540$$

$$a^3 - b^3 = 604$$

Final Result

Therefore, the value of $a^3 - b^3$ is 604.

45. Answer: d

Explanation:

The problem asks us to find the value of the ratio $(a + b)/(a - b)$ given that $a/(a + b) = 15/21$.

Step-by-Step Solution

1. Simplify the Given Ratio

First, we simplify the given ratio:

$$\frac{a}{a + b} = \frac{15}{21}$$

Divide both the numerator and the denominator by their greatest common divisor, which is 3:

$$\frac{a}{a + b} = \frac{15 \div 3}{21 \div 3} = \frac{5}{7}$$

So, we have the simplified relationship:

$$\frac{a}{a + b} = \frac{5}{7}$$

2. Find the Relationship Between 'a' and 'b'

To find the relationship between **a** and **b**, we can cross-multiply the simplified ratio:

$$7 \times a = 5 \times (a + b)$$

$$7a = 5a + 5b$$

Now, rearrange the equation to isolate terms with **a** and **b**:

$$7a - 5a = 5b$$

$$2a = 5b$$

To find the ratio of **a** to **b**, divide both sides by **b** and then by 2:

$$\frac{2a}{b} = 5$$

$$\frac{a}{b} = \frac{5}{2}$$

This gives us the ratio **a:b = 5:2**.

3. Calculate the Target Ratio $(a + b)/(a - b)$

We need to find the value of $(a + b)/(a - b)$. We can use the ratio $a/b = 5/2$.

To use this ratio in the expression $(a + b)/(a - b)$, we can divide both the numerator and the denominator by **b** (assuming **b** is not zero):

$$\frac{a + b}{a - b} = \frac{\frac{a}{b} + \frac{b}{b}}{\frac{a}{b} - \frac{b}{b}}$$

$$\frac{a + b}{a - b} = \frac{\frac{a}{b} + 1}{\frac{a}{b} - 1}$$

Now substitute the value of $a/b = 5/2$ into the expression:

$$\frac{a + b}{a - b} = \frac{\frac{5}{2} + 1}{\frac{5}{2} - 1}$$

Calculate the numerator:

$$\frac{5}{2} + 1 = \frac{5}{2} + \frac{2}{2} = \frac{5 + 2}{2} = \frac{7}{2}$$

Calculate the denominator:

$$\frac{5}{2} - 1 = \frac{5}{2} - \frac{2}{2} = \frac{5-2}{2} = \frac{3}{2}$$

Now, divide the numerator by the denominator:

$$\frac{a+b}{a-b} = \frac{\frac{7}{2}}{\frac{3}{2}}$$

$$\frac{a+b}{a-b} = \frac{7}{2} \times \frac{2}{3}$$

$$\frac{a+b}{a-b} = \frac{7}{3}$$

4. Compare with Options

The calculated value is $\frac{7}{3}$. Let's check the given options:

- Option 1: $\frac{13}{9}$
- Option 2: $\frac{23}{11}$
- Option 3: $\frac{14}{5}$
- Option 4: $\frac{21}{9}$

We need to see which option is equivalent to $\frac{7}{3}$.

Simplify Option 4:

$$\frac{21}{9} = \frac{21 \div 3}{9 \div 3} = \frac{7}{3}$$

The value matches Option 4.

Conclusion

Based on the calculations, the value of $(a+b)/(a-b)$ is $\frac{7}{3}$, which corresponds to the ratio $\frac{21}{9}$.

46. Answer: c

Explanation:

Expression Simplification

The problem requires us to find the value of the following mathematical expression:

$$\frac{(798 + 579)^2 - (798 - 579)^2}{(798 \times 579)}$$

A direct computation involving squaring large numbers can be tedious. We can simplify this process by recognizing and applying a standard algebraic identity.

Algebraic Identity $(a + b)^2 - (a - b)^2$

A fundamental algebraic identity relates the difference of squares of a sum and difference to the product of the terms. This identity is very useful for simplifying expressions like the one given.

Consider the standard algebraic expansions:

- $(a + b)^2 = a^2 + 2ab + b^2$
- $(a - b)^2 = a^2 - 2ab + b^2$

Subtracting the second expansion from the first gives:

$$(a + b)^2 - (a - b)^2 = (a^2 + 2ab + b^2) - (a^2 - 2ab + b^2)$$

By distributing the negative sign to the terms in the second parenthesis:

$$= a^2 + 2ab + b^2 - a^2 + 2ab - b^2$$

Combining like terms (a^2 terms cancel, b^2 terms cancel):

$$= (a^2 - a^2) + (b^2 - b^2) + (2ab + 2ab)$$

$$= 0 + 0 + 4ab$$

$$= 4ab$$

This confirms the identity: $(a + b)^2 - (a - b)^2 = 4ab$.

Problem Application of Identity

We can relate the given expression to this algebraic identity by setting specific values for a and b . In this problem:

- Let $a = 798$
- Let $b = 579$

With these assignments, the expression $\frac{(798 + 579)^2 - (798 - 579)^2}{(798 \times 579)}$ perfectly matches the form $\frac{(a+b)^2 - (a-b)^2}{a \times b}$.

Step-by-Step Fraction Calculation

Now we substitute the identity $(a + b)^2 - (a - b)^2 = 4ab$ into the numerator of our expression:

The expression simplifies to:

$$\frac{4ab}{a \times b}$$

Substitute the specific values $a = 798$ and $b = 579$ back into this simplified form:

$$\frac{4 \times 798 \times 579}{798 \times 579}$$

Since the term 798×579 is present in both the numerator and the denominator, and it is not zero, we can cancel it out.

$$\frac{4 \times \cancel{798} \times \cancel{579}}{\cancel{798} \times \cancel{579}} = 4$$

Result Comparison

The calculation using the algebraic identity shows that the value of the given expression is 4.

We check this result against the multiple-choice options provided:

- Option 1: 2
- Option 2: 6
- Option 3: 4

- Option 4: 8

Our calculated result of 4 matches Option 3.

47. Answer: a

Explanation:

Calculating Annual Savings Percentage

This problem involves calculating a person's monthly expenditures over different periods and determining their savings percentage based on their annual income. We need to carefully calculate the total expenditure first.

Expenditure Analysis

Let's break down the expenditure step-by-step:

- **Expenditure for the first 4 months:** The average monthly expenditure is given as Rs. 231.25. Total expenditure for these 4 months is calculated as:

$$\text{Expenditure}_{4 \text{ months}} = \text{Average Monthly Expenditure} \times \text{Number of Months}$$

$$\text{Expenditure}_{4 \text{ months}} = 231.25 \times 4 = 925$$

So, the total expenditure for the first four months was Rs. 925.

- **Expenditure for the next 5 months:** The average monthly expenditure during these 5 months was Rs. 22.75 more than the first four months. New average monthly expenditure = Rs. $(231.25 + 22.75) = 254$ Total expenditure for these 5 months is:

$$\text{Expenditure}_{5 \text{ months}} = \text{New Average Monthly Expenditure} \times \text{Number of Months}$$

$$\text{Expenditure}_{5 \text{ months}} = 254 \times 5 = 1270$$

The total expenditure for the next five months was Rs. 1270.

- **Expenditure for the remaining 3 months:** The problem states that the total expenditure for the remaining 3 months was Rs. 605.

$$\text{Expenditure}_{3 \text{ months}} = 605$$

Total Annual Expenditure Calculation

To find the total annual expenditure, we sum the expenditures from all three periods:

$$\text{Total Annual Expenditure} = \text{Expenditure}_{4 \text{ months}} + \text{Expenditure}_{5 \text{ months}} + \text{Expenditure}_{3 \text{ months}}$$

$$\text{Total Annual Expenditure} = 925 + 1270 + 605$$

$$\text{Total Annual Expenditure} = 2800$$

The total expenditure for the entire year was Rs. 2800.

Calculating Annual Savings

The annual income is given as Rs. 3500. Savings are calculated by subtracting the total expenditure from the annual income.

$$\text{Annual Savings} = \text{Annual Income} - \text{Total Annual Expenditure}$$

$$\text{Annual Savings} = 3500 - 2800$$

$$\text{Annual Savings} = 700$$

The person saved Rs. 700 during the year.

Determining Savings Percentage

The final step is to calculate what percentage of the annual income the savings represent.

$$\text{Percentage Savings} = \left(\frac{\text{Annual Savings}}{\text{Annual Income}} \right) \times 100\%$$

$$\text{Percentage Savings} = \left(\frac{700}{3500} \right) \times 100\%$$

$$\text{Percentage Savings} = \left(\frac{1}{5} \right) \times 100\%$$

$$\text{Percentage Savings} = 20\%$$

Therefore, the person saved 20% of his annual income.

48. Answer: b

Explanation:

Understanding the Average Age Ratio Problem

This problem asks us to find the ratio between the number of boys and the number of girls in a class. We are given the average age of all students in the class, the average age of the boys, and the average age of the girls. To solve this, we need to relate these averages to the counts of boys and girls, focusing on the key terms: **average age**, **boys**, **girls**, and **ratio**.

Solving Using the Allegation Method

The allegation method is a common technique for solving problems where we need to find the ratio of two quantities that have different average values, mixed together to achieve an overall average value. This method is efficient for this type of average age problem.

Here's the information we have:

- Average age of Boys: 16.4 years
- Average age of Girls: 15.4 years
- Average age of the entire Class (Mixture): 15.8 years

We set up the allegation diagram like this:

Boys' Average Age (16.4)	Girls' Average Age (15.4)
Class Average Age (15.8)	
Difference 1 (Calculated as Class Avg - Girls Avg)	Difference 2 (Calculated as Boys Avg - Class Avg)
$15.8 - 15.4 = 0.4$	$16.4 - 15.8 = 0.6$

The differences calculated diagonally represent the ratio of the quantities of the two groups (boys and girls).

1. Difference between the Class Average Age and Girls' Average Age: $15.8 - 15.4 = 0.4$
2. Difference between the Boys' Average Age and the Class Average Age: $16.4 - 15.8 = 0.6$

The ratio of the number of boys to the number of girls is determined by these differences:

Ratio (Number of Boys : Number of Girls) = (Difference 1) : (Difference 2)

$$\text{Ratio (Boys : Girls)} = 0.4 : 0.6$$

To simplify this ratio, we can write it as a fraction and reduce it:

$$\frac{\text{Number of Boys}}{\text{Number of Girls}} = \frac{0.4}{0.6} = \frac{4}{6} = \frac{2}{3}$$

So, the ratio of boys to girls is 2 : 3. This indicates that for every 2 boys in the class, there are 3 girls.

Verification Using Weighted Average Formula

We can confirm our result using the standard formula for weighted averages. Let B represent the number of boys and G represent the number of girls in the class.

The formula for the average age of the class is:

$$\text{Average Age}_{\text{Class}} = \frac{(\text{Average Age}_{\text{Boys}} \times B) + (\text{Average Age}_{\text{Girls}} \times G)}{B + G}$$

Plugging in the given values:

$$15.8 = \frac{(16.4 \times B) + (15.4 \times G)}{B + G}$$

To solve for the ratio $B : G$, we first multiply both sides by $(B + G)$:

$$15.8(B + G) = 16.4B + 15.4G$$

Distribute 15.8 on the left side:

$$15.8B + 15.8G = 16.4B + 15.4G$$

Now, we rearrange the terms to gather B terms on one side and G terms on the other:

$$15.8G - 15.4G = 16.4B - 15.8B$$

Simplify both sides:

$$0.4G = 0.6B$$

Finally, to find the ratio of Boys to Girls (B/G), we can rearrange the equation:

$$\frac{B}{G} = \frac{0.4}{0.6}$$

Simplify the fraction:

$$\frac{B}{G} = \frac{4}{6} = \frac{2}{3}$$

This calculation confirms that the ratio of the number of boys to the number of girls is $2 : 3$.

Conclusion on the Ratio

Both the allegation method and the weighted average formula show that the ratio of the number of boys to the number of girls in the class is $2 : 3$. This result aligns

with the provided options.

49. Answer: a

Explanation:

Calculating Tank Volume Using Initial Bucket Details

The problem states that **18 buckets** of water, each with a capacity of **8 litres**, completely fill a specific tank. To solve this, we first need to find the total capacity of the tank. The total capacity is the product of the number of buckets and the volume each bucket holds.

The calculation for the total tank capacity is:

$$\text{Total Tank Capacity} = (\text{Number of buckets}) \times (\text{Capacity per bucket})$$

Using the given values:

- Number of buckets = 18
- Capacity per bucket = 8 litres

So, the total capacity is:

$$\text{Total Tank Capacity} = 18 \times 8 \text{ litres}$$

$$\text{Total Tank Capacity} = 144 \text{ litres}$$

This means the tank holds exactly 144 litres of water when full.

Determining Buckets Needed for New Capacity

Next, we need to find out how many buckets will be needed to fill this same tank if the capacity of each bucket is changed to **12 litres**. Since the total volume of the tank (144 litres) remains the same, we can find the new number of buckets by dividing the total capacity by the new capacity of each bucket.

The formula is:

New Number of Buckets = Total Tank Capacity / New capacity per bucket

Using the calculated and given values:

- Total Tank Capacity = 144 litres
- New capacity per bucket = 12 litres

Now, we calculate the new number of buckets:

$$\text{New Number of Buckets} = \frac{144}{12}$$

$$\text{New Number of Buckets} = 12$$

Final Result

Therefore, **12 buckets**, each with a capacity of 12 litres, are required to fill the tank.

Verification of the Answer

We can verify this result by checking if both scenarios result in the same total volume:

- Scenario 1: 18 buckets $\times$ 8 litres/bucket = 144 litres
- Scenario 2: 12 buckets $\times$ 12 litres/bucket = 144 litres

Both calculations confirm that the total volume of the tank is 144 litres, validating our answer.

50. **Answer: c**

Explanation:

Solving Srinivasan's Investment Problem

This question asks us to determine the amount of money Srinivasan invested in each of two banks, given that he invested equal sums in both and received different interest rates. We know the total interest earned after one year.

Analyzing the Investment Details

Let's break down the information provided:

- **Equal Investment:** Srinivasan invested the same principal amount, let's call it P , in two different banks.
- **Bank 1:** Offers an annual interest rate of $R_1 = 8\%$.
- **Bank 2:** Offers an annual interest rate of $R_2 = 12\%$.
- **Time Period:** The investment duration is $T = 1$ year.
- **Total Interest:** The combined interest earned from both banks at the end of the year is Rs. 1500.

Calculating the Total Interest Based on Investment

We need to calculate the interest earned from each bank separately using the simple interest formula: $SI = \frac{P \times R \times T}{100}$. Since the time period T is 1 year, the formula simplifies to $SI = \frac{P \times R}{100}$. Alternatively, using the rate R as a decimal (e.g., $8\% = 0.08$), the formula becomes $SI = P \times R \times T$. We will use the decimal method here as it integrates well with the calculation.

Interest from Bank 1

The principal invested is P , the rate is $R_1 = 0.08$, and the time is $T = 1$.

$$\text{Interest from Bank 1}(SI_1) = P \times 0.08 \times 1 = 0.08P$$

Interest from Bank 2

The principal invested is P , the rate is $R_2 = 0.12$, and the time is $T = 1$.

$$\text{Interest from Bank 2}(SI_2) = P \times 0.12 \times 1 = 0.12P$$

Total Interest Calculation

The total interest earned is the sum of the interest from both banks:

$$\text{Total Interest} = SI_1 + SI_2$$

$$\text{Total Interest} = 0.08P + 0.12P$$

Combining the terms:

$$\text{Total Interest} = (0.08 + 0.12)P$$

$$\text{Total Interest} = 0.20P$$

Determining the Invested Sum (P)

We are given that the total interest earned is Rs. 1500. We can now set up an equation to solve for P :

$$0.20P = 1500$$

To find P , we need to isolate it by dividing both sides of the equation by 0.20:

$$P = \frac{1500}{0.20}$$

To make the division easier, we can express 0.20 as a fraction, $\frac{20}{100}$ or $\frac{1}{5}$:

$$P = \frac{1500}{1/5}$$

Dividing by a fraction is the same as multiplying by its reciprocal:

$$P = 1500 \times 5$$

$$P = 7500$$

Final Answer Verification

So, Srinivasan invested Rs. 7500 in each bank.

Let's check this:

- Interest from Bank 1 = $7500 \times 0.08 \times 1 = 600$
- Interest from Bank 2 = $7500 \times 0.12 \times 1 = 900$

- Total Interest = $600 + 900 = 1500$

This matches the total interest given in the problem, confirming our calculation.

51. Answer: b

Explanation:

Understanding Simple Interest Calculation

This problem requires us to find the annual rate of interest when we know the time period and the relationship between the simple interest (SI) earned and the principal amount (P). We are told that the interest earned over 4 years is one-fifth of the principal.

Extracting Key Information

- Let the principal amount be denoted by P .
- The time period (T) is given as 4 years.
- The simple interest (SI) accrued is $\frac{1}{5}$ of the principal, which can be written as $SI = \frac{P}{5}$.
- We need to find the rate of interest per annum, denoted by R .

The Simple Interest Formula

The basic formula to calculate simple interest is:

$$SI = \frac{P \times R \times T}{100}$$

Where:

- SI stands for Simple Interest
- P stands for the Principal amount
- R stands for the Rate of interest per annum (in percent)
- T stands for the Time period in years

Step-by-Step Calculation for Rate

We can use the information given and the formula to solve for R .

1. **Substitute Known Values:** Plug the values of SI and T into the formula:

$$\frac{P}{5} = \frac{P \times R \times 4}{100}$$

2. **Simplify the Equation:** Since P appears on both sides of the equation and we assume $P \neq 0$, we can cancel P from both sides:

$$\frac{1}{5} = \frac{R \times 4}{100}$$

3. **Isolate the Rate (R):** To find R , we first multiply both sides of the equation by 100 :

$$\frac{100}{5} = R \times 4$$

$$20 = 4R$$

4. **Solve for R :** Now, divide both sides by 4:

$$R = \frac{20}{4}$$

$$R = 5$$

Determining the Interest Rate

The calculation clearly shows that the value of R is 5. Therefore, the rate of interest per annum is 5%. This means that for every 100 units of money invested or borrowed, an interest of 5 units is generated each year.

Final Answer Confirmation

The calculation confirms that when the simple interest earned in 4 years is 1/5th of the principal, the annual interest rate is 5%.

52. Answer: a

Explanation:

Given:

Total sum = Rs. 2600

Total annual income = Rs. 206

First rate of interest = 9%

Second rate of interest = 7%

Formula:

$$SI = \frac{Prt}{100}$$

Calculation:

Let the sum given at 7% annum be Rs, x

$$\Rightarrow \text{Sum given at 9\% annum} = (2600 - x)$$

According to the question

$$(x \times 7 \times 1)/100 + [(2600 - x) \times 9 \times 1]/100 = 206$$

$$\Rightarrow 7x + 23400 - 9x = 20600$$

$$\Rightarrow 9x - 7x = 23400 - 20600$$

$$\Rightarrow 2x = 2800$$

$$\Rightarrow x = 2800/2$$

$$\Rightarrow x = 1400$$

$\therefore$ The sum given at 7% rate of interest is Rs. 1400

Short Trick:

$$\text{Average interest rate} = 206/2600 \times 100 = (103/13)\%$$

Using allegation method

$$9\% \qquad \qquad 7\%$$

$$(103/13) \%$$

Multiply by 13 in each unit

$$117\% \qquad \qquad 91\%$$

$$103\%$$

$$12 \qquad : \qquad 14\%$$

$$\Rightarrow \text{Ratio of sum given at 9\% and 7\%} = 12 : 14 = 6x : 7x$$

$$6x + 7x = 2600$$

$$\Rightarrow 13x = 2600$$

$$\Rightarrow x = 200$$

$$\Rightarrow 7x = 1400$$

$\therefore$ The sum given at 7% rate of interest is Rs. 1400

53. Answer: b

Explanation:

Election Vote Calculation Explained

This problem involves calculating the total number of enrolled voters in an election based on the turnout, the percentage of invalid votes, and the votes received by one candidate.

Step 1: Determine Valid Votes

We are given that a candidate received 7203 votes, and this amount represents 60% of the total **valid votes** cast in the election. To find the total number of valid votes, we can set up the following equation:

Let V_{valid} represent the total number of valid votes.

The candidate's votes = 60% of V_{valid}

Mathematically, this is expressed as:

$$7203 = 0.60 \times V_{\text{valid}}$$

To find the total valid votes, we rearrange the equation:

$$V_{\text{valid}} = \frac{7203}{0.60}$$

Calculating this value:

$$V_{\text{valid}} = 12005$$

So, there were 12005 valid votes in total.

Step 2: Calculate Total Votes Cast

We know that 2% of the votes that were cast were declared invalid. This means that the remaining 98% of the votes cast were valid.

Let V_{cast} represent the total number of votes cast.

Valid Votes = 98% of V_{cast}

Using the value of valid votes calculated in Step 1:

$$12005 = 0.98 \times V_{\text{cast}}$$

Now, we solve for the total votes cast:

$$V_{\text{cast}} = \frac{12005}{0.98}$$

Calculating this value:

$$V_{\text{cast}} \approx 12250$$

Approximately 12250 votes were cast in the election.

Step 3: Find Total Enrolled Voters

The problem states that 70% of the **total number of voters enrolled** actually cast their votes. Let V_{enrolled} represent the total number of enrolled voters.

$$\text{Votes Cast} = 70\% \text{ of } V_{\text{enrolled}}$$

Using the value of total votes cast from Step 2:

$$12250 = 0.70 \times V_{\text{enrolled}}$$

To find the total number of enrolled voters, we rearrange the equation:

$$V_{\text{enrolled}} = \frac{12250}{0.70}$$

Calculating the final value:

$$V_{\text{enrolled}} = 17500$$

Step 4: Final Result

Therefore, the total number of voters enrolled in the election was 17500.

Summary of Calculations

Total Enrolled Voters	$= V$
Votes Cast (70%)	$= 0.70 \times V$
Valid Votes (98% of Votes Cast)	$= 0.98 \times (0.70 \times V) = 0.686 \times V$
Candidate's Votes (60% of Valid Votes)	$= 0.60 \times (0.686 \times V) = 0.4116 \times V$
Given Candidate's Votes	$= 7203$

Equating the candidate's votes:

$$7203 = 0.4116 \times V$$

Solving for V:

$$V = \frac{7203}{0.4116}$$

$$V = 17500$$

The total number of voters enrolled in the election is 17500.

54. Answer: b

Explanation:

Understanding the Relationship Between Price, Consumption, and Expenditure

The fundamental concept here involves the relationship between the price of a good, the quantity consumed, and the total expenditure. The formula connecting these is:

$$\text{Expenditure} = \text{Price} \times \text{Consumption}$$

The question states that the **price of kerosene** increases, and we need to find the percentage by which the **consumption** must be reduced so that the total **expenditure** does not increase. This means the expenditure must remain constant.

Calculating the Percentage Reduction in Consumption

Let's assume the original price of kerosene was P and the original consumption was Q .

The original expenditure (E) is given by:

$$E = P \times Q$$

The price of kerosene is raised by 11%. The new price (P') will be:

$$P' = P + (11\% \text{ of } P)$$

$$P' = P + \frac{11}{100} \times P$$

$$P' = P \times (1 + \frac{11}{100})$$

$$P' = P \times (1 + 0.11) = 1.11P$$

Now, let the new consumption be Q' . The new expenditure (E') is:

$$E' = P' \times Q'$$

$$E' = (1.11P) \times Q'$$

The condition is that the expenditure should not increase, meaning the new expenditure must equal the original expenditure ($E' = E$).

$$1.11P \times Q' = P \times Q$$

To find the new consumption Q' , we can rearrange the equation. Divide both sides by P (assuming P is not zero):

$$1.11Q' = Q$$

$$Q' = \frac{Q}{1.11}$$

The reduction in consumption is the difference between the original consumption and the new consumption:

$$\text{Reduction} = Q - Q'$$

$$\text{Reduction} = Q - \frac{Q}{1.11}$$

Factor out Q :

$$\text{Reduction} = Q \times (1 - \frac{1}{1.11})$$

To find the percentage reduction, we divide the reduction by the original consumption (Q) and multiply by 100:

$$\text{Percentage Reduction} = \frac{Q \times (1 - \frac{1}{1.11})}{Q} \times 100$$

$$\text{Percentage Reduction} = (1 - \frac{1}{1.11}) \times 100$$

Simplify the expression inside the parenthesis:

$$\text{Percentage Reduction} = (\frac{1.11-1}{1.11}) \times 100$$

$$\text{Percentage Reduction} = \frac{0.11}{1.11} \times 100$$

$$\text{Percentage Reduction} = \frac{11}{1.11}$$

Now, let's calculate the value:

$$\frac{11}{1.11} \approx 9.909909...$$

Rounding this to one decimal place, we get 9.9%.

Conclusion

Therefore, a householder must reduce their consumption of kerosene by approximately **9.9%** to ensure their expenditure remains the same after the price increase. This matches one of the provided options.

55. Answer: d

Explanation:

Pupils Examination Pass Percentage Calculation

This problem involves calculating the pass percentage for a second school based on information provided about a first school and the relationship between the two schools' performance.

Determining School 1 Pass Data

First, let's identify the key information for the initial school:

- Total pupils appeared from the first school = 75
- Percentage of pupils who passed from the first school = 80%

We can calculate the actual number of pupils who passed from the first school using the following calculation:

$$\text{Number of pupils passed (School 1)} = \text{Pass Percentage}_{\text{School 1}} \times \text{Total Pupils}_{\text{School 1}}$$

$$\text{Number of pupils passed (School 1)} = 80\% \times 75$$

$$\text{Number of pupils passed (School 1)} = \frac{80}{100} \times 75$$

$$\text{Number of pupils passed (School 1)} = \frac{4}{5} \times 75$$

$$\text{Number of pupils passed (School 1)} = 4 \times 15 = 60 \text{ pupils.}$$

Calculating Second School's Total Pupils

Next, we need to determine the total number of pupils who appeared from the second school. The problem states:

- The second school entered 10 more pupils than the first school.

So, the total pupils for the second school are:

$$\text{Total pupils (School 2)} = \text{Total pupils (School 1)} + 10$$

$$\text{Total pupils (School 2)} = 75 + 10 = 85 \text{ pupils.}$$

Calculating Second School's Passes

Now, let's find out how many pupils passed from the second school. The information given is:

- The second school had five pupils less than the first school who passed.

Using the number of passes from the first school, we calculate the passes for the second school:

$$\text{Number of pupils passed (School 2)} = \text{Number of pupils passed (School 1)} - 5$$

Number of pupils passed (School 2) = $60 - 5 = 55$ pupils.

Calculating Second School's Pass Percentage

Finally, we calculate the pass percentage for the second school. The formula for pass percentage is:

$$\text{Pass Percentage} = \left(\frac{\text{Number of Pupils Passed}}{\text{Total Pupils Appeared}} \right) \times 100\%$$

Applying this formula to the second school:

$$\text{Pass Percentage (School 2)} = \left(\frac{\text{Number of pupils passed (School 2)}}{\text{Total pupils (School 2)}} \right) \times 100\%$$

$$\text{Pass Percentage (School 2)} = \left(\frac{55}{85} \right) \times 100\%$$

To simplify the calculation, we can reduce the fraction $\frac{55}{85}$ by dividing both the numerator and the denominator by their greatest common divisor, which is 5:

$$\frac{55 \div 5}{85 \div 5} = \frac{11}{17}$$

Now, we calculate the percentage:

$$\text{Pass Percentage (School 2)} = \frac{11}{17} \times 100\%$$

$$\text{Pass Percentage (School 2)} \approx 0.6470588 \times 100\%$$

$$\text{Pass Percentage (School 2)} \approx 64.70588\%$$

Rounding the result to one decimal place gives us 64.7%.

Therefore, the pass percentage in the second school was approximately **64.7%**.

56. Answer: b

Explanation:

Proportion Division Calculation

This problem requires us to divide a total sum of money, which is Rs. 80, into three parts according to a specified ratio: 3 : 6 : 7. We need to determine the specific monetary value for each of these three parts.

Understanding Ratio Division

Dividing a quantity according to a ratio involves splitting it into parts that are in proportion to the numbers given in the ratio. The steps are:

- Sum the numbers (parts) in the ratio.
- Determine the fraction of the total that each part of the ratio represents.
- Multiply these fractions by the total amount to find the value of each share.

Step-by-Step Calculation for Dividing Rs. 80

The total amount to be divided is Rs. 80.

The given ratio is 3 : 6 : 7.

1. Calculate the Sum of Ratio Parts:

We begin by adding the individual numbers in the ratio to get the total number of parts the sum is divided into.

Sum of parts = $3 + 6 + 7 = 16$ parts.

2. Calculate the First Share (Corresponding to ratio part 3):

The first share corresponds to 3 parts out of the total 16 parts. This represents the fraction $\frac{3}{16}$ of the total amount.

Calculation for Share 1 = $\left(\frac{\text{Ratio part}}{\text{Sum of parts}} \right) \times \text{Total Amount}$

$$\text{Share 1} = \left(\frac{3}{16} \right) \times 80$$

To simplify, we can first divide 80 by 16:

$$\text{Share 1} = 3 \times \left(\frac{80}{16} \right)$$

Share 1 = $\$3 \times 5 = 15\$$. Thus, the first share is Rs. 15.

3. Calculate the Second Share (Corresponding to ratio part 6):

The second share corresponds to 6 parts out of the total 16 parts, or $\frac{6}{16}$ of the total amount.

$$\text{Calculation for Share 2} = \left(\frac{6}{16}\right) \times 80$$

$$\text{Share 2} = 6 \times \left(\frac{80}{16}\right)$$

Share 2 = $\$6 \times 5 = 30\$$. Therefore, the second share is Rs. 30.

4. Calculate the Third Share (Corresponding to ratio part 7):

The third share corresponds to 7 parts out of the total 16 parts, representing $\frac{7}{16}$ of the total amount.

$$\text{Calculation for Share 3} = \left(\frac{7}{16}\right) \times 80$$

$$\text{Share 3} = 7 \times \left(\frac{80}{16}\right)$$

Share 3 = $\$7 \times 5 = 35\$$. Hence, the third share is Rs. 35.

Summary of Calculated Shares

After performing the calculations, dividing Rs. 80 in the ratio 3 : 6 : 7 results in three shares: Rs. 15, Rs. 30, and Rs. 35.

Checking the Calculation Accuracy

To verify that the division is correct, we sum the calculated shares:

$$\text{Total Shares} = \text{Rs. 15} + \text{Rs. 30} + \text{Rs. 35} = \text{Rs. 80}.$$

Since the sum of the shares equals the original total amount (Rs. 80), our calculations are accurate.

Comparing Calculated Shares with Options

The calculated shares are Rs. 15, Rs. 30, and Rs. 35. We now compare this result with the options provided:

- Rs. 10, Rs. 35, Rs. 40
- **Rs. 15, Rs. 30, Rs. 35**
- Rs. 15, Rs. 35, Rs. 30
- Rs. 10, Rs. 40, Rs. 35

The set of calculated shares, Rs. 15, Rs. 30, and Rs. 35, matches exactly with the second option.

57. Answer: d

Explanation:

Calculating Compound Amount for Rs. 1875

This solution explains how to calculate the final amount when a principal sum is invested or borrowed at a specific interest rate, compounded annually over a period of time. We will focus on calculating the **amount** on Rs. 1875 for **2 years** at **4% per annum**, compounded yearly.

Understanding the Compound Interest Components

To solve this problem, we need to identify the key values involved:

- **Principal (P):** This is the initial amount of money, which is Rs. 1875.
- **Annual Interest Rate (r):** The rate at which the interest is calculated per year. Here, it is 4% per annum. We need to convert this percentage into a decimal for calculation: $r = 4\% = \frac{4}{100} = 0.04$.
- **Time Period (n):** The duration for which the money is invested or borrowed, which is 2 years.
- **Compounding Frequency:** The interest is compounded yearly, meaning the interest earned each year is added to the principal for the next year's calculation.

- **Amount (A):** The final amount after the specified time period, including the principal and the accumulated compound interest.

Formula for Compound Amount

The formula used to calculate the final amount (A) when interest is compounded annually is:

$$A = P(1 + r)^n$$

Where:

- A = the future value of the investment/loan, including interest
- P = the principal investment amount (the initial deposit or loan amount)
- r = the annual interest rate (as a decimal)
- n = the number of years the money is invested or borrowed for

Step-by-Step Calculation

Let's apply the formula using the given values:

1. Substitute the values:

- Principal, $P = 1875$
- Rate, $r = 0.04$
- Time, $n = 2$

The formula becomes:

$$A = 1875(1 + 0.04)^2$$

2. Simplify the term inside the parentheses:

$$A = 1875(1.04)^2$$

3. Calculate the exponent term (1.04^2):

$$(1.04)^2 = 1.04 \times 1.04 = 1.0816$$

4. Multiply the principal by the result:

$$A = 1875 \times 1.0816$$

5. Calculate the final amount:

$$A = 2028$$

Final Amount Calculation Result

The calculation shows that the final amount after 2 years at an annual interest rate of 4%, compounded yearly, on a principal of Rs. 1875 is Rs. 2028.

Therefore, the amount is Rs. 2028.

58. Answer: d

Explanation:

Solving the Variation Problem: x Varies as y

This problem involves understanding the concept of direct variation, specifically when one variable, x , varies as another variable, y . This means that x is directly proportional to y .

Understanding Direct Variation

When we say ' x varies as y ', it mathematically translates to the relationship:

$$x \propto y$$

This proportionality can be expressed as an equation by introducing a constant of variation, often denoted by k . The equation becomes:

$$x = ky$$

Here, k is a non-zero constant. For any pair of (x, y) values that satisfy this relationship, the ratio $\frac{x}{y}$ will always be equal to k .

Step 1: Determining the Constant of Variation (k)

We are given a specific scenario where $x = 8$ when $y = 15$. We can use these values to find the value of the constant k . Plugging these values into our equation $x = ky$:

$$8 = k \times 15$$

To solve for k , we divide both sides of the equation by 15:

$$k = \frac{8}{15}$$

So, the constant of variation is $\frac{8}{15}$. Our specific variation equation is now:

$$x = \frac{8}{15}y$$

Step 2: Calculating the Value of x for a New Value of y

The question asks for the value of x when $y = 10$. We use the variation equation we found in Step 1, substituting $y = 10$:

$$x = \frac{8}{15} \times 10$$

Step 3: Simplifying the Result

Now, we perform the multiplication:

$$x = \frac{8 \times 10}{15}$$

$$x = \frac{80}{15}$$

To simplify this fraction, we find the greatest common divisor (GCD) of the numerator (80) and the denominator (15). The GCD is 5.

Divide both the numerator and the denominator by 5:

$$x = \frac{80 \div 5}{15 \div 5}$$

$$x = \frac{16}{3}$$

Therefore, when $y = 10$, the value of x is $\frac{16}{3}$.

59. Answer: c

Explanation:

Given:

The total quantity of mixture = 60 litres

The ratio of milk to water = 2 : 1

Formula:

If N is divided into a : b

First part = $N \times \frac{a}{a+b}$

Second part = $N \times \frac{b}{a+b}$

Calculation:

Quantity of milk in the mixture = $60 \times \left(\frac{2}{3}\right) = 40$ litres

$\Rightarrow$ Quantity of water in the mixture = $60 - 40 = 20$ litres

Let added quantity of water be x

According to the question

$$40/(x + 20) = 1/2$$

$$\Rightarrow 40 \times 2 = (x + 20)$$

$$\Rightarrow 80 = x + 20$$

$$\Rightarrow x = 80 - 20$$

$$\Rightarrow x = 60$$

$\therefore$ Added quantity of water is 60 litres

60. Answer: a

Explanation:

Understanding the Loan Distribution Problem

This question involves distributing a total sum of money, **Rs. 10,000**, into two parts. One part is lent at an annual interest rate of **6%**, and the remaining part is lent at **10% per annum (p.a.)**. We are given that the average yearly interest earned on the total sum is **9.2%**. The goal is to find out how much money was lent at the 10% rate.

Applying the Alligation Method to Interest Rates

The method of alligation is a useful technique for solving problems where a mixture or average is involved. We compare the individual interest rates (6% and 10%) with the overall average interest rate (9.2%). The differences between the average rate and the individual rates help us determine the ratio in which the principal amounts were divided.

Steps for Alligation:

1. Place the lower interest rate (6%) and the higher interest rate (10%) on the left side.
2. Place the mean (average) interest rate (9.2%) in the center.
3. Calculate the difference between the mean rate and each individual rate.
Write the difference between the mean rate and the lower rate ($9.2\% - 6\% = 3.2\%$) on the right side, diagonally opposite the lower rate.
4. Write the difference between the higher rate and the mean rate ($10\% - 9.2\% = 0.8\%$) on the right side, diagonally opposite the higher rate.

These differences represent the ratio of the principal amounts associated with each rate, but in inverse order.

Category	Interest Rate (%)	Difference from Mean (%)
Lower Rate (6%)	6	$9.2 - 6 = 3.2$
Higher Rate (10%)	10	$10 - 9.2 = 0.8$
Ratio of Amounts (Principal at 6% : Principal at 10%)	0.8 : 3.2	

We simplify the ratio 0.8 : 3.2. Multiply both numbers by 10 to remove decimals: 8 : 32. Divide both numbers by their greatest common divisor, which is 8: Ratio = $\frac{8}{8} : \frac{32}{8} = 1 : 4$.

This ratio 1 : 4 means that the total amount (Rs. 10,000) was divided into $1 + 4 = 5$ parts. The amount lent at 6% corresponds to 1 part, and the amount lent at 10% corresponds to 4 parts.

Calculating the Amount Lent at 10%

With the ratio established as 1:4, we can now calculate the actual amount lent at the 10% interest rate. The total sum of Rs. 10,000 is divided into 5 parts.

Amount lent at 10% = $\$ \left(\frac{\text{Number of parts for 10\% rate}}{\text{Total number of parts}} \right) \times \text{Total Sum}$

Calculation: Amount at 10% = $\left(\frac{4}{1+4} \right) \times 10,000$ Amount at 10% = $\left(\frac{4}{5} \right) \times 10,000$ Amount at 10% = $4 \times \frac{10,000}{5}$ Amount at 10% = $4 \times 2,000$ Amount at 10% = **Rs. 8,000**

Algebraic Verification of the Loan Amount

Let's verify this using algebra. Assume the amount lent at 10% is Rs. x . Consequently, the amount lent at 6% must be Rs. $(10,000 - x)$.

The total interest earned in a year is the sum of the interests from both parts. The average interest rate is 9.2% on Rs. 10,000. Total Yearly Interest = $9.2\% \times 10,000 = 0.092 \times 10,000 = \text{Rs. } 920$.

We can also express the total interest as the sum of interest from each part: Interest from 6% part = $6\% \times (10,000 - x) = 0.06(10,000 - x)$ Interest from 10% part = $10\% \times x = 0.10x$

Now, we set up the equation: $0.06(10,000 - x) + 0.10x = 920$

Solving the equation: $600 - 0.06x + 0.10x = 920$ Combine the terms with x : $0.04x = 920 - 600$ $0.04x = 320$ Isolate x : $x = \frac{320}{0.04}$ $x = \frac{32000}{4}$ $x = 8,000$

The algebraic method confirms that the amount lent at 10% is Rs. 8,000.

Final Answer

Based on both the alligation method and the algebraic calculation, the amount of money lent at the 10% interest rate is **Rs. 8,000**.

61. Answer: c

Explanation:

Identifying the Least Similar Word in the Group

The task is to find the word among the given options that is least like the others. This involves examining the common characteristics shared by most of the words and identifying the outlier.

Analyzing the Characteristics of Each Word

Let's examine each option to understand its context:

- **Garó:** This refers to the Garo people, a significant ethnic tribe primarily residing in the Garo Hills region of **Meghalaya**, Northeast India.
- **Khasi:** This refers to the Khasi people, another major indigenous community also mainly inhabiting **Meghalaya** and surrounding areas in Northeast India.
- **Jayantia:** This name relates to the Jaintia people (or Pnar people), who are ethnically and linguistically closely related to the Khasi people and

predominantly live in the Jaintia Hills district of **Meghalaya**, Northeast India.

- **Kangra:** This term primarily denotes a region in the state of **Himachal Pradesh**, located in North India. Kangra is renowned for its unique art form (Kangra painting), Kangra tea, and a breed of domestic fowl. It is geographically and culturally distinct from the northeastern context of the other options.

Comparing Garo, Khasi, Jaintia, and Kangra

A clear distinction emerges when comparing the geographical and cultural associations of these terms:

Word	Primary Association	Geographical Region	Type
Garo	Ethnic Tribe	Northeast India (Meghalaya)	Community
Khasi	Ethnic Tribe	Northeast India (Meghalaya)	Community
Jaintia	Ethnic Tribe	Northeast India (Meghalaya)	Community
Kangra	Region / Art / Tea	North India (Himachal Pradesh)	Place / Cultural Product

Determining the Odd Word Out

The words Garo, Khasi, and Jaintia all share a commonality: they represent major ethnic tribal communities predominantly located in the northeastern Indian state of Meghalaya. They belong to the same broad geographical and cultural region.

Conversely, Kangra is distinctly different as it represents a geographical region in North India (Himachal Pradesh), far removed from the northeastern context. Its associations are related to place, art, and agriculture, not a specific tribal community in the same sense as the other three.

Therefore, **Kangra** is the word that is least like the others in the group due to its different geographical origin and context.

62. Answer: d

Explanation:

Identifying the Least Similar Word: Virgo, Pisces, Cancer, Orion

This question asks us to find the word that doesn't belong with the others in the given group. We need to look for a common characteristic shared by most of the words and identify the one that lacks this characteristic.

Analysis of the Word Group

Let's examine each option:

- **Virgo**: This is one of the twelve signs of the Zodiac. It represents a specific period of the year and is associated with a corresponding constellation.
- **Pisces**: This is also one of the twelve signs of the Zodiac, similar to Virgo, representing a period and a constellation.
- **Cancer**: Like Virgo and Pisces, Cancer is another one of the twelve Zodiac signs, linked to a specific time of year and a constellation.
- **Orion**: Orion is a very well-known constellation, easily recognizable by its prominent belt of three stars. However, it is not one of the twelve Zodiac constellations.

Key Distinction

The primary distinction lies in the classification of these terms:

- Virgo, Pisces, and Cancer are all established **Zodiac signs**, which are a specific subset of constellations used in astrology and related to the apparent path of the Sun across the sky over the year.

- Orion, while a prominent **constellation**, is not part of the Zodiac. It lies on the celestial equator and is visible worldwide.

Conclusion

Based on the analysis, Virgo, Pisces, and Cancer share the common characteristic of being Zodiac signs. Orion, although a constellation, does not belong to this specific group. Therefore, Orion is the word that is least like the others.

63. Answer: b

Explanation:

Identifying the Word Least Like the Others: Body Parts Grouping

The task is to select the word from the given options that is least similar to the others. We need to find a common characteristic shared by most of the words and identify the one that does not share this characteristic.

Analyzing the Body Parts Provided

Let's look closely at each word and its place in the human body:

- **Shoulder:** This refers to the complex of joints and muscles connecting the upper arm to the torso. It is a key part of the **upper limb**.
- **Finger:** These are the digits located at the end of the hand. The hand is attached to the forearm, which is part of the **upper limb**.
- **Elbow:** This is the joint in the middle of the arm, connecting the upper arm and the forearm. It is another critical part of the **upper limb**.
- **Foot:** This is the terminal part of the leg, below the ankle, responsible for standing and walking. It is part of the **lower limb**.

Determining the Outlier in the Group

We can observe a pattern here. The words **Shoulder**, **Finger**, and **Elbow** are all parts or joints associated with the arm, which constitutes the **upper limb**.

The word **Foot**, however, belongs to the leg, which is the **lower limb**.

This difference in location (upper limb versus lower limb) makes the 'Foot' distinct from the other options.

Conclusion: The Least Similar Word

Therefore, the word that is least like the others in the group is **Foot**, as it represents a part of the lower limb, while the others (Shoulder, Finger, Elbow) are all components of the upper limb.

64. Answer: d

Explanation:

Identifying the Word Least Like the Group

The objective is to identify the word from the list that is dissimilar to the others. This requires understanding the meaning of each word and finding the common category that links most of them, thereby isolating the outlier.

Detailed Analysis of Each Word

Let's examine the meaning of each option provided:

- **Canoe:** A canoe is a lightweight narrow boat, typically pointed at both ends and open on top, propelled by means of a paddle. It is a type of watercraft.
- **Dinghy:** A dinghy is a small boat, often open and rowed or sailed. It can also serve as a tender to a larger vessel. It is also a type of watercraft.
- **Yacht:** A yacht is a larger sailing or motor boat used primarily for pleasure, cruising, or racing. This is also a type of watercraft.
- **Igloo:** An igloo is a dome-shaped shelter built from blocks of snow or ice. It is a type of dwelling or house, typically found in arctic regions.

Finding the Common Characteristic

By analyzing the definitions, we can observe a shared characteristic among the first three options:

- **Canoe, Dinghy, and Yacht** are all different types of **boats** or **watercraft**.
- These items are primarily associated with being used on water for transport, sport, or leisure.

Determining the Odd Word Out

The word **Igloo** does not fit the established category:

- An igloo is a form of **shelter** or **housing**.
- It is associated with land and icy environments, not with water travel.
- Therefore, it is fundamentally different from a canoe, dinghy, or yacht.

Based on this analysis, the word that is least like the others in the group is **Igloo**.

65. Answer: b

Explanation:

Identifying the Odd Word Out

This question asks us to find the word that is least similar to the others in the given group. We need to carefully examine the meaning and common usage of each word: Inn, Club, Motel, and Hostel.

Analyzing Word Meanings

Let's look at the primary characteristic of each term:

- **Inn**: An establishment that primarily provides lodging (accommodation) for travelers, often also serving food and drinks.

- **Motel:** Similar to an inn, a motel offers lodging, typically designed for motorists with convenient parking access.
- **Hostel:** A type of budget-friendly accommodation, usually offering shared rooms (dormitories) and communal facilities, popular among young travelers or backpackers.
- **Club:** A group of people organized for a common purpose or interest, such as a social club, sports club, or hobby club. It can also refer to the place where such a group meets.

Determining the Least Similar Word

When we compare the definitions, we can see a common theme among 'Inn', 'Motel', and 'Hostel'. All three are types of places that offer **accommodation** or lodging to people, especially travelers.

On the other hand, a 'Club' is fundamentally different. Its main purpose is related to **social gathering**, shared activities, or common interests, rather than providing a place to stay overnight.

Therefore, 'Club' does not fit the pattern of accommodation providers shared by the other three words. It is the word that is least like the others in the group because its core function is social or activity-based, not lodging-based.

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66. Answer: b

Explanation:

Liquor : Drink Relationship Explained

The primary task is to understand the specific relationship between the words **Liquor** and **Drink**. In this pair, **Liquor** represents a specific instance or type of a broader category. The category here is **Drink**, which includes all beverages meant for consumption. Therefore, the relationship is **Specific Type : General Category**.

Evaluating Alternatives for the Specific : Category Relationship

We need to find the option that mirrors this **Specific Type : General Category** relationship:

- **Option 1: Bread : Butter**

This pair shows a food item (Bread) and a common accompaniment or spread (Butter). It does not fit the **Specific Type : General Category** pattern.

- **Option 2: Tea : Beverage**

Here, **Tea** is a specific kind of drink. **Beverage** is the general classification that includes tea and many other drinks. This option perfectly matches the identified **Specific Type : General Category** relationship.

- **Option 3: Sniff : Inhale**

Sniff is a particular way of performing the action of inhaling, usually through the nose. **Inhale** is the general action of breathing in. This represents a relationship between a specific action and a general action, not an item and its category.

- **Option 4: Water : Sip**

Water is a liquid that can be consumed. **Sip** is a method or action of drinking. This shows an item and an associated action, not the required specific-to-general category relationship.

- **Option 5: (No Text)**

This option provides no words and cannot be evaluated.

Final Selection Based on Analogy

The pair 'Liquor : Drink' establishes a clear link where one is a specific example of the other. By analyzing the options, 'Tea : Beverage' is the only pair that maintains this

exact analogy. **Tea** is a specific **Beverage**, just as **Liquor** is a specific **Drink**.

67. Answer: d

Explanation:

Analogy Explained: Evaporation Leading to Cloud Formation

The original pair is **Evaporation : Cloud**. We need to identify the relationship between these two words. **Evaporation** is the process where a liquid (like water) turns into a gas or vapor. This water vapor rises into the atmosphere and then undergoes condensation to form **clouds**. Therefore, the relationship is one of a **process** leading to a specific **formation** or result. Evaporation causes or enables cloud formation.

Evaluating the Options Based on the Relationship

Let's examine each alternative to see which one shares this 'process leading to formation' relationship:

Option 1: Mountain : Snow

This option presents **Mountain : Snow**. Snow is often found on mountains, especially during winter. However, a mountain is not formed **by** snow through a process. Snow falls **onto** mountains. This represents a relationship of location or occurrence, not a process leading to a formation. So, this option does not match the original relationship.

Option 2: Book : Pages

The second option is **Book : Pages**. A book is composed of many pages. Pages are the individual components or parts that make up the whole book. This describes a 'whole to part' relationship, not the 'process to formation' relationship we identified in the original pair.

Option 3: Pressure : Atmosphere

Next, we have **Pressure : Atmosphere**. The atmosphere exerts pressure on everything beneath it. Pressure is a characteristic or an effect *of* the atmosphere. It's not a process that results in the formation of the atmosphere itself. The relationship here is more like 'effect/property' to 'source', which is different from 'process' to 'formation'.

Option 4: Tension : Breakdown

The final option is **Tension : Breakdown**. **Tension**, whether it's physical stress on an object or emotional strain, can be considered a condition or a process that builds up over time. If this tension becomes too great, it can lead to a **breakdown** or failure. This mirrors the relationship in **Evaporation : Cloud**, where the process (evaporation) leads to a resulting state or formation (cloud). High tension leads to breakdown.

Conclusion on the Best Analogy

Comparing the relationships, the pair **Tension : Breakdown** most closely resembles the relationship between **Evaporation : Cloud**. Both pairs illustrate a cause-and-effect scenario where an initial process or condition leads to a subsequent result or formation.

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68. Answer: a

Explanation:

Analogy Explanation: Barrel to Vial Relationship

This question asks us to find the pair of words that shows the same relationship as the given pair: **Barrel : Vial**. We need to understand the connection between a barrel and a vial and then look for a similar connection among the options.

Understanding the Barrel : Vial Relationship

Let's break down the relationship between **Barrel** and **Vial**:

- A **Barrel** is typically a large, cylindrical container, often used for storing liquids like wine, oil, or whiskey.
- A **Vial** is a small container, usually made of glass, used for holding or measuring small quantities of substances, especially liquids or powders, often for medical or scientific purposes.
- The core relationship here is one of **size difference within the same category**. Both are containers, but a barrel is large, and a vial is small. It represents a large capacity container versus a small capacity container.

Analyzing the Options

Now, let's examine the relationship in each option:

Option 1: Book : Pamphlet

- A **Book** is a collection of written or printed pages bound together. It usually contains a significant amount of text and information.
- A **Pamphlet** is also a collection of pages, but it's typically much shorter, thinner, and often unbound or loosely bound. It usually focuses on a single subject or purpose.
- Relationship: Similar to Barrel : Vial, this pair represents a difference in size or substance within the same category (printed matter). A book is a larger, more substantial item, while a pamphlet is a smaller, less substantial one. This strongly matches the primary relationship.

Option 2: Book : Reader

- A **Book** is an object containing information.
- A **Reader** is a person who reads a book.
- Relationship: This pair shows an object and its user or consumer. This is different from the container size relationship seen in Barrel : Vial.

Option 3: Brochure : Compiler

- A **Brochure** is similar to a pamphlet – a small booklet or leaflet.
- A **Compiler** is a special program used in computer science that translates source code written in a programming language into machine code.
- Relationship: This pair connects a type of publication (brochure) with a tool or process (compiler). This is not related to the size or container analogy.

Option 4: Length : Height

- **Length** is a measurement of distance, typically horizontal.
- **Height** is also a measurement of distance, typically vertical.
- Relationship: Both are types of measurements or dimensions. While related, they don't represent the large vs. small container dynamic found in Barrel : Vial.

Conclusion: Selecting the Best Alternative

Comparing the options to the original pair (**Barrel : Vial**), the relationship of a large container to a small container is best mirrored by the relationship between a large collection of pages (**Book**) and a small collection of pages (**Pamphlet**).

Therefore, the pair **Book : Pamphlet** exhibits the same fundamental relationship as **Barrel : Vial**.

69. Answer: d

Explanation:

Understanding the Analogy: Cream and Cosmetics

The question presents an analogy: **Cream : Cosmetics**. We need to identify the relationship between these two words. A cream is a specific product that falls under the broader category of cosmetics. Therefore, the relationship is that the first word is an example or a type of the second word, which is the general category.

Analyzing the Options for Similar Relationships

Let's examine the relationship between the words in each option:

- **Tiger : Forest**

A tiger is an animal that lives in a forest. The forest is the tiger's habitat or environment. This is different from the example-category relationship.

- **Mountain : Valley**

A mountain and a valley are both geographical features. They often exist in proximity, but one is not a type of the other.

- **Magazine : Editor**

An editor is a person responsible for the content of a magazine. The editor is associated with the creation or management of the magazine, not a type of magazine.

- **Teak : Wood**

Teak is a specific type of wood. Wood is the general category that includes teak. This perfectly matches the relationship identified in the original pair (Cream : Cosmetics).

- (Option 5 is empty and thus not considered.)

Identifying the Best Match Prepp Personal Exams Guide

Comparing the options with the original pair 'Cream : Cosmetics', we find that 'Teak : Wood' exhibits the same relationship. In both cases, the first term is a specific instance or type belonging to the general category represented by the second term.

Therefore, the best alternative that maintains the same relationship is Teak : Wood.

70. **Answer: a**

Explanation:

Understanding the Relationship: Carnivore vs. Herbivore

The question presents a pair of words: **Carnivore** and **Herbivore**. We need to identify the relationship between these two terms and find the option that shares the same relationship.

- A **Carnivore** is an organism, typically an animal, that primarily eats **meat** or flesh. Examples include lions, tigers, and eagles.
- A **Herbivore** is an organism, typically an animal, that primarily eats **plants**. Examples include cows, sheep, and rabbits.

The core relationship between **Carnivore** and **Herbivore** is based on their distinct diets. One eats flesh, and the other eats plants. They represent different categories of consumers based on their food sources.

Analyzing the Options

Let's examine each alternative to see which one best reflects the relationship of dietary difference (eating flesh vs. eating plants):

- **Option 1: Flesh : Plant**
 - **Flesh** is the primary food source for a carnivore.
 - **Plant** is the primary food source for a herbivore.

This option directly represents the food sources associated with the original pair (Carnivore eats Flesh, Herbivore eats Plant). This maintains the relationship based on diet.

- **Option 2: Horse : Lion**
 - A **Horse** is a herbivore.
 - A **Lion** is a carnivore.

This option pairs a herbivore with a carnivore. However, the order is reversed (Herbivore : Carnivore instead of Carnivore : Herbivore), and it lists the animals themselves rather than their diets, which is the defining characteristic in the original pair.

- **Option 3: Camel : Giraffe**
 - A **Camel** is a herbivore.
 - A **Giraffe** is also a herbivore.

This option pairs two herbivores. It does not represent the contrast in diet seen in the original pair.

- **Option 4: Animal : Bird**
 - An **Animal** is a broad biological category.
 - A **Bird** is a specific class within the animal kingdom.

This option represents a general category and a subcategory, not a relationship based on diet.

Conclusion: Selecting the Best Fit

The original pair, **Carnivore : Herbivore**, highlights a contrast in diet – what these animals consume. A carnivore consumes **flesh**, and a herbivore consumes **plants**. Option 1, **Flesh : Plant**, accurately mirrors this relationship by presenting the distinct food sources for each type of consumer.

71. Answer: c

Explanation:

Identifying the Connection: Hamlet, Macbeth, and Faustus

This question challenges us to find a common thread linking three prominent names: **Hamlet**, **Macbeth**, and **Faustus**. We must carefully examine the provided options to select the description that accurately applies to all three figures.

Understanding the Characters: Hamlet, Macbeth, and Faustus

To solve this, let's first clarify the identity and context of each name:

- **Hamlet:** He is the principal character and protagonist in William Shakespeare's renowned tragedy, *Hamlet*. His story unfolds as the Prince of Denmark.
- **Macbeth:** He is the titular character and a central figure in William Shakespeare's tragedy, *Macbeth*. He begins as a Scottish general and eventually becomes king.
- **Faustus:** He is the main character in Christopher Marlowe's play, *Doctor Faustus*. He is depicted as a German scholar who enters into a pact with demonic forces.

Analyzing the Options for Commonality

Let's evaluate each potential commonality presented in the options:

- **Option 1: They were Princes**

Hamlet holds the title of Prince of Denmark. However, **Macbeth** is a military general who later becomes king, not a prince by birthright in the context of the play's main narrative. **Faustus** is portrayed as a scholar. Since the description 'Princes' does not fit all three individuals, this option is incorrect.

- **Option 2: They are plays by Shakespear**

William Shakespeare penned the famous tragedies featuring **Hamlet** and **Macbeth**. However, **Faustus** originates from the play *Doctor Faustus*, which was written by Christopher Marlowe. Because Faustus is not a Shakespearean play, this option is unsuitable as a common characteristic for all three.

- **Option 3: They are characters from various dramas**

Hamlet is a character within Shakespeare's play *Hamlet*. **Macbeth** is a character in Shakespeare's play *Macbeth*. **Faustus** is a character in Marlowe's play *Doctor Faustus*. Each of these names represents a central figure within a dramatic work (a play). This statement accurately captures a fundamental similarity shared by all three.

- **Option 4: They were romantic heroes**

Classifying these figures as "romantic heroes" is debatable and not universally accurate. While **Hamlet** might exhibit traits sometimes associated with romantic protagonists, **Macbeth** is more often seen as a tragic hero whose downfall stems from ambition and moral compromise. **Faustus** is remembered for his deal with the devil and subsequent damnation. Therefore, this description isn't a definitive commonality.

Final Determination of the Shared Trait

After reviewing the options, the most fitting and accurate commonality among **Hamlet**, **Macbeth**, and **Faustus** is that they are all principal characters featured in significant dramatic plays. Option 3 correctly identifies this unifying aspect.

72. Answer: a

Explanation:

Vesuvius, Etna, Kilimanjaro: Understanding Their Connection

This question asks us to identify the common characteristic linking the names **Vesuvius**, **Etna**, and **Kilimanjaro** from the given options. We need to analyze each name and find what they share.

Vesuvius: A Famous Volcano

Vesuvius is a well-known volcano located in Naples, Italy. It is famous for its catastrophic eruption in 79 AD, which buried the ancient Roman cities of Pompeii and Herculaneum.

Etna: Europe's Highest Active Volcano

Etna is situated on the east coast of Sicily, Italy. It is currently one of Europe's most active volcanoes and also the highest peak in Italy south of the Alps.

Kilimanjaro: Africa's Highest Peak

Kilimanjaro is a dormant volcano located in Tanzania, Africa. It is the highest mountain in Africa and the highest single free-standing mountain in the world. Although dormant, its geological classification is that of a volcano.

Commonality: Identifying the Shared Feature

By examining each term, we find that:

- Vesuvius is a volcano in Italy.
- Etna is a volcano in Italy.
- Kilimanjaro is a volcano in Tanzania.

Therefore, the most significant feature that **Vesuvius**, **Etna**, and **Kilimanjaro** have in common is that they are all significant **volcanoes** or volcanic sites.

Option Analysis: Determining the Best Description

Let's evaluate the provided options based on this commonality:

- **Option 1: These are sites of volcanoes** – This statement accurately describes all three names. Vesuvius and Etna are famous volcanoes in Italy, and Kilimanjaro is a prominent volcano in Tanzania. This option correctly captures the shared characteristic.
- **Option 2: These are island countries** – This is incorrect. While Sicily (near Etna and Vesuvius) is an island, none of the terms represent island countries. Kilimanjaro is on the mainland of Tanzania.
- **Option 3: These are hills of Italy** – This is incorrect. Only Vesuvius and Etna are associated with Italy. Furthermore, they are specifically known as volcanoes, not just generic hills. Kilimanjaro is located in Tanzania, not Italy.
- **Option 4: These lie in polar region** – This is incorrect. Vesuvius and Etna are in temperate southern Europe, and Kilimanjaro is in tropical east Africa. None are located in the polar regions.

Based on the analysis, the most appropriate description that unites Vesuvius, Etna, and Kilimanjaro is that they are all sites associated with volcanoes.

73. Answer: d

Explanation:

Understanding the Commonality: Knot, Watt, and Fathom

The question asks us to identify the common characteristic among the three bold words: **Knot**, **Watt**, and **Fathom**. We need to choose the most appropriate description from the given options.

Defining Each Term

Let's define each term to understand its meaning and application:

- **Knot:** A *knot* is primarily used as a unit of speed. Specifically, it represents one nautical mile per hour. It is commonly used in maritime navigation and aviation for measuring the speed of ships and aircraft.
- **Watt:** A *watt* is the standard unit of power in the International System of Units (SI). It is defined as the energy transfer rate of one joule per second. It is most commonly associated with electrical power, measuring how quickly electrical energy is used or generated.
- **Fathom:** A *fathom* is a unit of length, typically used to measure the depth of water in nautical contexts. One fathom is equal to 6 feet (approximately 1.83 meters).

Analyzing the Options

Now, let's evaluate each option based on the definitions of **Knot**, **Watt**, and **Fathom**:

- **Option 1: The terms are used by sailors**
 - *Knot* is extensively used by sailors for speed.
 - *Fathom* is used by sailors to measure water depth.

- *Watt* is related to electrical power and is not a term typically used by sailors in their primary duties.

Since 'Watt' is not commonly used by sailors, this option is not the best fit.

- **Option 2: The terms are used for installing electricity**

- *Watt* is directly related to electrical power measurement.
- *Knot* measures speed, not electricity.
- *Fathom* measures length/depth, not electricity.

Only 'Watt' is related to electricity. Therefore, this option is incorrect.

- **Option 3: The terms are connected with rope**

- *Knot* is often associated with tying ropes.
- *Fathom* has historical links to rope length used in sounding lines.
- *Watt* has no direct connection to ropes.

While 'knot' and historically 'fathom' might have connections to ropes, 'watt' does not. This is not the primary commonality.

- **Option 4: They are units of measurement**

- *Knot* is a unit of speed.
- *Watt* is a unit of power.
- *Fathom* is a unit of length (depth).

All three terms – **Knot**, **Watt**, and **Fathom** – represent distinct units used for measuring different physical quantities (speed, power, and length, respectively). This is the most accurate and encompassing common description.

Conclusion

The most appropriate description that unites **Knot**, **Watt**, and **Fathom** is that they are all units of measurement. Each measures a different quantity, but their fundamental role is quantification.

74. Answer: a

Explanation:

Exploring ****Barauni****, ****Digboi****, and ****Ankleshwar****: Finding the Common Link

This question asks us to identify the shared characteristic among three specific locations: Barauni, Digboi, and Ankleshwar. We need to examine the significance of each place and compare it with the descriptions provided in the options to find the most fitting commonality.

Understanding ****Barauni****

Barauni is a significant industrial town located in the Begusarai district of Bihar. It is primarily known for its major industrial establishments, including a large oil refinery.

Understanding ****Digboi****

Digboi, situated in the Tinsukia district of Assam, holds a unique place in India's industrial history. It is renowned for being the location of Asia's oldest oil refinery and one of the oldest oil fields still in operation.

Understanding ****Ankleshwar****

Ankleshwar is a city in the Bharuch district of Gujarat. It is a major industrial hub, particularly known for its large number of chemical and pharmaceutical industries, which are closely linked to the petroleum sector and its by-products. It is also considered one of the most polluted industrial areas.

Identifying the ****Common Link****

Upon reviewing the key features of Barauni, Digboi, and Ankleshwar, a prominent common element emerges:

- **Barauni:** Hosts a major oil refinery.
- **Digboi:** Famous for Asia's oldest oil refinery and oil fields.
- **Ankleshwar:** A major industrial city with significant chemical industries often associated with petroleum processing.

Therefore, the most significant shared characteristic is their strong association with the oil industry, specifically oil fields and refineries.

Evaluating the ****Given Options****

Let's analyze each option based on the established commonality:

- **Option 1: They are famous for oil fields**
This statement accurately reflects the primary industrial significance of all three locations. Digboi is directly known for its oil fields, while Barauni and Ankleshwar are major centers for oil refining and petrochemical industries, intrinsically linked to oil resources.
- **Option 2: They are famous religious places**
While these places might have religious sites, their primary fame and recognition do not stem from being major religious centers. This option is not the most appropriate description of their shared identity.
- **Option 3: They are tourist places of South India**
This option is incorrect on two counts. Firstly, the common characteristic is not tourism. Secondly, Barauni (Bihar) and Digboi (Assam) are located in Eastern India, not South India. Ankleshwar is in Western India.
- **Option 4: They are famous for handlooms**
None of these locations are primarily renowned for their handloom industries. Their fame lies predominantly in their industrial contributions, particularly related to oil and petrochemicals.

Conclusion on ****Location Significance****

Based on the analysis, the most fitting description that encompasses the common characteristic of Barauni, Digboi, and Ankleshwar is their fame related to oil fields and the associated petroleum industry.

75. Answer: c

Explanation:

Understanding the Commonality of Knight, Rook, and Bishop

The question asks us to identify the common characteristic shared by the three words presented in bold: Knight, Rook, and Bishop. We need to choose the most fitting description from the given alternatives.

Exploring the Terms: Knight, Rook, Bishop

Let's consider each term:

- **Knight:** In the context of games, a Knight is a piece that moves in a unique 'L' shape (two squares in one direction and then one square perpendicular).
- **Rook:** A Rook is a piece typically shaped like a castle tower, which moves horizontally or vertically any number of unoccupied squares.
- **Bishop:** A Bishop is a piece that moves diagonally any number of unoccupied squares.

Identifying the Shared Context: Chessmen

When we look at the roles and movements described above, we can see a clear pattern. The terms Knight, Rook, and Bishop are all fundamental pieces used in the strategy board game known as **Chess**.

- Knights, Rooks, and Bishops are distinct types of pieces within the game of Chess.
- Each piece has specific movement rules on the chessboard.
- Together with other pieces like the King, Queen, and Pawns, they constitute the army used to play the game.

Therefore, the most appropriate description for these three words is that they are **chessmen**.

Evaluating the Provided Options

Let's analyze why the other options are less suitable:

- **Option 1: These are movie characters** – While these pieces might be represented as characters in movies related to chess, this is not their primary or defining commonality. Their existence predates and transcends specific movie portrayals.
- **Option 2: These are churchmen** – A Bishop is indeed a high-ranking official in the church. However, a Knight is typically a medieval warrior or nobleman, and a Rook represents a castle tower, neither being church officials. Thus, this description only partially fits and is not common to all three.
- **Option 3: These are chessmen** – As established, Knight, Rook, and Bishop are all pieces belonging to the game of Chess. This description accurately encompasses all three terms.
- **Option 4: These are ranks of military** – Historically, a Knight was a rank in feudalism, often associated with military service. However, Rook and Bishop are not military ranks. Therefore, this is not a common characteristic.

Conclusion on Chessmen

Based on the analysis, the terms Knight, Rook, and Bishop are all pieces used in the game of Chess. Option 3 correctly identifies this shared identity, making them **chessmen**.

76. Answer: d

Explanation:

Bhattacharya, Dutt, Ray: Identifying a Shared Trait

This question focuses on finding a common characteristic among three prominent personalities: Abhi Bhattacharya, Utpal Dutt, and Satyajit Ray. We need to carefully examine their backgrounds and contributions to select the most fitting description from the given alternatives.

Bengal Connections of Bhattacharya, Dutt, and Ray

Let's understand the background of each individual and their connection to Bengal:

- **Abhi Bhattacharya:** Primarily known as an actor, Abhi Bhattacharya was born in Bengal and actively participated in Bengali cinema and theatre. His career was rooted in the cultural environment of Bengal.
- **Utpal Dutt:** A highly influential figure in Indian arts, Utpal Dutt was a Bengali actor, director, and playwright. His work profoundly impacted Bengali theatre and cinema.
- **Satyajit Ray:** Globally celebrated filmmaker Satyajit Ray was a native of Bengal. His iconic Bengali films brought international acclaim to Indian cinema and showcased Bengali culture.

Commonality Descriptions for Bhattacharya, Dutt, Ray

Now, let's evaluate each option based on the commonalities observed:

- **Option 1: They are character actors**

Abhi Bhattacharya and Utpal Dutt were indeed accomplished actors. However, Satyajit Ray was primarily a director and writer, not an actor. This description does not accurately apply to all three.

- **Option 2: They are directors of Bengali movies**

Satyajit Ray is a legendary director, and Utpal Dutt also directed films. But Abhi Bhattacharya was mainly recognized for his acting roles. This option is not a universal fit.

- **Option 3: They are famous poets and writers**

Utpal Dutt was a playwright, and Satyajit Ray was a noted writer. Abhi Bhattacharya's primary fame comes from acting, not from writing or poetry. Thus, this is not the most suitable commonality.

- **Option 4: These personalities belong to Bengal**

This statement is accurate for all three. Abhi Bhattacharya, Utpal Dutt, and Satyajit Ray share a strong connection to Bengal, being integral to its rich cultural and artistic heritage, particularly in the fields of cinema and theatre.

Bengal as the Common Link for Bhattacharya, Dutt, and Ray

The most defining shared characteristic among Abhi Bhattacharya, Utpal Dutt, and Satyajit Ray is their deep association with **Bengal**. Their significant contributions to arts and culture are intrinsically linked to this region, making this the most appropriate commonality.

77. Answer: b

Explanation:

Analyzing the Commonality in Voodoo, Sorcery, and Necromancy

The question asks us to identify the common characteristic shared by the three given words: **Voodoo**, **Sorcery**, and **Necromancy**. We need to choose the most appropriate description from the provided options.

Understanding the Key Terms

Let's define each term to understand their relationship:

- **Voodoo**: Often referred to as Vodou, it's a religion practiced primarily in Haiti and other parts of the Caribbean. While it involves rituals, spirits, and healing, it is often misrepresented in popular culture as being associated with dark magic or witchcraft.

- **Sorcery:** This term refers to the practice of magic, especially with the intention of causing harm or for malevolent purposes. It is strongly linked to the concept of **black magic**.
- **Necromancy:** This is a specific form of magic involving the supposed invocation or communication with the spirits of the dead, often for the purpose of divination or to gain knowledge. It is also traditionally associated with dark or forbidden practices.

Evaluating the Options for Voodoo, Sorcery, and Necromancy

Now, let's examine each option in relation to these definitions:

Option 1: They are ancient arts found in sculptures

- While Voodoo, Sorcery, and Necromancy might be depicted or referenced in art, including sculptures, this is not their primary characteristic or defining commonality. They are primarily belief systems and magical practices, not artifacts themselves.

Option 2: They are terms connected with black magic

- **Sorcery** and **Necromancy** are directly and traditionally associated with the practice of magic, often considered **black magic** due to their nature or perceived intent.
- **Voodoo**, although a complex religion, is frequently linked to **black magic** in popular perception and cultural portrayals, even if this is a simplification or misrepresentation of the actual religion.
- Therefore, this option accurately captures a significant connection among all three terms.

Option 3: They are ancient scripts

- Scripts refer to writing systems (e.g., Latin script, Cyrillic script). Voodoo, Sorcery, and Necromancy are practices, rituals, or belief systems, not forms of writing.

Option 4: They are means of communication of pre-historic age

- These terms relate to magical practices and religious beliefs, not methods of communication used during the pre-historic era. Communication methods from that time would involve early language, gestures, etc.

Conclusion on Voodoo, Sorcery, and Necromancy

Comparing the options, the most fitting description for **Voodoo**, **Sorcery**, and **Necromancy** is that they are terms connected with **black magic**. This highlights the shared association, whether direct or perceived, with magical practices often categorized as dark or malevolent.

78. Answer: a

Explanation:

Commonality Analysis: Rourkela, Bokaro, Durgapur

The question presents three city names in bold: **Rourkela**, **Bokaro**, and **Durgapur**. The task is to determine the common characteristic shared by these three cities from the provided list of options.

Significance of Rourkela, Bokaro, and Durgapur

To find the commonality, let's look at the key features associated with each city:

- **Rourkela**: This city, located in Odisha, is renowned for hosting the **Rourkela Steel Plant** (RSP), one of India's major steel manufacturing facilities.
- **Bokaro**: Situated in Jharkhand, **Bokaro** is primarily known for the **Bokaro Steel Plant** (BSL), a significant integrated steel plant contributing heavily to India's steel production.
- **Durgapur**: Located in West Bengal, **Durgapur** is a major industrial city, often referred to as the "Ruhr of India," largely because it houses the **Durgapur Steel Plant** (DSP) along with other key industries.

Evaluating the Options for Commonality

We will now assess each option based on the characteristics of these three cities:

- **Option 1: They are steel plants**

This statement correctly identifies the most prominent common feature.

Rourkela, Bokaro, and Durgapur are all cities distinguished by the presence of major **steel plants** integral to their identity and economy.

- **Option 2: They have coal mines**

While coal is a crucial raw material for steel production and might be available in the broader regions, these specific cities are not primarily known as coal mining centres. Their main identity is linked to steel production, not coal extraction.

- **Option 3: They have atomic power plants**

Atomic power generation is not a defining characteristic of **Rourkela, Bokaro, or Durgapur**. Their industrial significance lies elsewhere.

- **Option 4: They are on the sea coast**

All three cities, **Rourkela, Bokaro, and Durgapur**, are situated inland and are not located on any sea coast.

Final Conclusion

The analysis confirms that the shared characteristic among **Rourkela, Bokaro, and Durgapur** is their status as important industrial hubs housing significant **steel plants**.

79. Answer: d

Explanation:

Spinach, Fenugreek, and Celery Classification

This question asks us to identify the common characteristic shared by three specific plants: **Spinach**, **Fenugreek**, and **Celery**. We need to choose the best description from the given options.

Understanding the Plants: Spinach, Fenugreek, and Celery

Let's look at each plant individually:

- **Spinach:** This is a well-known green vegetable. The main edible part is its leaves, which are typically eaten cooked or raw in salads and dishes. It's highly valued for its nutritional content, including iron and vitamins.
- **Fenugreek:** Fenugreek is an herb. While its seeds are famous as a spice, its leaves (often called 'methi' in many cuisines) are widely used as a vegetable. These leaves have a distinct flavour and aroma and are a common ingredient in various dishes.
- **Celery:** Celery is often recognized for its crunchy stalks, which are eaten as a vegetable. However, its leaves are also edible and are sometimes used in soups, stews, or as a flavouring herb.

Identifying the Shared Trait: Leafy Vegetables

The common feature linking **Spinach**, **Fenugreek**, and **Celery** is that they are all primarily considered **leafy vegetables**. This means their leaves are the principal part consumed by humans as food.

- Spinach: Leaves are the main edible part.
- Fenugreek: Leaves are used extensively as a vegetable.
- Celery: While stalks are popular, the leaves are also edible and used culinarily.

Therefore, the most appropriate description is that these are **leafy vegetables**.

Evaluating Other Descriptions

Let's examine why the other options are not the best fit:

- **Cactus plants:** Cactus plants are succulents adapted to dry environments and are botanically very different from Spinach, Fenugreek, or Celery. None of the listed plants are cacti.
- **Wild plants:** While Spinach, Fenugreek, and Celery have wild relatives and can sometimes be found growing wild, they are primarily known and cultivated as agricultural crops or garden vegetables. Classifying them solely as 'wild plants' misses their main identity as food sources.
- **Wild flowers:** These plants are not primarily known or grown for their flowers. While they do produce flowers as part of their life cycle, their primary use and recognition in a culinary or common context is not as wildflowers.

Based on this analysis, the classification that accurately describes the commonality among Spinach, Fenugreek, and Celery is that they are **leafy vegetables**.

80. Answer: b

Explanation:

Understanding the Commonality: Yeats, Ghalib, and Kabir

This question asks us to identify the shared characteristic among three prominent figures: Yeats, Ghalib, and Kabir. We need to evaluate the given options to find the most fitting description that unites these individuals.

Profile of the Figures

- **Yeats:** William Butler Yeats was a highly acclaimed Irish poet and Nobel laureate. He is celebrated for his significant contributions to modern poetry.
- **Ghalib:** Mirza Ghalib was a celebrated Urdu and Persian poet, considered one of the most influential literary figures of the Mughal era.
- **Kabir:** Kabir Das was a mystic poet and saint from India. While primarily known as a spiritual leader, his verses (dohas and songs) are famous for their poetic

quality and spiritual depth, making him a significant figure in devotional poetry.

Evaluating the Options

Let's examine each option in relation to Yeats, Ghalib, and Kabir:

- **Option 1: They were social**

While all three individuals likely had social impacts through their work and lives, this description is very broad. It doesn't specifically capture their primary shared identity or contribution.

- **Option 2: They were famous poets**

Yeats is globally recognized as a major poet. Ghalib is revered as one of the greatest poets in Urdu and Persian literature. Kabir, although also a saint, is immensely famous for his poetic compositions that conveyed profound spiritual and philosophical ideas. This option accurately describes all three.

- **Option 3: They were saints**

Kabir is widely regarded as a saint. However, Yeats, while interested in mysticism, is not typically classified as a saint. Ghalib was primarily known as a poet, not a spiritual figure or saint. Therefore, this option does not apply to all three.

- **Option 4: They were yoga instructors**

There is no historical basis or common knowledge suggesting that Yeats, Ghalib, or Kabir were yoga instructors.

Conclusion on Shared Identity

Based on the analysis, the most accurate and specific commonality among Yeats, Ghalib, and Kabir is their status as **famous poets**. Their poetic works have left a lasting legacy in literature and culture across different regions and languages.

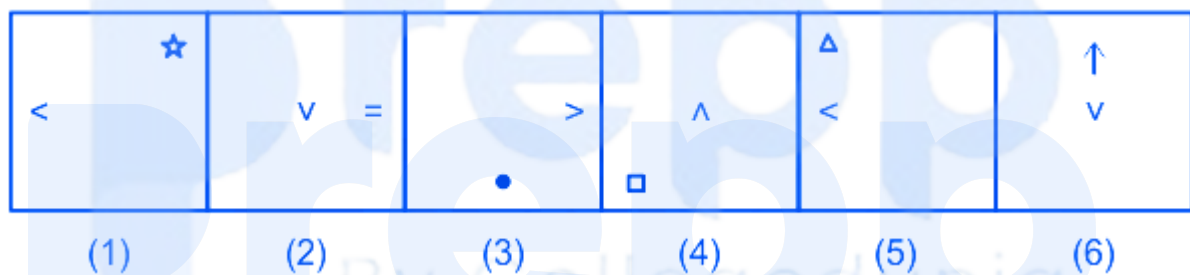
81. Answer: a

Explanation:

The pattern followed here is:

- 1) The arrow symbol in the first image is facing opposite direction as compared to the arrow in third image, arrow in second image is facing opposite direction as compared to arrow in fourth image, so definitely, the next image in the series will have arrow facing in opposite direction as compared to the arrow in fourth image.
- 2) If we observe the symbols other than arrow, they are showing clockwise movement one and two place alternatively.

So, the symbol in the figure that will continue the series must be at the north-east corner of the figure.



Hence, the correct answer is "Option 1".

82. Answer: d

Explanation:

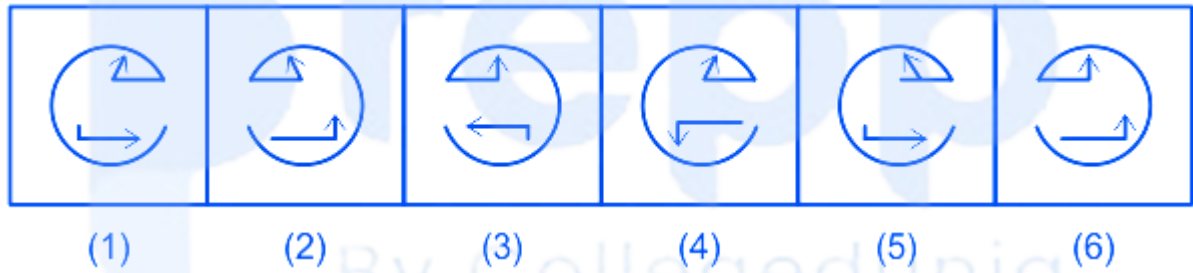
The pattern followed here is:

- 1) If we observe the movement of arrow the inside the circle, we see that it is showing movement in anti-clockwise direction. So, the next image that will continue the series must have the arrow line facing north as shown in option 3 and 4.

In option 3, the small arrow is not attached with the circle, while in the entire series small arrow is attached with the circle.

So, it cannot be the correct answer figure.

Therefore, the next figure in the series will be option 4, as shown below.



Hence, the correct answer is "Option 4".

83. Answer: d

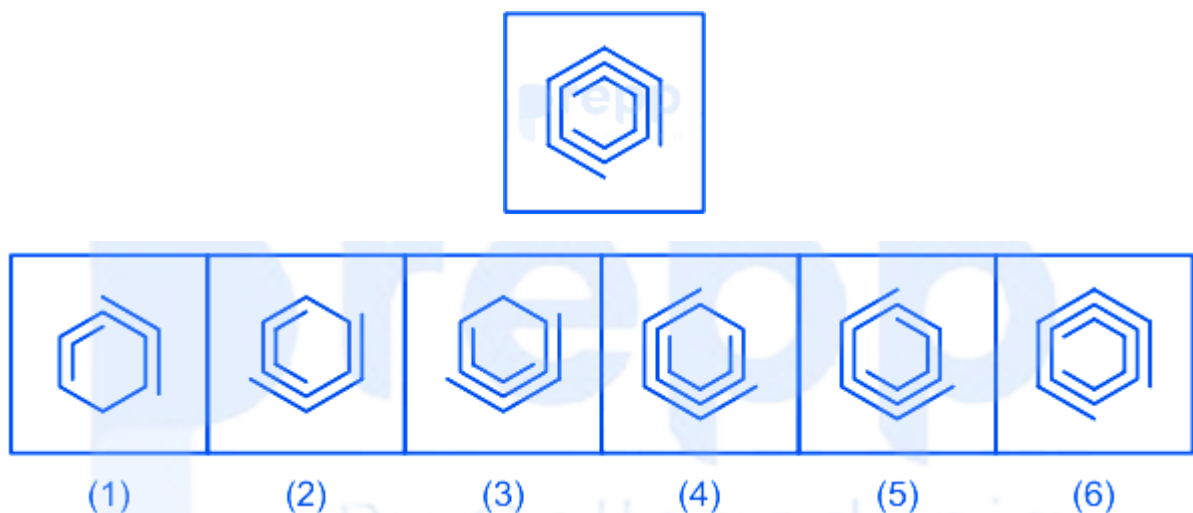
Explanation:

The pattern followed here is:

For Outer hexagon: One line is added in 2) step and hexagon moves one place clockwise. It is remain same in 3). One line is added in 4) step and hexagon moves one place clockwise. It is remain same in 5). One line is added in coming step and hexagon moves one place clockwise.

For innermost hexagon: In each alternative step one line is added and in other step it moves one step anticlockwise.

So, definitely, the next figure there must be 5 lines, as shown in option 4.



Hence, 'option 2' is the correct answer.

84. Answer: b

Explanation:

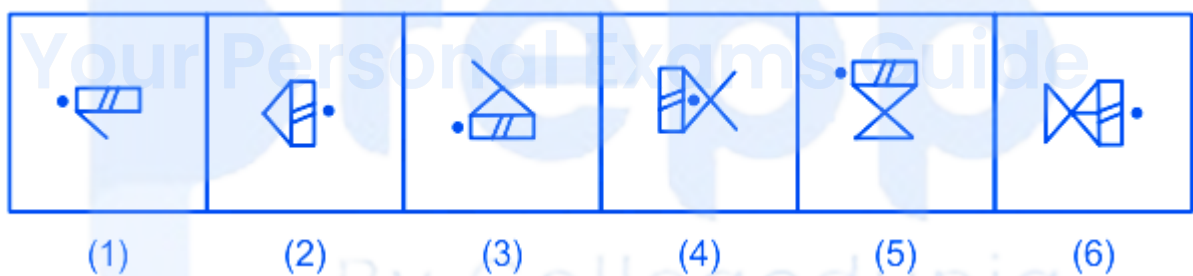
The pattern followed here is:

1) In figures (1), (3) and (5), the pattern of arrangement of rectangular box and the small shaded dot is same, the small change is that number of lines in the figure increases with each step.

2) In figures (2) and (4), the pattern of arrangement of rectangular box and the small shaded dot is same, so, the figure that will continue the series must have same arrangement of rectangular box and the small shaded dot, as shown in option 2 and 4.

But in option (4), the figure has two lines extra as compared to figure (5). So, it cannot be the correct answer as there should be an increase of one line only.

So, definitely, option (2) will continue the figure series.



Hence, the correct answer is "Option 2".

85. Answer: c

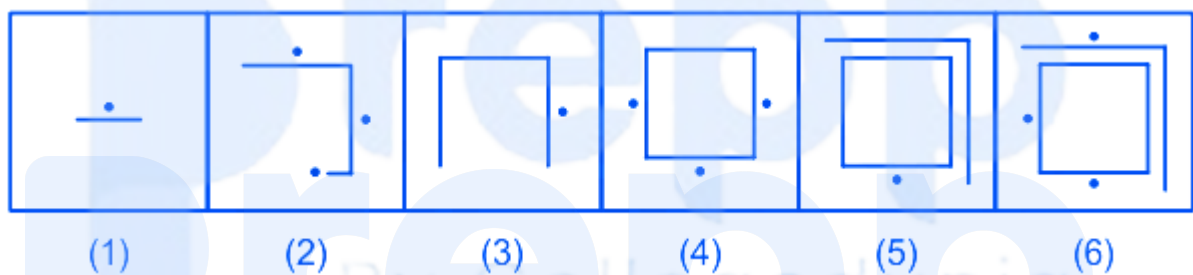
Explanation:

1) In figures (1), (3) and (5), we see that the 'dot' in the figures moves in clockwise direction.

2) Again in figures (2) and (4), the 'dot' in the figures moves in clockwise direction. So, the next figure that will continue the series must have dots in the pattern as in options (1) and (3).

3) Again, the lines outside the square will continue in the pattern similar to figure (5).

So, option 3 will continue the series.



Hence, the correct answer is "Option 3".

86. Answer: d

Explanation:

In figure (X),

1) The dot lies in the region common to the rectangle and circle only.

On observing the given options carefully, we get:

Option (1)



Here, dot doesn't lie in the region common to the rectangle and circle only.

Option (2)



Here, dot doesn't lies in the region common to the rectangle and circle only.

Option (3)



Here, dot doesn't lies in the region common to the rectangle and circle only.

Option (4) All required conditions are fulfilled.



Here, dot lies in the region common to the rectangle and circle only.

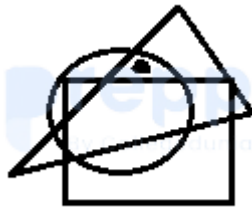
Only figure (4) consists of the same type of region.

Hence, the correct answer is "option (4)".

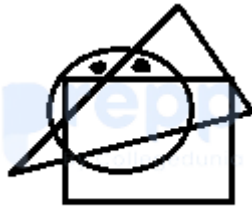
87. Answer: c

Explanation:

In figure (X), one dot lies in the region common to circle and triangle only



And the other dot lies in the region of circle only.



Only 'option 3' consists of both the type of regions.



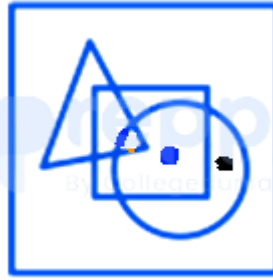
Hence, 'option 3' is the correct one.

88. Answer: c

Explanation:

In figure (X), one dot lies in the region common to circle and triangle only, one dot lies in the region of circle only and one dot lies in the region of circle and square only.

(1):



One dot lies in the region of circle only and one dot lies in the region of circle and square only.

(2):



One dot lies in the region common to circle and triangle only, one dot lies in the region of circle only.

(3):



Only this option consists of all the three type of regions.

(4):



One dot lies in the region common to circle and triangle only and one dot lies in the region of circle and square only.



Hence, 'option 3' is the correct one.

89. Answer: b

Explanation:

In figure (X), one dot lies in the region common to circle, square and rectangle only, one dot lies in the region common to triangle, rectangle and circle only and one dot lies in the region common to all the given shapes given. Only 'option 2' consists of all the three type of regions.

(1):



One dot lies in the region common to circle, square and rectangle only and one dot lies in the region common to all the given shapes given.

(2):



Only this figure consists all types of regions.

(3):



None of dots lies in this figure.

(4):



One dot lies in the region common to circle, square and rectangle only and one dot lies in the region common to triangle, rectangle and circle only.

As only option (2) consists all types of regions .



Hence, 'option 2' is the correct one.

90. Answer: d

Explanation:

In figure (X), one dot lies in the region common to circle and square only, one dot lies in the region common to triangle and rectangle only and one dot lies in the

region common to circle and rectangle only.

(1):



One dot lies in the region common to triangle and rectangle only and one dot lies in the region common to circle and rectangle only.

(2):



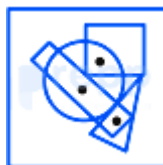
One dot lies in the region common to circle and square only and one dot lies in the region common to circle and rectangle only.

(3):



One dot lies in the region common to circle and square only and one dot lies in the region common to circle and rectangle only.

(4):



Only 'option 4' consists of all the three type of regions.



Hence, 'option 4' is the correct one.

91. Answer: d

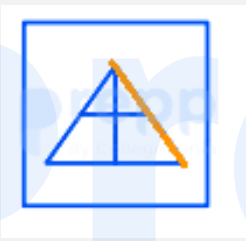
Explanation:

The option figure in which the given figure is embedded is shown below:



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No.	Options	Question	Answer
1.			Not Embedded
2.			Not Embedded
3.			Not Embedded
4.			Embedded

Hence, 'the correct answer is"option (4)".

92. Answer: d

Explanation:

The option figure in which the given figure is embedded is shown below:

No.	Option	Question	Answer
1.			Not Embedded
2.			Not Embedded
3.			Not Embedded
4.			Embedded

Hence, the correct answer is "option (4)".

93. Answer: d

Explanation:

The option figure in which the given figure is embedded is shown below:



No.	Option	Question	Answer
1.			Not Embedded
2.			Not Embedded
3.			Not Embedded
4.			Embedded

Hence, the correct answer is "option (4)".

94. Answer: d

Explanation:

The option figure in which the given figure is embedded is shown below:



No.	Option	Question	Answer
1.			Not Embedded
2.			Not Embedded
3.			Not Embedded
4.			Embedded

Hence, the correct answer is "option (4)".

95. Answer: b

Explanation:

The option figure in which the given figure is embedded is shown below:

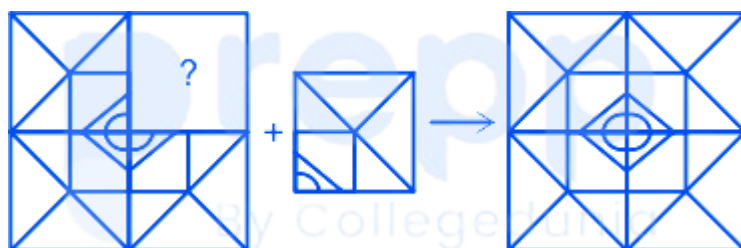
No.	Option	Question	Answer
1.			Not Embedded
2.			Embedded
3.			Not Embedded
4.			Not Embedded

Hence, the correct answer is "option (2)"

96. Answer: c

Explanation:

The figure that best completes the pattern given is shown below:

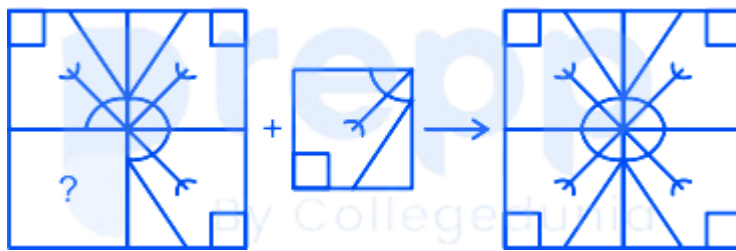


Hence, the correct answer is "Option (3)".

97. Answer: d

Explanation:

The figure that best completes the pattern given is shown below:

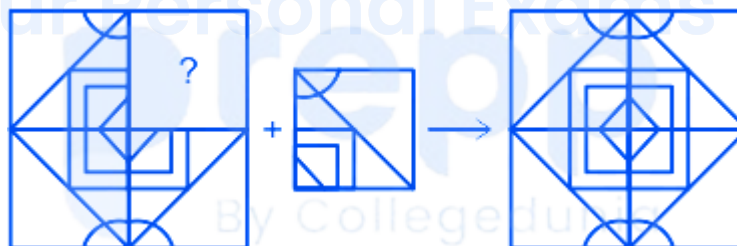


Hence, the correct answer is "Option (4)".

98. Answer: a

Explanation:

The figure which complete the pattern of question figure is given below:

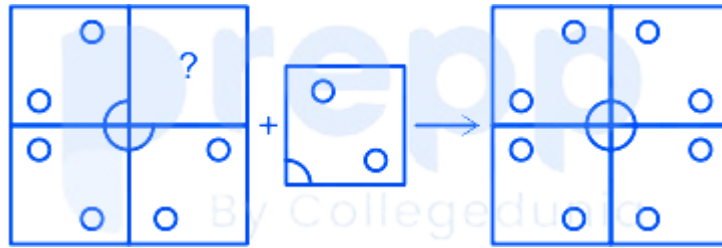


Hence, the correct answer is "option (1)".

99. Answer: b

Explanation:

The figure which complete the pattern of question figure is given below:

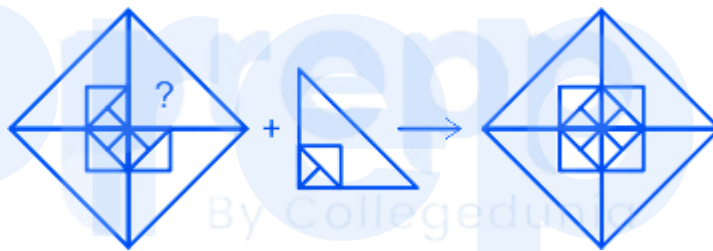


Hence, the correct answer is "option (2)".

100. Answer: a

Explanation:

The figure which complete the pattern of question figure is given below:



Hence, the correct answer is "option (1)".

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