

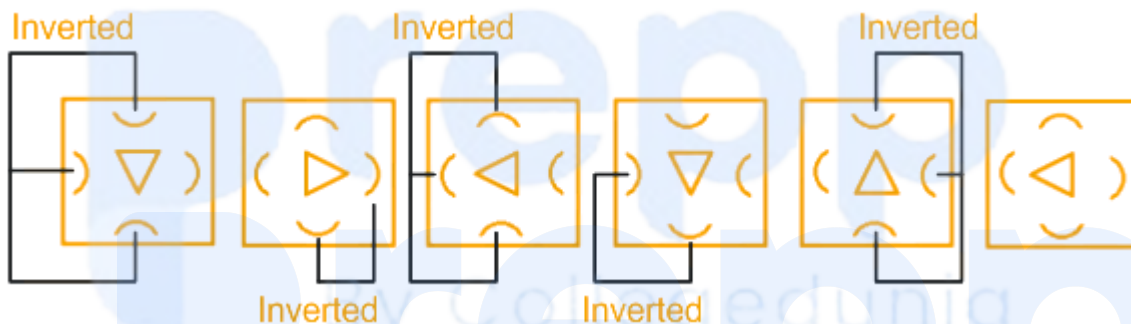
Answers

1. Answer: c

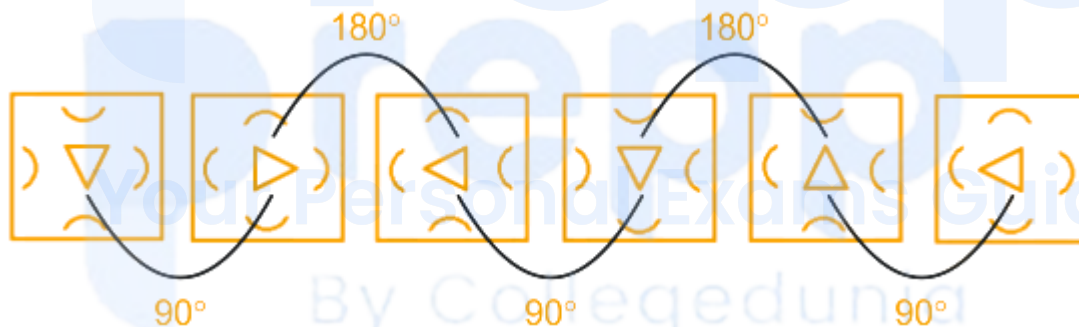
Explanation:

The logic followed here is:

1) Three and two arcs are **inverted** alternately.



2) The central element rotates 90° and 180° **anti-clockwise** alternately.



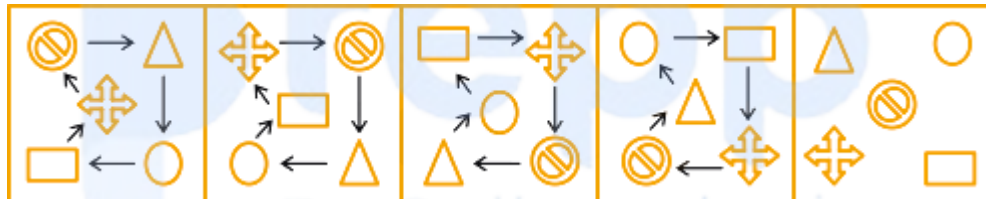
Hence, **option (3)** is the next image in the series.

2. Answer: b

Explanation:

The figures are shifting according to a pattern here.

- 1) The figure at the bottom left corner is shifted to the middle position in every next step
- 2) All the other figures are shifted in the clockwise direction.
- 3) The middle figure moves to the top left corner.



According to this pattern next figure is:

Hence, "Option (2)" is the next image in the series.

3. Answer: c

Explanation:

The logic followed here is:

- 1) On the left side, one straight line is added to complete the triangle. After that construction starts on the right side but from the bottom.
- 2) With every step, one straight line is added to the figure, making sure that the newly formed figure is the mirror image of one of the existing figures on the left.

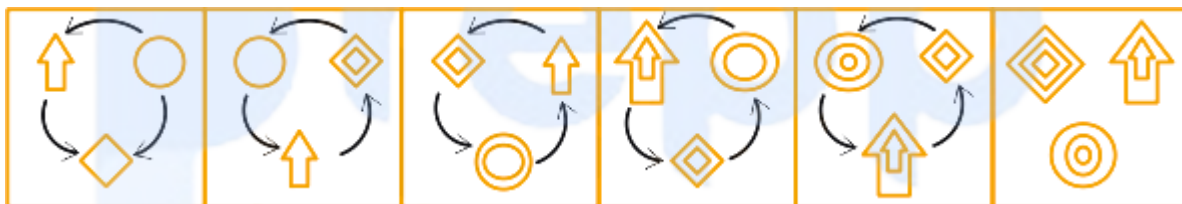


Hence, the correct answer is "Option 3".

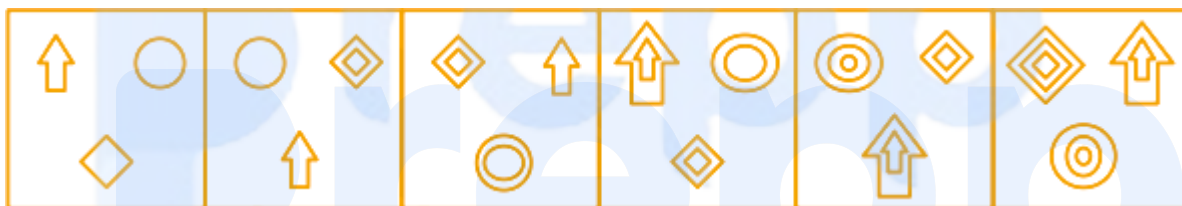
4. Answer: b

Explanation:

The figures are rotated in the anticlockwise direction.



In each step, one figure is enclosed by another similar figure.



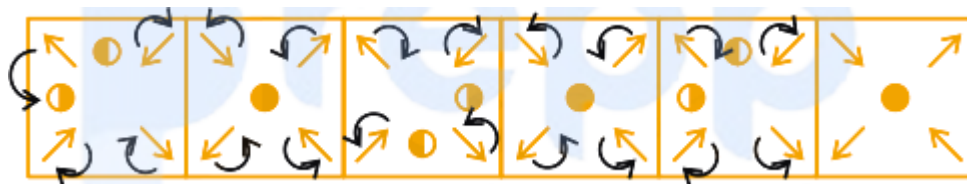
Hence, option (2) is the next image in the series.

5. Answer: c

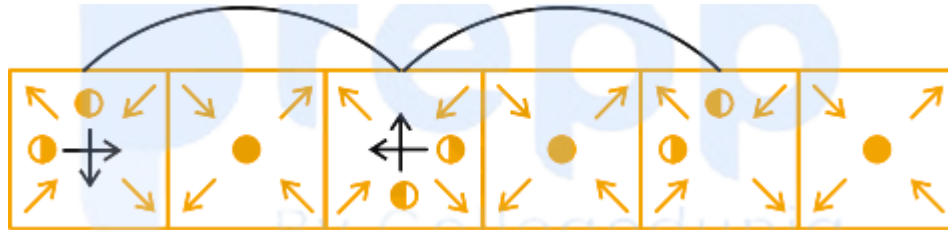
Explanation:

The logic followed here is:

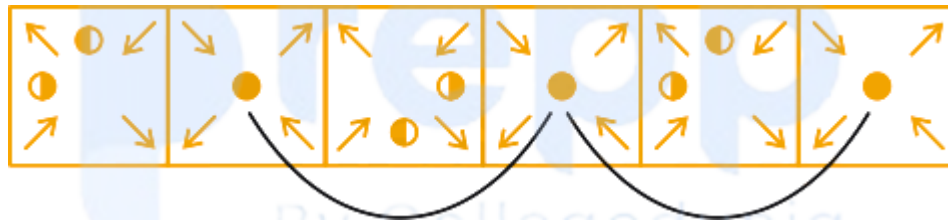
1) The arrows in the corners are changing directions alternately.



2) The circle shaded at the right is moving horizontally whereas the circle shaded at the left is moving vertically in the odd-numbered positions.



3) There is a filled circle in each even-numbered step.



From the above diagram we get the next diagram

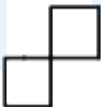


Hence the correct answer is option 3.

6. Answer: d

Explanation:

The question figure is embedded in,

No.	Option	Question	Answer
1.			Not Embedded
2.			Not Embedded
3.			Not Embedded
4.			Embedded

Hence, the correct answer is "option (4)".

7. Answer: c

Explanation:

Decoding the RAKESH to TCMGUJ Transformation

The question asks us to determine the coded form of the word PRAKASH, given that RAKESH is coded as TCMGUJ. This is a typical letter-coding problem where we need to find the relationship between the letters of the original word and its coded form.

Finding the Pattern in RAKESH to TCMGUJ

Let's compare the original word "RAKESH" with its coded version "TCMGUJ" letter by letter to identify the pattern:

- The first letter **R** in RAKESH corresponds to **T** in TCMGUJ.
- The second letter **A** in RAKESH corresponds to **C** in TCMGUJ.
- The third letter **K** in RAKESH corresponds to **M** in TCMGUJ.
- The fourth letter **E** in RAKESH corresponds to **G** in TCMGUJ.
- The fifth letter **S** in RAKESH corresponds to **U** in TCMGUJ.
- The sixth letter **H** in RAKESH corresponds to **J** in TCMGUJ.

Analyzing the Alphabetical Shift

To understand the transformation rule, we can look at the position of each letter in the English alphabet and calculate the shift:

- **R** is the 18th letter. **T** is the 20th letter. The shift is $20 - 18 = +2$.
- **A** is the 1st letter. **C** is the 3rd letter. The shift is $3 - 1 = +2$.
- **K** is the 11th letter. **M** is the 13th letter. The shift is $13 - 11 = +2$.
- **E** is the 5th letter. **G** is the 7th letter. The shift is $7 - 5 = +2$.
- **S** is the 19th letter. **U** is the 21st letter. The shift is $21 - 19 = +2$.
- **H** is the 8th letter. **J** is the 10th letter. The shift is $10 - 8 = +2$.

The analysis reveals a consistent pattern: each letter in the word RAKESH is shifted forward by 2 positions in the alphabet to get the coded word TCMGUJ.

Applying the Coding Pattern to PRAKASH

We now apply the same rule (shifting each letter forward by 2 positions) to the word PRAKASH:

- **P** (16th letter) + 2 positions results in the 18th letter, which is **R**.
- **R** (18th letter) + 2 positions results in the 20th letter, which is **T**.
- **A** (1st letter) + 2 positions results in the 3rd letter, which is **C**.
- **K** (11th letter) + 2 positions results in the 13th letter, which is **M**.
- **A** (1st letter) + 2 positions results in the 3rd letter, which is **C**.

- S (19th letter) + 2 positions results in the 21st letter, which is U.
- H (8th letter) + 2 positions results in the 10th letter, which is J.

Constructing the Coded Word for PRAKASH

By combining the resulting letters, the coded word for PRAKASH is found to be:

RTCMCUJ

Matching the Result with Given Options

We compare the derived coded word "RTCMCUJ" with the options provided:

Option	Coded Word
1	RMCKLNI
2	RKCMCJI
3	RTCMCUJ
4	RNCKJIH

The coded word we found, RTCMCUJ, exactly matches Option 3.

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8. Answer: c

Explanation:

The figure which will complete the pattern of the question figure is given below:



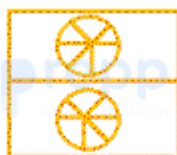
Hence, the correct answer is " option (3)".

9. Answer: c

Explanation:

On observing the figures carefully, we get,

Figure A:



Here, the lower element is the mirror image of the upper element.

Figure B:



Here, the lower element is the mirror image of the upper element.

Figure C:



Here, the lower element is the **not the mirror image** of the upper element.

Figure D:



Here, the lower element is the mirror image of the upper element.

In all the given images except **figure C**, the lower element is the mirror image of the upper element.

So, Figure C is the odd one among the given options.

Hence, the correct answer is "**Figure C**".

10. Answer: b

Explanation:

Some **travellers** travel by **bus**.

Some **travellers** travel by **train**.

Also, there are travellers who use other means of transport.

Therefore, the relationship is best represented by the following Venn diagram:

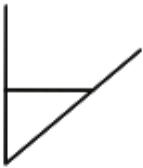
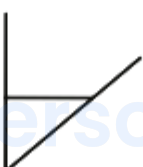


Hence, the correct answer is "**option (2)**".

11. Answer: a

Explanation:

The question figure is embedded in,

No.	Option	Question	Answer
1.			Embedded
2.			Not Embedded
3.			Not Embedded
4.			Not Embedded

Hence, the correct answer is "option (1)".

12. Answer: c

Explanation:

We have checked each Image:

Image (A):



Here, Pentagon contain as many lines inside it as the number of sides in it

Image (B):



Here, Triangle contain as many lines inside it as the number of sides in it

Image (C):



Here, Hexagon contain as many lines inside it as the number of sides in it

Image (D):



Here, Rectangle have 4 sides but it have 5 lines inside it.

So, Image (D) is the odd one among the given images.

Hence, the correct answer is "Image (D)".

13. Answer: b

Explanation:

Understanding the Relationship: Country and President

The question asks us to find a word related to **State** in the same way that **President** is related to **Country**. This is a word analogy problem.

First, let's look at the given pair: **Country** : **President**.

In many political systems, the **President** is the head of state for a **Country**. They often hold the highest position of authority and represent the nation.

Identifying the Analogy Pattern

The pattern identified is: [Political Entity] : [Head of that Entity].

We need to apply this pattern to the second part of the analogy: **State** : ?

We are looking for the head of a **State**.

Analyzing the Options for Head of State

Let's examine each option to see which one fits the role of the head of a **State**:

- **Minister**: A minister typically heads a specific department within a government (like Minister of Health or Minister of Finance). They are part of the executive branch but are not usually the single head of the entire state.
- **Governor**: In many countries, especially those with a federal structure (like India or the United States), a **Governor** is the chief executive of a **State** and acts as the official head of that state. This closely matches the role of a **President** at the national level.
- **Officer**: This is a broad term for someone who holds a position of responsibility. It does not specifically refer to the head of a state.

- **Mayor:** A **Mayor** is the head of a city or municipality, which is a smaller administrative division than a state.

Comparing Roles

Here's a simple comparison:

Entity	Head Role
Country	President (Head of State)
State	Governor (Head of State)
City/Town	Mayor (Head of Local Government)

Conclusion

The **President** leads a **Country**, and similarly, a **Governor** leads a **State**. Therefore, **Governor** is the correct answer that fits the analogy.

14. Answer: b

Explanation:

On observing the figure carefully, we get;

Figure A:



Number of parts of the figure is an **even** number.

Figure B:



Number of parts of the figure is an **odd** number.

Figure C:



Number of parts of the figure is an **even** number.

Figure D:



Number of parts of the figure is an **even** number.

In all the given figures except Figure B, number of parts of the figure is an odd number.

So, Figure B is the odd one among the given options.

Hence, the correct answer is **"Figure B"**.

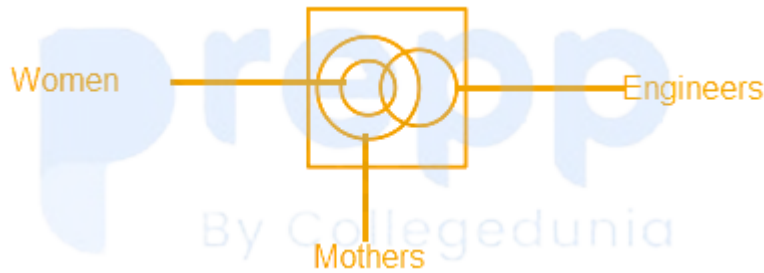
15. Answer: d

Explanation:

All mothers are women.

Some mothers, as well as some women, are engineers.

This relationship is best represented by the following Venn diagram:



Hence, the correct answer is "option (4)".

16. Answer: b

Explanation:

This problem requires us to identify a hidden pattern or **system** used to solve the given equations and then apply that same **system** to find the answer for the unsolved equation. Let's break down the process step-by-step.

Equations System Analysis

We are given two examples of how the equations are solved:

- $10 \times 2 = 8$
- $14 \times 4 = 10$

We need to figure out the rule that connects the numbers on the left side (10, 2) to the result on the right side (8), and similarly for the second equation (14, 4 leading to 10).

Analyzing Given Equations

Let's examine the first equation: $10 \times 2 = 8$.

- If we perform standard multiplication, 10 multiplied by 2 is 20, which is not 8.

- Let's try subtraction: $10 - 2 = 8$. This matches the result given in the first equation.

Now, let's check if this subtraction pattern holds true for the second equation: $14 \times 4 = 10$.

- Using the subtraction pattern: $14 - 4 = 10$.
- This also matches the result given in the second equation.

Since the pattern of subtracting the second number from the first number works for both given examples, we can be confident this is the correct **system**.

Solving Unsolved Equation

Now we apply the identified pattern (First Number - Second Number) to the unsolved equation: $24 \times 13 = ?$

- First Number = 24
- Second Number = 13
- Applying the pattern:

$$24 - 13$$

- Calculation:

$$24 - 13 = 11$$

Therefore, based on the established **system**, the solution to the equation 24×13 is 11.

Final Answer Determination

The calculated answer is 11. Comparing this with the given options:

1. 10
2. 11
3. 12
4. 14

The correct option is 2, which corresponds to the value 11.

17. Answer: c

Explanation:

Identifying the Odd Word from the Given Alternatives

This question requires us to identify the word that does not belong with the others in the provided list. We need to analyze the meaning and category of each word to find the one that is different from the rest.

Analyzing the Measurement Units

Let's look at each alternative and understand what it represents:

- **Ton:** This is a unit used primarily for measuring **mass** or weight. It's a large unit, often used for heavy items.
- **Gallon:** This is a unit used for measuring **volume**, typically of liquids. It is commonly used in countries like the United States.
- **Litre:** This is also a unit used for measuring **volume**, especially for liquids. It is a metric unit widely used around the world.
- **Width:** This term refers to the measurement of extent of something from side to side. It is a unit of **length** or spatial dimension, not mass or volume.

Comparing the Categories

The key difference lies in what dimension each term measures:

- 'Ton' measures **mass**.
- 'Gallon' measures **volume**.
- 'Litre' measures **volume**.
- 'Width' measures **length** or distance.

While 'Ton', 'Gallon', and 'Litre' are all specific units of measurement for quantity (mass or volume), 'Width' represents a dimension or a type of measurement (length) itself, rather than a specific quantity unit comparable to the others in the same direct sense.

Summary Table of Units

Word	Type of Measurement	Category
Ton	Mass/Weight	Unit
Gallon	Volume	Unit
Litre	Volume	Unit
Width	Length/Distance	Dimension/Measure Type

Conclusion: Finding the Odd Word

Based on the analysis, 'Ton', 'Gallon', and 'Litre' are all specific units used to quantify mass or volume. 'Width', on the other hand, describes a linear dimension or spatial extent. Therefore, 'Width' is the **odd word** among the given **alternatives** because it represents a different kind of measurement (length) compared to the others (mass and volume).

18. Answer: a

Explanation:

The objective is to identify the pair of words from the given options where the relationship between the words is different from the relationship in the other pairs. This is a common type of verbal reasoning question that tests the ability to recognize patterns and analogies.

Relationship Analysis: Odd Word Identification

Let's analyze the relationship between the words in each given pair:

- Option 1: School – Principal

A Principal is the person in charge of leading and managing a **School**. This represents a relationship between a **Leader** and an **Institution**.

- **Option 2: Singer – Chorus**

A Chorus is a group of **Singers** performing together. The relationship is between an individual (Singer) and the **Group** (Chorus) they are part of.

- **Option 3: Artist – Troupe**

A Troupe is a group of performers, like actors or dancers. An **Artist** is an individual performer who can be a member of a Troupe. This signifies a relationship between an individual **Member** and their associated **Group**.

- **Option 4: Soldier – Battalion**

A Battalion is a specific type of military unit, composed of many **Soldiers**. The relationship here is between an individual **Member** (Soldier) and the military **Group** (Battalion) they belong to.

Identifying the Odd Pair: School and Principal

By examining the connections in each option:

- Options 2, 3, and 4 all demonstrate a pattern where the first word represents an individual person or role, and the second word represents a collective group or unit that the individual is typically a part of.
- In contrast, Option 1 shows a **School**, which is an organization or institution, and a **Principal**, who is its head or leader. The relationship is one of leadership or administration, not group membership in the same sense as the other options. A principal leads the school community but isn't typically considered a 'member' of the school in the way a singer is a member of a chorus.

Therefore, the pair "School – Principal" is the odd one out because its relationship type (Leader-Institution) differs from the Member-Group relationship seen in the other pairs.

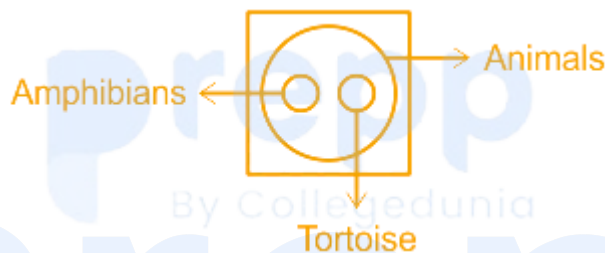
19. Answer: c

Explanation:

Tortoise is a reptile but an **animal** too.

Amphibians are **animals** that live on land as well as water.

This relationship is best represented by the following Venn diagram:



Hence, the correct answer is "option (3)".

20. Answer: b

Explanation:

Understanding the Word Analogy: Virology and Semantics

This question presents a relationship between two words and asks you to identify a similar relationship for a third word. The core task is to figure out how **Virology** relates to **Virus** and then apply that same logic to **Semantics**.

Relationship in the First Pair: Virology : Virus

Let's break down the first pair:

- **Virology** is the scientific study of viruses.

- A **virus** is the subject that virology specifically studies.

The pattern here is: '[Field of Study]' is the study of '[Subject Studied]'.

Identifying the Subject of Semantics

Now we apply this pattern to **Semantics**. We need to identify what field or subject Semantics studies.

Semantics is a specialized area within linguistics and philosophy that focuses on **meaning**. It deals with the interpretation and understanding of words, sentences, and symbols.

Evaluating the Options

Let's look at the provided options and see which one fits the definition of what Semantics studies:

Option	Explanation	Connection to Semantics
1. Books	Books are physical objects or collections of writing.	While books contain meaning, Semantics is the study of meaning itself, not the books that contain it.
2. Meanings	Meaning refers to the significance or interpretation of words, symbols, or actions.	This is the core subject of study in Semantics. The relationship perfectly matches the pattern (Virology studies Viruses, Semantics studies Meanings).
3. Music	Music is an art form involving sound and rhythm.	Semantics is unrelated to the study of music.
4. Culture	Culture encompasses the customs, arts, social institutions, and achievements of a particular nation or group.	Meaning is a component of culture, but Semantics focuses specifically on meaning, making 'Meanings' a more direct and accurate match.

The table shows that 'Meanings' is the term that Semantics directly studies.

Conclusion: The Related Word

Following the established analogy pattern (Field of Study : Subject Studied), Semantics is the study of **Meanings**. Therefore, the related word for Semantics is 'Meanings'.

21. Answer: b

Explanation:

Identifying the Odd Word Among Graphite, Pearl, Coal, and Diamond

The task is to find the word that does not belong with the others from the list: Graphite, Pearl, Coal, and Diamond. This requires understanding the nature and composition of each item.

Analyzing the Options

Let's examine each option to understand its characteristics:

- **Graphite:** Graphite is an allotrope of carbon. It's a crystalline form of the element carbon where the carbon atoms are arranged in a hexagonal lattice structure. It is a mineral and a key component used in pencils and various industrial applications.
- **Pearl:** A pearl is an organic gemstone. It is produced inside the soft tissue (specifically the mantle) of a living shelled mollusk or another animal, such as a conulariid cnidarian. Pearls are primarily composed of calcium carbonate (in the form of aragonite or calcite) and an organic binder called conchiolin.

- **Coal:** Coal is a combustible sedimentary rock composed mostly of carbon, along with variable quantities of other elements, chiefly hydrogen, sulfur, oxygen, and nitrogen. It is classified as a fossil fuel, formed from ancient plant matter over millions of years.
- **Diamond:** Diamond is another allotrope of carbon, known for its extreme hardness and high refractive index. Like graphite, it is a solid material whose atoms are arranged in a crystal structure called diamond cubic. It is a mineral and a precious gemstone.

Determining the Commonality and the Odd One Out

To find the odd word, we look for a common characteristic shared by most of the options:

- **Carbon Connection:** Both **Graphite** and **Diamond** are pure allotropes of carbon, meaning they are different structural forms of the same element.
- **Coal's Composition:** **Coal** is primarily composed of carbon, although it also contains other elements and impurities. It is fundamentally a carbon-rich fossil fuel.
- **Pearl's Distinction:** **Pearl** stands out because it is an *organic gem*, primarily made of calcium carbonate, not an allotrope or a carbon-rich mineral/fuel in the same sense as the others. Its formation is biological.

Conclusion

Based on the analysis, **Graphite**, **Coal**, and **Diamond** are all closely related to the element carbon. Graphite and Diamond are direct allotropes of carbon, while Coal is a carbon-rich fossil fuel. **Pearl**, being an organic gemstone composed mainly of calcium carbonate, is the outlier in this group.

22. Answer: d

Explanation:

After arranging each option, we obtain the following:

TRESSI → SISTER

THERMO → MOTHER

UGAHDETR → DAUGHTER

TOERMN → MENTOR

Thus, the first three options are blood relations but the fourth option **MENTOR** is different from the rest.

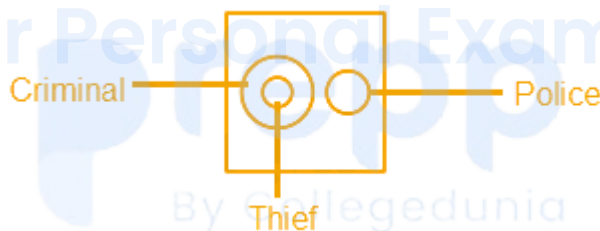
Therefore, the correct answer is "TOERMN".

23. Answer: a

Explanation:

Thieves are classified as criminals but the police are not included in it.

This relationship is best represented by the following Venn diagram:



Hence, the correct answer is "option (1)".

24. Answer: b

Explanation:

When the question figure is merged with the figure in Option (2), the complete pattern can be seen.



Hence, the correct answer is **Option "(2)"**.

25. Answer: b

Explanation:

Finding the Odd Word Pair Explained

This question asks us to identify which pair of words is different from the others based on the relationship between the two words in each pair. We need to look at how **Sulphur** relates to **Vulcanization**, **Iron** to **Carbon**, **Oxygen** to **Atmosphere**, and **Chlorine** to **Bleaching powder**.

Analyzing Word Pair Connections

Let's examine the connection in each given option:

- **Sulphur – Vulcanization:** **Sulphur** is an element essential for the process called **Vulcanization**. This process is used to harden rubber, making it more durable. The relationship here is Element -- Process It Enables.
- **Iron – Carbon:** **Iron** is a metal, and **Carbon** is a non-metal. When mixed together in specific proportions, they form an alloy called steel. This represents a relationship of elements forming an alloy.
- **Oxygen – Atmosphere:** **Oxygen** is a gas that makes up a significant part of the Earth's **Atmosphere**. This shows a Component -- Mixture relationship, where oxygen is a constituent of the atmosphere.

- **Chlorine – Bleaching powder:** Chlorine is a chemical element that is a key ingredient in the manufacturing of **Bleaching powder**. This is an Ingredient -- Product relationship.

Identifying the Odd Pair: Iron–Carbon Relationship

When we compare the relationships:

- Sulphur is used **in** the process of Vulcanization.
- Oxygen **is a component of** the Atmosphere.
- Chlorine is used **to create** Bleaching powder.
- Iron and Carbon combine **to form** the alloy Steel.

The relationship between **Iron** and **Carbon** is about creating an alloy (steel). This is different from the other pairs. Sulphur acts as a crucial agent in a process (vulcanization). Oxygen is a natural component of a mixture (atmosphere). Chlorine is a primary ingredient for a product (bleaching powder). The combination of iron and carbon is about forming a new material (steel) through alloying, which makes this pair the outlier.

Conclusion: The Distinct Iron–Carbon Pair

Therefore, the pair that stands out from the rest due to its distinct relationship type (alloy formation) compared to the element–process, component–mixture, and ingredient–product relationships in the other options is **Iron – Carbon**.

26. Answer: b

Explanation:

We have to check all the figures.

Figure A:



Here, the small line segment lies one space ahead of the dot, in a clockwise direction.

Figure B:



In all the given images except figure B, in each one of the other figures, the small line segment lies one space ahead of the dot, in a clockwise direction.

Figure C:



Here, the small line segment lies one space ahead of the dot, in a clockwise direction

Figure D:



Here, the small line segment lies one space ahead of the dot, in a clockwise direction

So, **Figure B** is the odd one out.

Hence, the correct answer is "option (2)".

27. Answer: a

Explanation:

When the question figure is merged with the figure in Option (1), the complete pattern can be seen.



Hence, the correct answer is "option (1)".

28. Answer: b

Explanation:

In the given question figure, one of the dots lies in the region common to the star circle and square, the second dot lies in the region common to square and circle only and the third dot lies in the region common to the circle only.

(A):



The second dot lies in the region common to square and circle only and the third dot lies in the region common to the circle only.

(B):



One of the dots lies in the region common to the star circle and square, the second dot lies in the region common to square and circle only.

(C):



Only This figure consists all types of regions.

(D):



One of the dots lies in the region common to the star, circle and square and the second dot lies in the region common to square and circle only.

As only figure (C) consist same type of the region.

Hence, **Figure 'C'** is the correct option.

29. Answer: d

Explanation:

In figure (X), one dot lies in the region common to all circle, triangle and square, the other dot lies in the region common to triangle and square, and the third dot lies in

region common to circle and square.

(A):



Dot can lie only in the region common to triangle and square.

(B):



Dot lies in the region common to triangle and square, and the other dot lies in region common to circle and square

(C):



Dot can lie only in the region common to triangle and square.

(D):



Dot can lie all three common regions. So, Only figure (D) consists of all three types of region.



Hence, **Figure D** consist of same type of region.

30. Answer: d

Explanation:

On observing the given figure carefully, we get:

In the given question figure,

- 1) One of the dots lies in the region common to the circle and triangle.
- 2) Second dot lies in the region common to circle and hexagon.
- 3) The other dot lies in the region common to triangle and pentagon.

Figure a: All the required conditions are fullfield as shown below:

Dot lies in the region common to circle and hexagon



Dots lies in the region common to the circle and triangle

Dot lies in the region common to triangle and pentagon.

Figure b: One of the dots lies in the region common to the circle and triangle, second dot doesn't lie in the region common to circle and hexagon and the other dot doesn't lie in the region common to triangle and pentagon.

Figure c: One of the dots lies in the region common to the circle and triangle, second dot doesn't lie in the region common to circle and hexagon and the other dot doesn't lie in the region common to triangle and pentagon.

Figure d: All the required conditions are fulfilled as shown below:

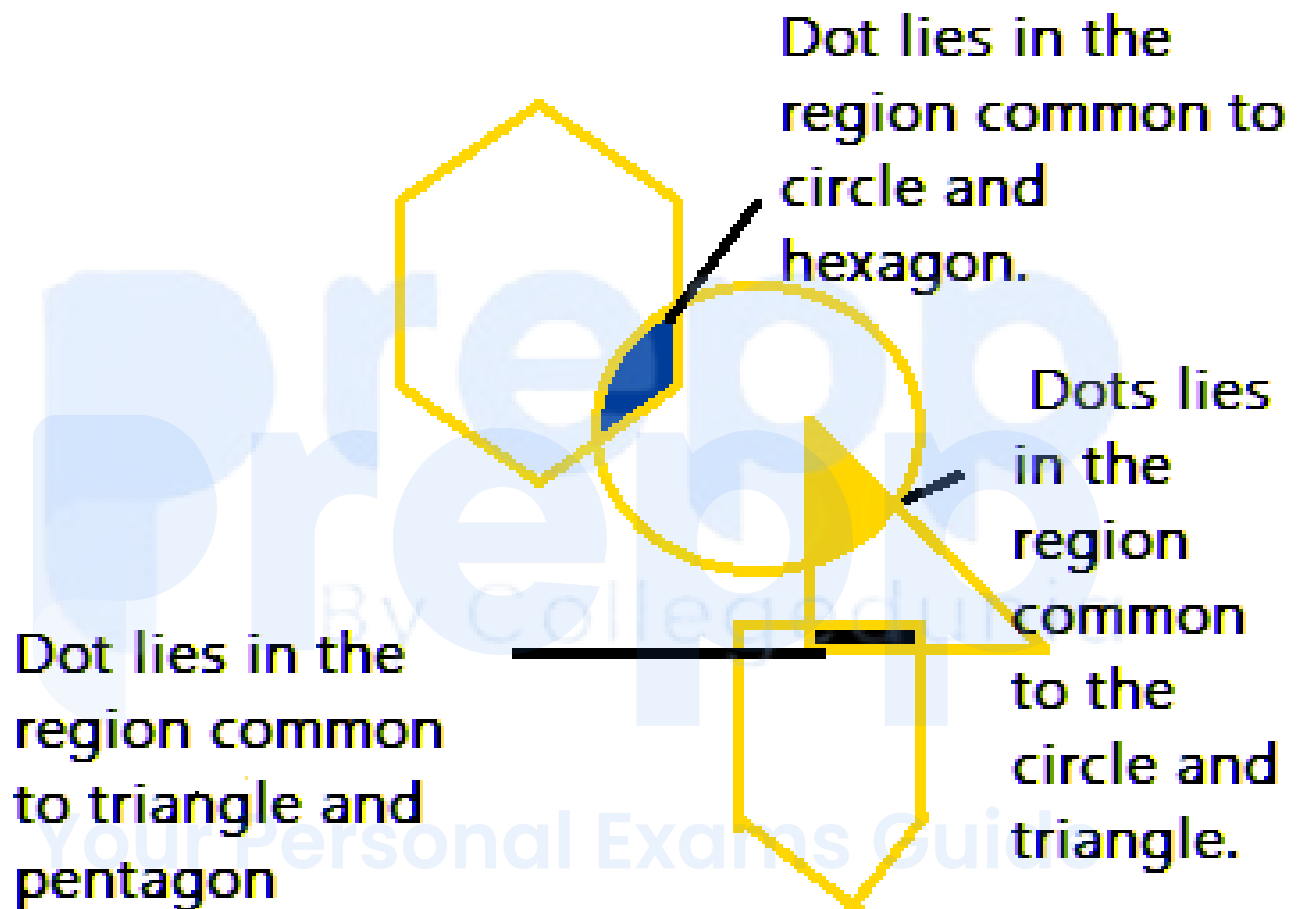


Figure (a) and (d) consist of same type of region.

Hence, the correct answer is "Figure (a) and (d)"

31. Answer: b

Explanation:

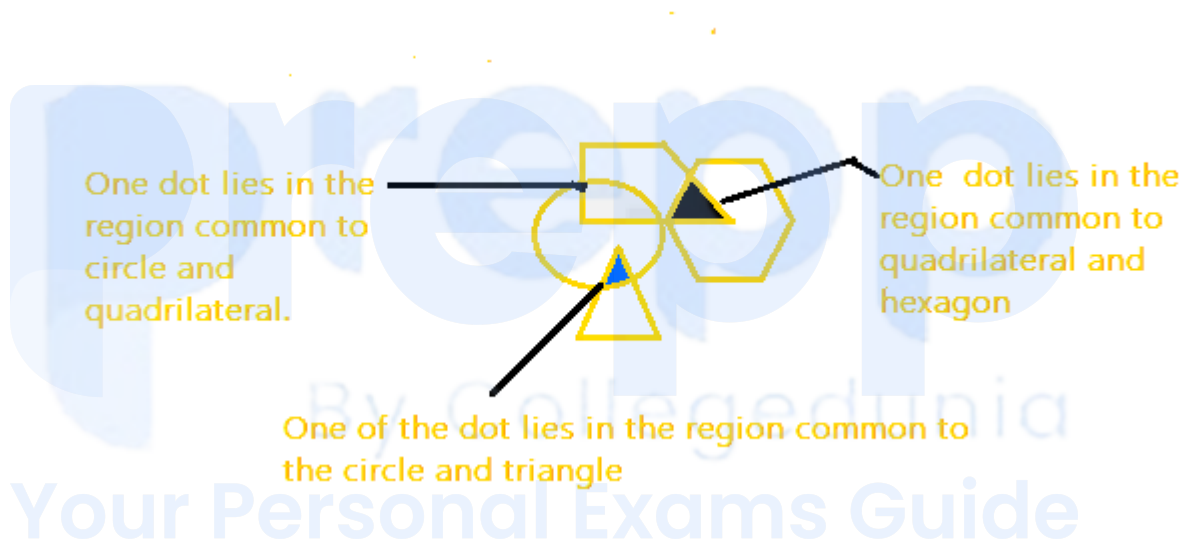
On observing the given figures carefully, we get:

In the given question figure,

- 1) One of the dot lies in the region common to the circle and triangle.
- 2) Second dot lies in the region common to circle and quadrilateral.
- 3) The other dot lies in the region common to quadrilateral and hexagon.

In **Figure (a)** One of the dot lies in the region common to the circle and triangle, second dot lies in the region common to circle and quadrilateral and the other dot doesn't lies in the region common to quadrilateral and hexagon.

In **Figure (b)** is fulfilling all required conditions.



In **Figure (c)** One of the dot doesn't lies in the region common to the circle and triangle, s econd dot lies in the region common to circle and quadrilateral and the other dot doesn't lies in the region common to quadrilateral and hexagon.

In **Figure (d)** One of the dot doesn't lies in the region common to the circle and triangle, second dot lies in the region common to circle and quadrilateral and the other dot doesn't lies in the region common to quadrilateral and hexagon.

Hence, the correct answer is "**Figure (b)**".

32. Answer: b

Explanation:

On observing the given figure carefully, we get:

In the question figure (X),

1. One dot is in the common area of the square, semi capsule and parallelogram.
2. One dot is in the common area of the only triangle and parallelogram.

Figure (a) → Common area of the only triangle and parallelogram and square, semi capsule and parallelogram isn't present.

Figure (b) → All the required conditions are fulfilled as shown below:



Figure (c) → Common area of the square, semi capsule and parallelogram isn't present.

Figure (d) → Common area of the only triangle and parallelogram and square, semi capsule and parallelogram isn't present.

Hence, the correct answer is "Figure (b)".

★ Important Points

We should not think of the exact shape and size of the figures in these questions.

Just resemblance will work like if an Equilateral triangle is given in the question figure, any shape of the triangle in the answer figure will work, be it right triangle or scalene triangle.

33. Answer: c

Explanation:

Understanding the Work Completion Scenario

This question requires us to calculate the total duration needed to finish a job. We need to consider the initial progress, a work stoppage period (lockdown), a loss of completed work due to an unforeseen event (flood), and a change in the number of workers. The goal is to find the **total time taken** to complete the **whole work**.

Initial Work Assessment

Let's break down the initial situation:

- Initial workforce: **200 men**
- Amount of work completed: $\frac{5}{6}$ of the total work
- Time spent on initial work: 10 weeks

We can use the concept that $\text{Work} = \text{Rate} \times \text{Number of Workers} \times \text{Time}$. Let the rate of one man be R units of work per week.

Assuming the total work is 1 unit, the work done is $\frac{5}{6}$ units.

So, we have the equation:

$$\frac{5}{6} (\text{Work}) = R (\text{Rate}) \times 200 (\text{Men}) \times 10 (\text{Weeks})$$

Calculating the Work Rate (R)

From the initial assessment, we can determine the work rate R :

$$R = \frac{5/6}{200 \times 10}$$

$$R = \frac{5}{6 \times 2000}$$

$$R = \frac{5}{12000}$$

$$R = \frac{1}{2400} \text{ units per man per week}$$

This rate signifies how much work a single man accomplishes in a week.

Accounting for Lockdown and Flood Impact

After the initial 10 weeks, several events impacted the project timeline and progress:

- **COVID Lockdown:** The work was halted for **6 weeks**. During this period, no work was done.
- **Flood Impact:** Half of the work that had already been completed (the $\frac{5}{6}$) was unfortunately **wasted**.
 - Work Wasted = $\frac{1}{2} \times \frac{5}{6} = \frac{5}{12}$ units
- **Effective Work Done Post-Flood:** The actual progress remaining after the flood is calculated as:
 - Effective Work = Initial Work Done - Work Wasted
 - Effective Work = $\frac{5}{6} - \frac{5}{12} = \frac{10}{12} - \frac{5}{12} = \frac{5}{12}$ units

Determining the Remaining Work

The total job requires completing 1 unit of work. After the flood, only $\frac{5}{12}$ units of work effectively remain from the initial progress. Therefore, the amount of work that still needs to be done to complete the whole project is:

$$\text{Work Left} = \text{Total Work} - \text{Effective Work Done}$$

$$\text{Work Left} = 1 - \frac{5}{12}$$

$$\text{Work Left} = \frac{12}{12} - \frac{5}{12} = \frac{7}{12} \text{ units}$$

Calculating Time with the New Workforce

The situation changed after the lockdown:

- New workforce size: **140 men**
- The combined work rate of these 140 men is: $140 \times R = 140 \times \frac{1}{2400} = \frac{140}{2400} = \frac{14}{240} = \frac{7}{120}$ units per week.

Now, we calculate the time required for these 140 men to finish the remaining $\frac{7}{12}$ units of work:

$$\text{Time Needed} = \frac{\text{Work Left}}{\text{Rate of 140 men per week}}$$

$$\text{Time Needed} = \frac{7/12}{7/120}$$

$$\text{Time Needed} = \frac{7}{12} \times \frac{120}{7}$$

$$\text{Time Needed} = \frac{120}{12} = 10 \text{ weeks}$$

It will take 10 weeks for the 140 men to complete the remaining part of the work.

Calculating the Total Time Taken

To find the total time taken for the entire project, we sum up all the periods:

1. Initial work phase: 10 weeks
2. Work stoppage due to lockdown: 6 weeks
3. Final work phase with the reduced workforce: 10 weeks

Total Time Taken = (Initial Work Time) + (Lockdown Time) + (Final Work Time)

Total Time Taken = 10 weeks + 6 weeks + 10 weeks = **26 weeks.**

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34. Answer: d

Explanation:

Calculating Time Taken by Men Based on Boys' Work

This problem involves calculating the total amount of work done and then determining how long it would take a different group of workers (men) with a different efficiency to complete the same work.

Understanding the Work Done by Boys

The problem describes a scenario where the number of boys working increases each day for 20 days:

- Day 1: 1 boy works
- Day 2: 2 boys work
- Day 3: 3 boys work
- ...
- Day 20: 20 boys work

To find the total work done, we sum the number of boys working each day. This is often measured in "boy-days", representing the total effort equivalent to one boy working for that many days.

Calculating the Total Work

The total work is the sum of the number of boys working each day from Day 1 to Day 20.

Total Work = $1 + 2 + 3 + \dots + 20$ boy-days.

This is an arithmetic progression. We can use the formula for the sum of the first ' n ' natural numbers:

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

In this case, $n = 20$.

$$\text{Total Work} = \frac{20 \times (20+1)}{2}$$

$$\text{Total Work} = \frac{20 \times 21}{2}$$

$$\text{Total Work} = 10 \times 21 = 210 \text{ boy-days.}$$

So, the total amount of work required is equivalent to 210 boy-days.

Relating Men's Efficiency to Boys' Efficiency

The problem states that one man is twice as efficient as one boy.

This means: Efficiency of 1 man = $2 \times$ Efficiency of 1 boy.

Alternatively, we can say that 1 man can do the work that 2 boys can do in the same amount of time.

Determining the Equivalent Work Capacity of Men

We need to find out how long it takes for 5 men to do the work.

First, let's find the combined work capacity of these 5 men in terms of "boy equivalents".

Since 1 man = 2 boys (in terms of work capacity),

5 men = 5×2 boys = 10 boys.

This means the group of 5 men works at a rate equivalent to 10 boys working together.

Calculating the Time Taken by 5 Men

Now we need to find the time it takes for this equivalent of 10 boys to complete the total work of 210 boy-days.

Time Taken = $\frac{\text{Total Work}}{\text{Work Rate of the Group}}$

The total work is 210 boy-days.

The work rate of the group of 5 men is equivalent to 10 boys.

Time Taken = $\frac{210 \text{ boy-days}}{10 \text{ boys}}$

Time Taken = 21 days.

Conclusion

Therefore, the time taken by 5 men, each twice as efficient as a boy, to complete the same work is 21 days.

35. Answer: a

Explanation:

Rates: $A = \frac{1}{9}$, $B = \frac{1}{12}$, $C = \frac{1}{36}$.

Step 1 — Combined A+B+C rate:

$$\frac{4 + 3 + 1}{36} = \frac{8}{36} = \frac{2}{9} \text{ per day}$$

Step 2 — Work done in 3 days: $3 \times \frac{2}{9} = \frac{2}{3}$; remaining = $\frac{1}{3}$.

Step 3 — B+C rate: $\frac{3+1}{36} = \frac{1}{9}$. Time to finish remaining $\frac{1}{3}$ at $\frac{1}{9}$ per day = 3 days.

36. Answer: d

Explanation:

Calculating Principal Sum from SI vs CI Difference Over 3 Years

This explanation details how to find the principal sum when given the difference between Simple Interest (SI) and Compound Interest (CI) over a period of 3 years at a specific rate of interest.

Understanding Simple Interest and Compound Interest Concepts

Simple Interest (SI) is the interest calculated solely on the initial principal amount borrowed or invested. The interest amount remains constant for each period.

Compound Interest (CI) is calculated on the principal amount as well as on the accumulated interest from previous periods. This 'interest on interest' effect causes the amount to grow at a faster rate compared to SI.

The **difference between SI and CI** increases over time because of the compounding effect.

Key Formula for 3 Years Difference

For a principal amount denoted by P , an annual **rate of interest** R (in percent), and a time period of 3 years, the formula connecting the **difference between CI and SI** is:

$$\text{Difference} = P \left(\frac{R}{100} \right)^2 \left(3 + \frac{R}{100} \right)$$

This formula is derived by calculating CI and SI separately for 3 years and finding their difference.

Applying the Formula to Solve the Problem

We are provided with the following information:

- Rate of Interest, $R = 2\%$ per annum
- Time Period, $T = 3$ years
- Difference between CI and SI = Rs. 604

Our objective is to determine the principal **sum** (P).

Step-by-Step Calculation to Find the Sum

1. Inputting Values into the Formula:

Substitute the given values into the difference formula:

$$604 = P \left(\frac{2}{100} \right)^2 \left(3 + \frac{2}{100} \right)$$

2. Simplifying the Rate Term:

Convert the percentage rate to a fraction:

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

3. Calculating the Components of the Formula:

Calculate $(R/100)^2$:

$$\left(\frac{1}{50}\right)^2 = \frac{1}{2500}$$

Calculate $(3 + R/100)$:

$$3 + \frac{1}{50} = \frac{150}{50} + \frac{1}{50} = \frac{151}{50}$$

4. Substituting Simplified Components Back:

Place the calculated values back into the main equation:

$$604 = P \left(\frac{1}{2500}\right) \left(\frac{151}{50}\right)$$

5. Combining Fractions:

Multiply the fractions together:

$$604 = P \left(\frac{1 \times 151}{2500 \times 50}\right)$$

$$604 = P \left(\frac{151}{125000}\right)$$

6. Solving for the Principal Sum (P):

Rearrange the equation to solve for P:

$$P = \frac{604 \times 125000}{151}$$

7. Final Calculation:

Perform the division and multiplication:

$$P = 4 \times 125000$$

$$P = 500000$$

Result Summary

The calculation shows that the principal **sum** required for the **difference between SI and CI** to be Rs. 604 over **3 years** at a **rate of interest** of 2% p.a. is Rs. 5,00,000.

37. Answer: a

Explanation:

Calculating Compound Interest Quarterly

This explanation details the calculation of compound interest when the interest is compounded quarterly. We will break down the problem step-by-step to find the total compound interest earned on the deposited amount.

Understanding the Compound Interest Formula

The formula for the amount (A) when interest is compounded is:

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

Where:

- P = Principal amount (the initial amount of money)
- r = Annual interest rate (in decimal form)
- n = Number of times that interest is compounded per year
- t = Time the money is invested or borrowed for, in years

The Compound Interest (CI) is calculated as the difference between the final amount and the principal:

$$CI = A - P$$

Applying the Formula to the Problem

Let's identify the given values:

- Principal (P) = Rs. 64,000

- Annual Interest Rate = 10%
- Time (t) = 1 year
- Compounding Frequency = Quarterly

Since the interest is compounded quarterly, the number of times interest is compounded per year is $n = 4$.

Calculating the Interest Rate per Period

The annual interest rate (r) needs to be converted to decimal form:

$$r = \frac{10\%}{100} = 0.10$$

The interest rate per compounding period (quarterly) is:

$$\frac{r}{n} = \frac{0.10}{4} = 0.025$$

Calculating the Total Number of Compounding Periods

The total number of compounding periods is:

$$nt = 4 \times 1 = 4$$

Calculating the Final Amount

Now, we can calculate the total amount (A) after 1 year using the formula:

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

$$A = 64000 (1 + 0.025)^4$$

$$A = 64000(1.025)^4$$

Let's calculate $(1.025)^4$:

$$(1.025)^4 \approx 1.10381289$$

Now, multiply this by the principal:

$$A = 64000 \times 1.10381289$$

$$A \approx 70644.025$$

Calculating the Total Compound Interest

Finally, calculate the compound interest (CI) by subtracting the principal from the final amount:

$$CI = A - P$$

$$CI = 70644.025 - 64000$$

$$CI = 6644.025$$

Rounding to the nearest Rupee, the total compound interest is Rs. 6,644.

Conclusion

The total compound interest earned after one year, with the interest compounded quarterly, is approximately Rs. 6,644.

38. Answer: a

Explanation:

This solution explains how to find the value of the unknown '?' in the given mathematical expression: $(30\% \text{ of } 6500) \div 26 \div 15 = ?$. We will break down the calculation step-by-step.

Finding the Value of the Expression

The problem requires us to perform a sequence of operations: first, calculate a percentage of a number, and then perform two divisions. We need to determine the final result of this calculation.

Step-by-Step Calculation Breakdown

We will solve the expression following the standard order of operations. First, we address the part inside the parentheses, which involves calculating the percentage.

Calculating the Percentage Value

The first step is to find **30% of 6500**. To do this, we convert the percentage into a fraction or a decimal and multiply it by the number 6500.

- The percentage is 30%. As a fraction, this is $\frac{30}{100}$.
- The number we are taking the percentage of is 6500.
- The calculation is performed as follows: $\text{30\% of 6500} = \frac{30}{100} \times 6500$
- To simplify the calculation, we can cancel out the zeros:

$$= \frac{30}{100} \times 6500 = 30 \times \frac{6500}{100}$$

$$= 30 \times 65$$

- Performing the multiplication:

$$30 \times 65 = 1950$$

So, 30% of 6500 equals 1950.

Performing the First Division

The next operation is to divide the result obtained (1950) by 26.

- We need to calculate: $1950 \div 26$.
- This can be written as a fraction:

$$\frac{1950}{26}$$

- We can simplify this fraction by dividing both the numerator and the denominator by a common factor. Both numbers are even, so let's divide by 2:

$$\frac{1950 \div 2}{26 \div 2} = \frac{975}{13}$$

- Now, we perform the division $975 \div 13$. We find that:

$$975 \div 13 = 75$$

The result after the first division is 75.

Performing the Second Division

The final step is to divide the result from the previous calculation (75) by 15.

- We need to calculate: $75 \div 15$.
- This can be written as:

$$\frac{75}{15}$$

- Performing the division:

$$\frac{75}{15} = 5$$

Therefore, the final value of the expression is 5.

Final Result Verification

Let's summarize the steps to verify the answer:

1. Calculate 30% of 6500: $\frac{30}{100} \times 6500 = 1950$.
2. Divide the result by 26: $1950 \div 26 = 75$.
3. Divide the new result by 15: $75 \div 15 = 5$.

The calculation confirms that the value of '?' is 5.

39. Answer: d

Explanation:

Solving the Algebraic Equation for x

The question asks us to find the value of the variable x based on the equation provided. We need to carefully follow the order of operations (PEMDAS/BODMAS) to solve this problem accurately.

Interpreting the Mathematical Expression

The equation given is:

$$1089 = \frac{(33 \times x \times 33) - 1.6}{33 \times 1.4}$$

This interpretation assumes the structure involves a numerator $(33 \times x \times 33 - 1.6)$ being divided by the product of 33 and 1.4.

Step-by-Step Calculation

1. **Calculate the Denominator:** First, let's calculate the value of the denominator part of the fraction:

$$33 \times 1.4$$

To multiply 33 by 1.4:

$$33 \times 1.4 = 46.2$$

2. **Simplify the Numerator Expression:** Next, we simplify the multiplication involving the variable x in the numerator:

$$33 \times x \times 33$$

Since $33 \times 33 = 1089$, this part becomes:

$$1089x$$

So, the complete numerator is $1089x - 1.6$.

3. **Rewrite the Equation:** Now, we substitute the simplified denominator and numerator back into the equation:

$$1089 = \frac{1089x - 1.6}{46.2}$$

4. **Isolate the Numerator:** To isolate the expression containing x , we multiply both sides of the equation by the denominator (46.2):

$$1089 \times 46.2 = 1089x - 1.6$$

Performing the multiplication:

$$50311.8 = 1089x - 1.6$$

5. **Isolate the Term with x :** To get the term $1089x$ by itself, we add 1.6 to both sides of the equation:

$$50311.8 + 1.6 = 1089x$$

$$50313.4 = 1089x$$

6. **Determine the Value of x :** Finally, we solve for x by dividing both sides by 1089:

$$x = \frac{50313.4}{1089}$$

Calculating the division:

$$x \approx 46.1996$$

Result Analysis

Based on the calculations following the standard interpretation of the equation, the value obtained for x is approximately 46.2. It is important to note that this calculated value does not correspond to any of the options provided (2, 4, 5, 6). This suggests there might be an error in the original question statement or the given options.

40. Answer: c

Explanation:

Understanding the Travel Distance and Fare

This problem involves a journey made using two modes of transport: a car and a taxi. We are given the total distance travelled, the cost per kilometre for each mode of transport, and the total amount spent on the fare. Our goal is to determine the specific distance covered using the taxi.

Let's break down the information provided:

- Total distance travelled = 90 km
- Fare for car = Rs. 7 per km
- Fare for taxi = Rs. 6 per km
- Total fare = Rs. 576

Setting Up Equations for Travel

To solve this, we need to represent the unknown distances with variables. Let:

- c be the distance covered by car (in km).
- t be the distance covered by taxi (in km).

Based on the problem statement, we can establish two main equations:

1. **Equation for Total Distance:** The sum of the distances travelled by car and taxi equals the total distance.

$$c + t = 90$$

2. **Equation for Total Fare:** The total fare is the sum of the fare for the car journey and the fare for the taxi journey.

$$(\text{Fare per km by car} \times c) + (\text{Fare per km by taxi} \times t) = \text{Total Fare}$$

Substituting the given values:

$$7c + 6t = 576$$

Calculating Taxi Distance Step-by-Step

Now, we need to solve this system of two linear equations with two variables (c and t). We can use the substitution method.

1. **Express c in terms of t :** From the first equation ($c + t = 90$), we can isolate c :

$$c = 90 - t$$

2. **Substitute into the Fare Equation:** Replace c in the second equation ($7c + 6t = 576$) with the expression ($90 - t$):

$$7(90 - t) + 6t = 576$$

3. **Simplify and Solve for t :** Distribute the 7:

$$(7 \times 90) - (7 \times t) + 6t = 576$$

$$630 - 7t + 6t = 576$$

Combine the t terms:

$$630 - t = 576$$

Now, isolate t by subtracting 576 from both sides and adding t to both sides:

$$630 - 576 = t$$

$$t = 54$$

So, the distance covered by taxi is 54 km.

Verifying the Total Fare Calculation

Let's check if this distance is consistent with the total fare given.

- Distance by taxi (t) = 54 km
- Distance by car (c) = $90 - t = 90 - 54 = 36$ km
- Fare for car = $7 \times c = 7 \times 36 = 252$
- Fare for taxi = $6 \times t = 6 \times 54 = 324$
- Total Fare = Fare for car + Fare for taxi = $252 + 324 = 576$

The calculated total fare (\$576) matches the total fare provided in the question, confirming our result.

Conclusion on Taxi Distance

The calculation confirms that the distance covered by taxi is 54 km.

41. Answer: b

Explanation:

Understanding the Bullet Firing Time Interval Problem

This problem explores the concept of relative motion, specifically how the movement of a bus approaching a stationary sound source (the firing point) affects the time interval at which successive sounds are heard. We are given the regular interval at which two bullets are fired and the slightly shorter interval at which the bus passengers hear the sounds. We also know the constant speed of sound in the air.

The key to solving this problem is understanding that the difference between the actual firing interval and the perceived hearing interval is due to the bus moving closer to the source between the arrival of the two sound waves. This movement reduces the distance the second sound wave has to travel, causing it to arrive earlier than it would if the bus were stationary.

Given Information for Sound and Bus Speed Calculation

- Time interval between firing bullets (Δt_{fire}): 15 minutes
- Time interval bus hears bullets (Δt_{bus_heard}): 14.5 minutes
- Speed of sound (V_{sound}): 330 meters per second (m/s)

Calculating Bus Speed Using the Time Saved Principle

If the bus were not moving, the time interval between hearing the two bullet sounds would be the same as the time interval between firing them, i.e., 15 minutes. Since the bus is moving towards the source, it effectively "meets" the sound of the second bullet earlier. The amount of time saved in hearing the second bullet is the difference between the actual firing interval and the perceived hearing interval:

$$\Delta t_{\text{saved}} = \Delta t_{\text{fire}} - \Delta t_{\text{bus_heard}}$$

$$\Delta t_{\text{saved}} = 15 \text{ minutes} - 14.5 \text{ minutes}$$

$$\Delta t_{\text{saved}} = 0.5 \text{ minutes}$$

Now, let's think about what happens during the 14.5 minutes between the bus hearing the first bullet and hearing the second bullet. During this time, the bus is moving towards the firing point. Let V_{bus} be the constant speed of the bus. The distance the bus travels towards the source in this interval is:

$$D_{\text{bus}} = V_{\text{bus}} \times \Delta t_{\text{bus_heard}}$$

$$D_{\text{bus}} = V_{\text{bus}} \times 14.5 \text{ minutes}$$

This distance D_{bus} that the bus covered towards the source in 14.5 minutes is exactly the additional distance the sound of the second bullet would have had to travel if the bus had remained at the position where it heard the first bullet. This extra travel time for sound corresponds to the time saved, Δt_{saved} . So, the distance sound travels in the saved time is:

$$D_{\text{sound}} = V_{\text{sound}} \times \Delta t_{\text{saved}}$$

$$D_{\text{sound}} = 330 \text{ m/s} \times 0.5 \text{ minutes}$$

By equating the distance the bus traveled towards the source to the distance sound travels in the saved time, we can find the speed of the bus:

$$D_{\text{bus}} = D_{\text{sound}}$$

$$V_{\text{bus}} \times \Delta t_{\text{bus_heard}} = V_{\text{sound}} \times \Delta t_{\text{saved}}$$

Substituting the values we have:

$$V_{\text{bus}} \times 14.5 \text{ minutes} = 330 \text{ m/s} \times 0.5 \text{ minutes}$$

We can solve for V_{bus} :

$$V_{\text{bus}} = \frac{330 \text{ m/s} \times 0.5 \text{ minutes}}{14.5 \text{ minutes}}$$

The time units (minutes) cancel out:

$$V_{bus} = \frac{330 \times 0.5}{14.5} \text{ m/s}$$

To work with whole numbers, multiply the numerator and denominator by 10:

$$V_{bus} = \frac{330 \times 5}{145} \text{ m/s}$$

Divide 145 by 5, which is 29:

$$V_{bus} = \frac{330 \times 5}{29 \times 5} \text{ m/s}$$

$$V_{bus} = \frac{330}{29} \text{ m/s}$$

The problem asks for the speed in kilometers per hour (km/hr). We need to convert the speed from m/s to km/hr. The conversion factor is 3.6 (since $1 \text{ m/s} = 18/5 \text{ km/hr} = 3.6 \text{ km/hr}$):

$$V_{bus}(\text{km/hr}) = V_{bus}(\text{m/s}) \times 3.6$$

$$V_{bus}(\text{km/hr}) = \frac{330}{29} \times 3.6$$

$$V_{bus}(\text{km/hr}) = \frac{330 \times 3.6}{29}$$

$$V_{bus}(\text{km/hr}) = \frac{1188}{29}$$

Now, let's perform the division:

$$\frac{1188}{29} \approx 40.9655 \text{ km/hr}$$

This value is very close to 41 km/hr.

Conclusion on Bus Speed Calculation

Based on the calculations, the speed of the bus is approximately 41 km/hr.

Let's compare this result with the given options:

Option	Speed
1	30 km/hr
2	41 km/hr
3	50 km/hr
4	70 km/hr

The calculated speed of approximately 41 km/hr matches Option 2.

Revision Table: Understanding Speed and Time Intervals

Concept	Relevance to the Problem
Time Interval of Source	The fixed time gap between successive events at the source (bullet firing). In this case, 15 minutes.
Time Interval of Observer	The time gap between the observer (bus) perceiving the successive events. This differs from the source interval if the observer is moving. Here, 14.5 minutes.
Time Saved	The reduction in the observer's interval compared to the source's interval. This happens when the observer moves towards the source. $(\Delta t_{fire} - \Delta t_{bus_heard})$.
Relative Speed	While not explicitly calculated as a relative speed value, the concept underpins the solution – the bus's movement relative to the sound wave causes the change in the perceived interval.

Additional Information: Doppler Effect Connection

This problem is related to the physical principles behind the Doppler effect, although it's a simpler application focusing on time intervals rather than frequency shift. The

Doppler effect describes how the frequency and wavelength of a wave change for an observer moving relative to the wave's source.

In this scenario, the changing perceived time interval between the sound pulses is a direct consequence of the bus's motion changing the distance the sound travels between successive pulses reaching the bus. The method used here, equating the distance covered by the bus during the hearing interval to the distance sound covers in the saved time, provides a straightforward way to solve for the bus's speed without needing the full Doppler equations for frequency.

It's a classic physics problem illustrating how movement affects observations of time-based events related to wave propagation. The constant speed of sound is a critical piece of information that allows us to translate the "time saved" into a distance, which is then used to find the speed of the moving object (the bus).

42. Answer: b

Explanation:

Calculating Distance Between Perpendicularly Moving Trains

This problem asks us to find the distance between two trains, Train A and Train B, after a specific time, given their speeds and the fact that they are moving in perpendicular directions from the same starting point.

Understanding the Scenario

- Train A's speed (v_A) = 1.5 km/hr
- Train B's speed (v_B) = 2 km/hr
- Time duration (t) = 2 hours
- Direction of movement: Perpendicular to each other
- Starting Point: Same for both trains

Calculating Distances Covered by Each Train

We first need to calculate how far each train has traveled in 2 hours using the formula: Distance = Speed $\times$ Time.

Distance Covered by Train A:

Using the formula $d = v \times t$, where d is distance, v is speed, and t is time.

Distance covered by Train A (d_A) = $v_A \times t$

$$d_A = 1.5 \text{ km/hr} \times 2 \text{ hr}$$

$$d_A = 3 \text{ km}$$

Distance Covered by Train B:

Similarly, for Train B:

Distance covered by Train B (d_B) = $v_B \times t$

$$d_B = 2 \text{ km/hr} \times 2 \text{ hr}$$

$$d_B = 4 \text{ km}$$

Applying the Pythagorean Theorem

Since the trains are moving in perpendicular directions, the path taken by Train A, the path taken by Train B, and the direct line connecting their final positions form a right-angled triangle. The distances d_A and d_B are the lengths of the two legs (perpendicular sides) of this triangle, and the distance between the trains is the hypotenuse.

We can use the Pythagorean theorem, which states that in a right-angled triangle, the square of the hypotenuse (c) is equal to the sum of the squares of the other two sides (a and b): $c^2 = a^2 + b^2$.

In our case:

- $a = d_A = 3 \text{ km}$
- $b = d_B = 4 \text{ km}$
- c = Distance between the trains

So, the distance between the trains (c) can be calculated as:

$$c^2 = d_A^2 + d_B^2$$

$$c^2 = (3 \text{ km})^2 + (4 \text{ km})^2$$

$$c^2 = 9 \text{ km}^2 + 16 \text{ km}^2$$

$$c^2 = 25 \text{ km}^2$$

To find the distance c , we take the square root of both sides:

$$c = \sqrt{25 \text{ km}^2}$$

$$c = 5 \text{ km}$$

Conclusion

After 2 hours, the distance between Train A and Train B is 5 km.

43. Answer: c

Explanation:

Calculating Combined Average Weight for Section X and Section Y Students

This solution explains how to find the combined average weight when given the average weights and counts for two different groups (sections). We will use the concept of weighted averages to solve this problem.

Understanding Weighted Average

When combining groups with different sizes and averages, the overall average is influenced more by the larger group. The formula for combined average is:

$$\text{Combined Average} = \frac{\text{Sum of values of Group 1} + \text{Sum of values of Group 2}}{\text{Number of items in Group 1} + \text{Number of items in Group 2}}$$

Alternatively, it can be calculated as:

$$\text{Combined Average} = \frac{(\text{Average}_1 \times \text{Count}_1) + (\text{Average}_2 \times \text{Count}_2)}{\text{Count}_1 + \text{Count}_2}$$

Here, Group 1 is Section X and Group 2 is Section Y.

Information Given:

- Section X: Average weight = 50, Number of students = 30
- Section Y: Average weight = 45, Number of students = 20

Step-by-Step Calculation:

1. Calculate the total weight of students in Section X:

Total Weight (X) = Average weight of X $\times$ Number of students in X

$$\text{Total Weight (X)} = 50 \times 30$$

$$\text{Total Weight (X)} = 1500$$

2. Calculate the total weight of students in Section Y:

Total Weight (Y) = Average weight of Y $\times$ Number of students in Y

$$\text{Total Weight (Y)} = 45 \times 20$$

$$\text{Total Weight (Y)} = 900$$

3. Calculate the total weight of all students combined:

Total Combined Weight = Total Weight (X) + Total Weight (Y)

Total Combined Weight = $1500 + 900$

Total Combined Weight = 2400

4. Calculate the total number of students:

Total Students = Number of students in X + Number of students in Y

Total Students = $30 + 20$

Total Students = 50

5. Calculate the combined average weight:

Combined Average Weight = $\frac{\text{Total Combined Weight}}{\text{Total Students}}$

Combined Average Weight = $\frac{2400}{50}$

Combined Average Weight = 48

Conclusion

The average weight of all students combined from Section X and Section Y is 48.

Answer Check:

The calculated average weight is 48, which matches one of the options provided.

44. Answer: d

Explanation:

Profit Percentage Calculation Explained

This solution details how to determine the profit percentage when the cost price (CP) of a specific quantity of items equals the selling price (SP) of another quantity. We will focus on the condition where the **cost price of 20 articles** is equivalent to the **selling price of 15 articles**.

Understanding the Relationship Between CP and SP

The problem states a direct relationship between the cost price of multiple articles and the selling price of a different number of articles. This relationship is the key to solving the problem.

Given Condition:

Cost Price of 20 Articles = Selling Price of 15 Articles

Step-by-Step Solution Breakdown

1. Assign Variables:

To make calculations easier, let's assign variables:

- Let C represent the Cost Price (CP) of a single article.
- Let S represent the Selling Price (SP) of a single article.

2. Formulate the Equation:

Using the variables defined above and the condition given in the question, we can write the equation:

$$20 \times C = 15 \times S$$

3. Calculate the Ratio of SP to CP:

To find the profit percentage, we need to know how the selling price (S) compares to the cost price (C). We rearrange the equation to find the ratio $\frac{S}{C}$:

$$\frac{S}{C} = \frac{20}{15}$$

Simplify the fraction by dividing both the numerator and the denominator by their greatest common divisor, which is 5:

$$\frac{S}{C} = \frac{4}{3}$$

This ratio ($\frac{4}{3}$) tells us that for every 3 units of cost price, the selling price is 4 units.

4. Calculate Profit:

Profit is calculated as the Selling Price minus the Cost Price (Profit = $S - C$).

From the ratio we found, we know $S = \frac{4}{3}C$. Now, substitute this into the profit formula:

$$\text{Profit} = \frac{4}{3}C - C$$

To subtract, find a common denominator:

$$\text{Profit} = \frac{4}{3}C - \frac{3}{3}C$$

$$\text{Profit} = \frac{4C - 3C}{3}$$

$$\text{Profit} = \frac{1}{3}C$$

This means the profit made is equal to one-third of the cost price.

5. Calculate Profit Percentage:

The formula for profit percentage is:

$$\text{Profit Percentage} = \left(\frac{\text{Profit}}{\text{CP}} \right) \times 100\%$$

Substitute the profit we calculated ($\frac{1}{3}C$) and the cost price (C):

$$\text{Profit Percentage} = \left(\frac{\frac{1}{3}C}{C} \right) \times 100\%$$

The variable C cancels out:

$$\text{Profit Percentage} = \frac{1}{3} \times 100\%$$

$$\text{Profit Percentage} = \frac{100}{3}\%$$

Converting this fraction to a decimal gives:

$$\text{Profit Percentage} \approx 33.33\%$$

Conclusion

Based on the calculations, the profit percentage made is $\frac{100}{3}\%$, which is approximately 33.33%.

45. Answer: c

Explanation:

Finding the Combined Average Age of Students from Two Classes

This question asks us to find the average age of students when considering two different groups, Class A and Class B, with different numbers of students and different average ages. To solve this, we need to combine the total age sum and the total number of students from both classes.

Understanding the Given Information

We are provided with the following details:

- For Class A: Number of students = 40, Average age = 16 years.
- For Class B: Number of students = 60, Average age = 20 years.

Calculating the Total Sum of Ages for Each Class

The average is calculated as the sum of values divided by the count of values. Therefore, the sum of values can be found by multiplying the average by the count.

Sum of Ages for Class A

To find the total sum of ages for students in Class A, we use the formula:

$$\text{Sum} = \text{Average Age} \times \text{Number of Students}$$

$$\text{Sum for Class A} = 16 \text{ years} \times 40 \text{ students}$$

$$\text{Sum for Class A} = 640 \text{ years}$$

Sum of Ages for Class B

Similarly, for Class B:

$$\text{Sum for Class B} = 20 \text{ years} \times 60 \text{ students}$$

$$\text{Sum for Class B} = 1200 \text{ years}$$

Calculating the Total Number of Students and Total Sum of Ages

Next, we need the total number of students across both classes and the total sum of their ages.

Total Number of Students

The total number of students is the sum of students from Class A and Class B:

$$\text{Total Students} = \text{Number of students in Class A} + \text{Number of students in Class B}$$

$$\text{Total Students} = 40 + 60 = 100 \text{ students}$$

Total Sum of Ages

The total sum of ages for all students is the sum of the ages from Class A and Class B:

$$\text{Total Sum of Ages} = \text{Sum for Class A} + \text{Sum for Class B}$$

$$\text{Total Sum of Ages} = 640 \text{ years} + 1200 \text{ years} = 1840 \text{ years}$$

Calculating the Combined Average Age

Now, we can find the average age of all students combined by dividing the total sum of ages by the total number of students.

$$\text{Combined Average Age} = \frac{\text{Total Sum of Ages}}{\text{Total Number of Students}}$$

$$\text{Combined Average Age} = \frac{1840 \text{ years}}{100 \text{ students}}$$

$$\text{Combined Average Age} = 18.4 \text{ years}$$

Final Answer

The average age of all the students in both classes combined is 18.4 years.

46. Answer: c

Explanation:

This problem involves calculating the initial total number of books in a library, given the percentages of books in different languages (English, Hindi, Sanskrit) removed sequentially, and the final count of the remaining books.

Understanding the Sequential Percentage Reductions

We need to determine the total number of books by working backward from the final remaining count. The percentages are applied to the *remaining* books at each step, not the original total.

Step-by-Step Calculation of Remaining Books

Let the total number of books in the library be represented by the variable T .

- **English Books:** 5% of the total books are in English. The number of English books is $0.05 \times T$.

- **Remaining Books after English:** The portion of books remaining after removing the English books is: $T - (0.05 \times T) = T \times (1 - 0.05) = 0.95 \times T$
- **Hindi Books:** 10% of the *remaining* books are in Hindi. The number of Hindi books is $0.10 \times (0.95 \times T)$.
- **Remaining Books after Hindi:** The portion of books remaining after removing the Hindi books is: $(0.95 \times T) - (0.10 \times 0.95 \times T) = (0.95 \times T) \times (1 - 0.10) = (0.95 \times T) \times 0.90$
- **Sanskrit Books:** 15% of the *new remaining* books are in Sanskrit. The number of Sanskrit books is $0.15 \times (0.95 \times T \times 0.90)$.
- **Remaining Books after Sanskrit:** The portion of books remaining after removing the Sanskrit books is: $(0.95 \times T \times 0.90) - (0.15 \times 0.95 \times T \times 0.90) = (0.95 \times T \times 0.90) \times (1 - 0.15)$ This simplifies to: $(0.95 \times T \times 0.90) \times 0.85$

Finding the Total Number of Books

We are given that the final number of remaining books (which are in French) is 11628.

Therefore, we can set up the equation:

$$T \times 0.95 \times 0.90 \times 0.85 = 11628$$

First, let's calculate the product of the remaining proportions:

$$0.95 \times 0.90 \times 0.85 = 0.855 \times 0.85 = 0.72675$$

Now, the equation becomes:

$$T \times 0.72675 = 11628$$

To find the total number of books (T), we divide the remaining count by the combined proportion:

$$T = \frac{11628}{0.72675}$$

Performing the division:

$$T = 16000$$

Conclusion

The calculation shows that the total number of books initially present in the French library was 16000.

Verification

Let's check the result:

Total Books	16000
English Books (5%)	$0.05 \times 16000 = 800$
Remaining after English	$16000 - 800 = 15200$
Hindi Books (10% of 15200)	$0.10 \times 15200 = 1520$
Remaining after Hindi	$15200 - 1520 = 13680$
Sanskrit Books (15% of 13680)	$0.15 \times 13680 = 2052$
Remaining French Books	$13680 - 2052 = 11628$

The final remaining number matches the number given in the question, confirming our calculation.

47. Answer: b

Explanation:

Understanding the Rice Selling Price and Cost Price Relationship

This question asks us to determine the value of 'x' kilograms, given that the **selling price** of 30 kg of rice equals the **cost price** of 'x' kg of rice, and the shopkeeper makes

a 20% profit.

Defining Variables and Relationships

Let's establish the terms we'll use:

- Let C represent the cost price of 1 kg of rice.
- Let S represent the selling price of 1 kg of rice.

The problem states a **profit of 20%**. This profit is calculated based on the cost price. The relationship between the selling price (S) and cost price (C) per kg is:

$$S = C + \text{Profit}$$

Where Profit = 20% of $C = 0.20 \times C$.

Substituting the profit value:

$$S = C + 0.20C$$

Factor out C :

$$S = C(1 + 0.20)$$

$$S = 1.20C$$

This equation tells us that the selling price per kg is 1.20 times the cost price per kg.

Setting Up the Equation Based on Quantities

The problem provides a key condition: *"The selling price of 30 kg of rice is same as the cost price of 'x' kg of rice."*

We can write this using our variables:

Total Selling Price of 30 kg = $30 \times S$

Total Cost Price of x kg = $x \times C$

Equating these based on the problem statement:

$$30 \times S = x \times C$$

Calculating the Value of 'x'

To find 'x', we can substitute the expression for S (which is $1.20C$) into the equation from the previous step:

$$30 \times (1.20C) = x \times C$$

Now, perform the multiplication on the left side:

$$36C = xC$$

Assuming the cost price per kg (C) is greater than zero, we can divide both sides of the equation by C :

$$\frac{36C}{C} = \frac{xC}{C}$$

This simplifies to:

$$36 = x$$

Final Answer Explanation

Therefore, the value of 'x' is 36. This result signifies that for the shopkeeper to make a 20% profit, the revenue obtained from selling 30 kg of rice is equivalent to the cost incurred for 36 kg of rice.

48. Answer: b

Explanation:

Determining Vertical Pole Length from Shadow

This problem asks us to find the height of a second vertical pole, given the height and shadow length of a first pole, and the shadow length of the second pole. This

type of problem often involves the concept of similar triangles, which arise when comparing objects under the same angle of illumination, like sunlight.

The Principle of Similar Triangles

Imagine the sun's rays hitting the top of each pole and extending to the tip of its shadow on the ground. Since the poles are vertical, they stand straight up, forming a 90-degree angle with the ground. Assuming the sun is at the same angle relative to the ground for both poles:

- The angle between the pole and the ground is 90 degrees for both triangles.
- The angle of elevation of the sun (the angle between the ground and the sun's ray hitting the top of the pole) is the same for both poles.

Because two angles are the same in both triangles (the 90-degree angle and the sun's angle of elevation), the third angle must also be the same. This means the two triangles formed by each pole, its shadow, and the sun's ray are **similar triangles**.

For similar triangles, the ratio of their corresponding sides is equal. In this case, the ratio of the pole's height to its shadow's length will be the same for both poles.

Setting Up the Proportion

Let's define the variables:

- h_1 = Height of the first pole
- s_1 = Shadow length of the first pole
- h_2 = Height of the second pole
- s_2 = Shadow length of the second pole

We are given:

- $s_1 = 12$ m
- $s_2 = 14$ m
- $h_1 = 48$ m

We need to find h_2 .

The proportion based on similar triangles is:

$$\frac{h_1}{s_1} = \frac{h_2}{s_2}$$

Step-by-Step Calculation

We can plug the known values into the proportion:

$$\frac{48 \text{ m}}{12 \text{ m}} = \frac{h_2}{14 \text{ m}}$$

First, calculate the ratio for the first pole:

$$\frac{48}{12} = 4$$

This means the height of the first pole is 4 times its shadow length.

Now, substitute this back into the proportion:

$$4 = \frac{h_2}{14 \text{ m}}$$

To solve for h_2 , we multiply both sides of the equation by 14 m:

$$h_2 = 4 \times 14 \text{ m}$$

$$h_2 = 56 \text{ m}$$

Summary of Values

Pole and Shadow Measurements

Measurement	First Pole	Second Pole
Shadow Length (m)	12	14
Height (m)	48	56
Ratio (Height/Shadow)	$48/12 = 4$	$56/14 = 4$

Final Answer

The length (height) of the second pole is 56 meters. The consistent ratio of height to shadow length (4:1) confirms the application of similar triangles.

49. Answer: a

Explanation:

Evaluating an Algebraic Expression Using Ratios

This solution explains how to find the value of the algebraic expression $\frac{3m+n}{6m-n}$ given that the ratio between m and n is 2:3.

Understanding the Given Ratio

We are given the ratio between two variables, m and n , as 2 to 3. This can be written as:

$$m : n = 2 : 3$$

This ratio implies that for some non-zero constant k , we can express m and n as:

$$m = 2k$$

$$n = 3k$$

Alternatively, we can express the ratio as a fraction:

$$\frac{m}{n} = \frac{2}{3}$$

Calculating the Expression's Value

We need to find the value of the expression $\frac{3m+n}{6m-n}$. We can do this by substituting the values of m and n in terms of k into the expression.

Step 1: Substitute Values

Substitute $m = 2k$ and $n = 3k$ into the expression:

$$\frac{3m + n}{6m - n} = \frac{3(2k) + (3k)}{6(2k) - (3k)}$$

Step 2: Simplify the Numerator

Calculate the numerator:

$$3(2k) + 3k = 6k + 3k = 9k$$

Step 3: Simplify the Denominator

Calculate the denominator:

$$6(2k) - 3k = 12k - 3k = 9k$$

Step 4: Calculate the Final Value

Now, divide the simplified numerator by the simplified denominator:

$$\frac{9k}{9k}$$

Since k is a non-zero constant, we can cancel it out:

$$\frac{9k}{9k} = 1$$

Alternative Method: Using the Ratio Fraction

We can also solve this by dividing the numerator and the denominator of the expression by n (assuming $n \neq 0$):

$$\frac{\frac{3m+n}{n}}{\frac{6m-n}{n}} = \frac{\frac{3m}{n} + \frac{n}{n}}{\frac{6m}{n} - \frac{n}{n}}$$

Simplify the terms:

$$\frac{3\left(\frac{m}{n}\right) + 1}{6\left(\frac{m}{n}\right) - 1}$$

Now, substitute the value of the ratio $\frac{m}{n} = \frac{2}{3}$:

$$\frac{3\left(\frac{2}{3}\right) + 1}{6\left(\frac{2}{3}\right) - 1} = \frac{2 + 1}{4 - 1} = \frac{3}{3} = 1$$

Conclusion

Both methods show that the value of the expression $\frac{3m+n}{6m-n}$ when the ratio $m : n$ is 2:3 is 1.

50. Answer: c

Explanation:

Calculating the Cost Price Per Item

First, we need to determine the cost price (CP) for each individual item. We are given that the total cost price for 25 items is Rs. 300.

The formula for the cost price per item is:

$$\text{CP per item} = \frac{\text{Total Cost Price}}{\text{Number of Items}}$$

Substituting the given values:

$$\text{CP per item} = \frac{300}{25} = 12$$

So, the cost price of one item is Rs. 12.

Determining the Selling Price for the First 15 Items

We are told that the first 15 items are sold at a 30% profit.

- Number of items = 15
- Cost Price (CP) of 15 items = Number of items $\times$ CP per item
- $$\text{CP of 15 items} = 15 \times 12 = 180$$
- Profit percentage = 30%
- Profit amount = Profit percentage $\times$ CP of 15 items
- $$\text{Profit amount} = \frac{30}{100} \times 180 = 0.30 \times 180 = 54$$
- Selling Price (SP) = CP + Profit amount
- $$\text{SP of 15 items} = 180 + 54 = 234$$

Alternatively, we can calculate the selling price directly using the formula:

$$\text{SP} = \text{CP} \times (1 + \text{Profit Rate})$$

$$\text{SP of 15 items} = 180 \times \left(1 + \frac{30}{100}\right) = 180 \times (1 + 0.30) = 180 \times 1.30 = 234$$

The selling price for the first 15 items is Rs. 234.

Calculating the Selling Price for the Remaining Items

The remaining items are sold at a 20% profit. First, let's find the number of remaining items and their cost price.

- Total items = 25
- Items sold = 15
- Remaining items = $25 - 15 = 10$
- Cost Price (CP) of 10 items = Number of items $\times$ CP per item
- $$\text{CP of 10 items} = 10 \times 12 = 120$$
- Profit percentage = 20%
- Profit amount = Profit percentage $\times$ CP of 10 items
- $$\text{Profit amount} = \frac{20}{100} \times 120 = 0.20 \times 120 = 24$$

- Selling Price (SP) = CP + Profit amount

- $$\text{SP of 10 items} = 120 + 24 = 144$$

Using the direct formula:

$$\text{SP} = \text{CP} \times (1 + \text{Profit Rate})$$

$$\text{SP of 10 items} = 120 \times \left(1 + \frac{20}{100}\right) = 120 \times (1 + 0.20) = 120 \times 1.20 = 144$$

The selling price for the remaining 10 items is Rs. 144.

Finding the Overall Selling Price

To find the overall selling price of all 25 items, we add the selling prices of the two batches.

- SP of the first 15 items = Rs. 234
- SP of the remaining 10 items = Rs. 144
- Overall Selling Price = SP of 15 items + SP of 10 items
- $$\text{Overall SP} = 234 + 144 = 378$$

Therefore, the overall selling price of the 25 items is Rs. 378.

Your Personal Exams Guide

51. Answer: d

Explanation:

Locating the Salar Jung Museum in India

This section provides a clear explanation regarding the geographical placement of the renowned **Salar Jung Museum** within the country of India.

Understanding the Salar Jung Museum

The **Salar Jung Museum** is recognized as one of India's most significant art museums. It hosts an extensive and diverse collection that includes artifacts, sculptures, paintings, and decorative arts sourced from various historical periods and cultures worldwide. The museum is a treasure trove for art enthusiasts and historians.

Identifying the Salar Jung Museum's Location

The question asks for the specific location of the **Salar Jung Museum** in India. Let's examine the options:

- **Option 1: Jaipur** – Jaipur, the capital of Rajasthan, is famous for its historical architecture and palaces, but it is not the location of the Salar Jung Museum.
- **Option 2: Patna** – Patna, the capital of Bihar, is known for its historical significance, particularly its ancient past as Pataliputra. However, the Salar Jung Museum is not located here.
- **Option 3: Lucknow** – Lucknow, the capital of Uttar Pradesh, is celebrated for its Nawabi culture and historical monuments. This city does not house the Salar Jung Museum.
- **Option 4: Hyderabad** – Hyderabad is the capital city of Telangana. This vibrant city is indeed the location of the prestigious **Salar Jung Museum**. It is situated on the southern bank of the Musi River.

Confirmation of Salar Jung Museum Site

The **Salar Jung Museum** is a major landmark located in **Hyderabad**, Telangana. Therefore, option 4 correctly identifies the city where this esteemed institution is situated.

52. Answer: a

Explanation:

Determining When Delhi Became India's Capital

This question requires knowledge of a significant historical event in India's administrative history: the shift of the capital city. We need to identify the correct year when **Delhi** was designated as the **capital of India**.

Historical Background: Calcutta to Delhi

Prior to the specific year in question, the capital of British India was Calcutta (now Kolkata). A major announcement was made during a grand royal event that changed the administrative centre.

- The decision to move the capital from Calcutta to Delhi was a key policy change.
- This historical shift recognized Delhi's long-standing significance as a centre of power and administration throughout different periods of Indian history.

The Year Delhi Became Capital

The official announcement and decision to make **Delhi** the new **capital of India** occurred in **1911**. This announcement was made by King George V and Queen Mary during the Delhi Durbar, an important imperial assembly held in Delhi.

Key details about the event:

- **Event:** Delhi Durbar
- **Date of Announcement:** December 12, 1911
- **Significance:** Marked the official decision to shift the capital from Calcutta to Delhi.

While the physical construction and full transfer of government operations took time beyond 1911, this year remains the crucial point when the change was decided and declared, establishing Delhi's role as the capital.

Understanding the Options

Reviewing the options provided:

- **1911:** This year aligns with the historical records of the announcement made at the Delhi Durbar.
- **1913:** This year falls after the official decision.
- **1910:** This year precedes the announcement.
- **1909:** This year also precedes the announcement.

Based on the historical facts, **1911** is the correct year when Delhi was made the capital of India.

53. Answer: c

Explanation:

Key Elements in Teeth and Bones Explained

Teeth and bones are vital structural components of the body, providing support, protection, and enabling movement. Their hardness and strength come from their mineral composition. Understanding the elements that make up these tissues is crucial in biology and health sciences.

Composition of Teeth and Bones

The primary mineral component of both teeth (enamel and dentin) and bones is a crystalline substance called Hydroxyapatite. This complex mineral salt is primarily composed of calcium and phosphate ions.

- **Hydroxyapatite Formula:** The chemical formula for Hydroxyapatite is typically represented as $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$.
- **Role of Calcium (Ca^{2+}):** Calcium ions (Ca^{2+}) are essential cations that form the backbone of the Hydroxyapatite crystal structure. They provide rigidity and strength.
- **Role of Phosphorus (PO_4^{3-}):** Phosphorus is primarily present in the form of phosphate ions (PO_4^{3-}) within the Hydroxyapatite structure. These ions link with calcium ions to form the stable mineral matrix.

- **Other Minerals:** While Calcium and Phosphorus are the most abundant mineral elements, trace amounts of other minerals like Magnesium ($< \text{Mg} >$), Fluoride ($< \text{F} >$), and Carbonate ($< \text{CO}_3^{2-} >$) can also be found, modifying the properties of the bone and teeth. However, Calcium and Phosphorus are the fundamental building blocks.

Analysis of Options

Let's examine the given options to identify the correct pair of elements found in teeth and bones:

- **Option 1: Potassium and Calcium**
 - Calcium ($< \text{Ca} >$) is a major component, essential for the mineral structure.
 - Potassium ($< \text{K} >$) is an important electrolyte in the body, vital for nerve and muscle function, but it is not a primary structural mineral element in teeth and bones like Calcium or Phosphorus.
- **Option 2: Calcium and Magnesium**
 - Calcium ($< \text{Ca} >$) is a primary component.
 - Magnesium ($< \text{Mg} >$) is present in bones and teeth, playing a role in bone formation and density, but it is typically found in smaller quantities compared to Calcium and Phosphorus.
- **Option 3: Calcium and Phosphorus**
 - Calcium ($< \text{Ca} >$) and Phosphorus ($< \text{P} >$) are the two most abundant mineral elements in teeth and bones.
 - They combine to form the mineral Hydroxyapatite, which gives these tissues their characteristic hardness and strength.
- **Option 4: Phosphorus and Sulfur**
 - Phosphorus ($< \text{P} >$) is a key component as part of the phosphate ions in Hydroxyapatite.
 - Sulfur ($< \text{S} >$) is found in the body, notably in amino acids like cysteine and methionine, which are components of proteins such as collagen (abundant in bone matrix). However, Sulfur is not a primary mineral constituent of the hard tissue structure itself in the same way Calcium and Phosphorus are.

Conclusion on Teeth and Bone Elements

Based on the analysis of the primary mineral composition, the elements most significantly found in the structure of teeth and bones are Calcium and Phosphorus, forming the critical mineral matrix.

54. Answer: c

Explanation:

Constitution of India: Understanding the Adoption Date

The question asks for the specific date when the Constitution of India was adopted. The Constituent Assembly of India was tasked with drafting the Constitution, and understanding the key dates related to this process is important.

Significance of November 26, 1949

The Constitution of India was formally adopted on **November 26, 1949**. On this momentous day, the President of the Constituent Assembly signed the Constitution of India. While the Constitution was adopted on this date, many of its provisions came into effect later. This date is celebrated as National Law Day or Constitution Day in India.

Analysis of Other Key Dates

It's useful to understand why the other dates provided are not the adoption date:

- **August 15, 1947:** This date marks India's Independence Day, the day India gained freedom from British rule. It is not the date the Constitution was adopted.
- **November 26, 1947:** While this date falls within the constitution-making period, it is not the date of adoption.

- **January 26, 1950:** This date is known as Republic Day. It is the date when the Constitution of India officially came into effect, and India was declared a sovereign democratic republic. While closely related, it is the date of implementation, not adoption.

Conclusion on Constitution Adoption

Therefore, the correct date when the Constitution of India was adopted by the Constituent Assembly is **November 26, 1949**.

55. Answer: b

Explanation:

Identifying India's First National Park

This explanation aims to identify the **first national park established in India** from the provided options, focusing on the historical context of wildlife conservation in the country.

Historical Overview of Indian National Parks

India boasts a network of national parks dedicated to preserving its diverse flora and fauna. The establishment of the **first national park** signifies the beginning of formal conservation efforts in the nation. Let's examine the options based on their establishment dates.

Detailed Analysis of Options

- **Bandipur National Park:** Located in the state of Karnataka, Bandipur was established as a national park in 1974. It is primarily known for its tiger and elephant populations.
- **Jim Corbett National Park:** Situated in the state of Uttarakhand, this park holds the distinction of being the **first national park established in India**. It was

founded in 1936 and was initially named Hailey National Park. Its creation was a pioneering effort in wildlife protection, particularly for the Bengal tiger.

- **Kanha National Park:** This significant wildlife area is located in Madhya Pradesh. While Kanha Tiger Reserve was established earlier, the designation as a national park occurred after Jim Corbett National Park.
- **Periyar National Park:** Located in the Western Ghats of Kerala, Periyar was established as a national park in 1982. It is renowned for its elephant and tiger populations and its scenic reservoir.

The Significance of Jim Corbett National Park

Established in 1936, Jim Corbett National Park is the oldest national park in India. It was originally established to protect the endangered species like the Royal Bengal Tiger. Renamed in honor of the famed British-Indian tracker and naturalist, Jim Corbett, it remains a vital sanctuary for wildlife and a testament to early conservation initiatives in India.

Conclusion on the First National Park

Comparing the establishment dates, Jim Corbett National Park (1936) clearly precedes Bandipur National Park (1974), Kanha National Park (later designation), and Periyar National Park (1982). Therefore, Jim Corbett National Park is recognized as the first national park established in India.

56. Answer: c

Explanation:

Christopher Reid's Sporting Association Revealed

This explanation focuses on identifying the specific sport Christopher Reid is most recognized for, aligning with the multiple-choice options provided.

Who is Christopher Reid in Sports?

Christopher Reid is an athlete known within the sports community. The core task is to link him to the correct discipline from the list: Boating, Racing, Swimming, or Boxing.

Examining the Sport Options for Christopher Reid

We will look at each option to determine Christopher Reid's connection:

- **Boating:** This involves activities on water using boats. Christopher Reid is not primarily known for competitive boating.
- **Racing:** This is a general term for competitive speed events. While swimming involves racing, "Racing" itself isn't specific enough to pinpoint Reid's main sport.
- **Swimming:** Christopher Reid has a well-documented background as a professional swimmer. His career achievements and public profile are strongly tied to competitive swimming events.
- **Boxing:** This is a combat sport involving punches. There is no known association between Christopher Reid and the sport of boxing.

Identifying Christopher Reid's Primary Sport

Considering the available information, Christopher Reid's athletic identity is most strongly linked to **Swimming**. He is recognized for his participation and achievements in this aquatic sport.

57. Answer: a

Explanation:

Decoding the AEW&C Abbreviation

Understanding abbreviations is crucial, especially in specialized fields like aviation and defense. The question asks us to identify the meaning of the abbreviation AEW&C. Let's break down this abbreviation to find its correct expansion.

Understanding the Components of AEW&C

The abbreviation **AEW&C** is commonly used in aviation and military contexts. We need to determine what each letter or part of the abbreviation stands for:

- **A** typically stands for **Airborne**. This refers to something operating or located in the air.
- **E** stands for **Early**. This signifies detection or warning at an initial stage.
- **W** stands for **Warning**. This implies a system designed to alert or signal potential threats or danger.
- **&C** stands for **and Control**. This indicates that the system not only provides warnings but also has capabilities for controlling or coordinating operations, often related to aircraft or air defense.

Analyzing the Options for AEW&C

Let's examine the provided options in light of our breakdown of the **AEW&C** abbreviation:

- **Option 1: Airborne Early Warning and Control System** – This matches our component breakdown perfectly: **Airborne**, **Early**, **Warning**, and **Control System**.
- **Option 2: Aircraft Early Warning and Control System** – While related, 'Airborne' is more specific than 'Aircraft' when referring to the platform carrying the system. 'Airborne' emphasizes the operational status (in the air).
- **Option 3: Aero Engine Warning and Controlling System** – This option changes the meaning significantly. 'Aero Engine' focuses on a specific part (the engine), and 'Controlling' is misspelled with an extra 'l'. This doesn't fit the typical usage of **AEW&C**.
- **Option 4: Aero Engine Warn and Control System** – Similar to option 3, this focuses on 'Aero Engine' instead of the broader 'Airborne' concept. It also uses 'Warn' instead of 'Warning', which is less common in formal system names.

Conclusion on AEW&C Meaning

Based on the standard terminology used in aviation and defense, the abbreviation **AEW&C** refers to a system that operates from an airborne platform to provide early

warning and facilitate control of air operations. Therefore, the most accurate and widely accepted meaning for the **AEW&C** abbreviation is **Airborne Early Warning and Control System**.

58. Answer: d

Explanation:

Identifying the Game Associated with "Bully"

This section explains the specific sport linked to the term "**Bully**", providing clarity on sports terminology.

Understanding the Term "Bully" in Sports Context

In sports, specific actions and restarts often have unique names. Understanding these terms is key to knowing the rules and flow of different games. The question asks us to identify which **game** uses the term "bully".

"Bully" in Hockey Explained

The term "**Bully**" is a well-established part of the game of **Hockey**. It refers to a specific method used to restart play after the game has been stopped for certain reasons.

- **How it works:** In a hockey bully, two players from opposing teams face each other. The ball is placed on the ground between the feet of these two players.
- **The Action:** Each player must tap the ground with their hockey stick, then tap the opponent's stick, after which they can try to gain control of the ball.
- **Purpose:** This action ensures fair play when restarting the game, especially after a stoppage where determining who should restart play isn't straightforward.

This technique is a distinctive feature of **Hockey**.

Analysis of Other Game Options

The term "bully" is not traditionally used in the other sports mentioned:

- **Cricket:** Key terms in cricket include 'over', 'wicket', 'run', 'boundary', and 'appeal'. "Bully" is not part of cricket's official terminology.
- **Football:** Football (soccer) restarts play through 'kick-offs', 'throw-ins', 'corner kicks', and 'goal kicks'. The term "bully" is not used in football.
- **Golf:** Golf involves terms like 'tee', 'drive', 'putt', 'fairway', and 'green'. "Bully" has no relevance in the terminology of golf.

Conclusion on "Bully" Terminology

Based on the standard rules and common vocabulary used in various sports, the term "**Bully**" is specifically associated with the sport of **Hockey**.

59. Answer: c

Explanation:

Chukkars and Their Relation to Sports

The question asks to identify the game associated with the term **chukkars**.

Understanding specific terminology is key to recognizing different sports and their unique elements.

Understanding the Term 'Chukkars'

The word **chukkar** (often spelled 'chukker') refers to a specific unit of time or period within a game. It's a fundamental concept for anyone following the sport it belongs to.

Association with Polo

The term **chukkars** is most prominently used in the sport of **Polo**. In **Polo**, a match is divided into several short periods of play called **chukkars**. Each **chukkar** typically lasts for 7 minutes. A professional **Polo** match usually consists of six **chukkars**, although this can vary depending on the tournament or level of play. The breaks between **chukkars** allow players and horses to rest and strategize.

Context in Other Games

It's important to note that the term **chukkars** is not used in the other sports mentioned:

- **Golf**: The game of **Golf** is played over a course of 18 holes. While there are breaks, they are not referred to as **chukkars**.
- **Table Tennis**: In **Table Tennis**, play is divided into points, games, and sets. The term **chukkar** is irrelevant here.
- **Tennis**: Similarly, **Tennis** is structured into games, sets, and matches. The terminology used is different from that of **Polo**.

Therefore, the term **chukkars** is specifically linked to the equestrian sport of **Polo**.

60. Answer: a

Explanation:

Identifying the Originator of the "Blood and Freedom" Slogan

The powerful and evocative slogan, "Give me blood and I shall give you freedom", is widely recognized as being delivered by the influential Indian freedom fighter, Subhas Chandra Bose.

Subhas Chandra Bose: A Leader's Call to Sacrifice

Subhas Chandra Bose, revered as Netaji, was a charismatic leader in India's fight for independence. He advocated for a more assertive and, at times, militant approach to achieving freedom from British colonial rule.

The slogan, often cited in its Hindi version "Tum Mujhe Khoon Do, Main Tumhe Azaadi Doonga", encapsulates Bose's philosophy during a critical phase of the independence struggle. It was a direct appeal to the people of India, especially the soldiers of the Indian National Army (INA), to demonstrate courage and willingness to make the ultimate sacrifice.

Bose believed that freedom was not merely a goal to be wished for but a prize to be won through determined effort and sacrifice. This slogan was his way of motivating Indians to actively participate in the fight, understanding that achieving independence would demand immense courage and potential loss of life in the battle against oppression.

Historical Context of the Slogan

During World War II, Subhas Chandra Bose sought external support to challenge British authority. He formed the Azad Hind government and the Indian National Army (INA) with the objective of launching an armed insurrection. The slogan "Give me blood and I shall give you freedom" was a rallying cry during this period, intended to galvanize support and commitment for the cause from both Indian soldiers and the general populace.

Distinguishing Bose's Slogan from Others

It is important to associate the correct slogans with the respective leaders of the Indian independence movement:

- **Subhas Chandra Bose:** Famous for "Give me blood and I shall give you freedom".
- **Bhagat Singh:** Associated with the revolutionary slogan "Inquilab Zindabad".
- **Jawaharlal Nehru:** A key figure in the Congress, often linked with the goal of 'Purna Swaraj' and India's future as a secular, democratic republic.

- **Bal Gangadhar Tilak:** Credited with the powerful declaration "Swaraj is my birthright, and I shall have it".

Therefore, the specific call for sacrifice in exchange for freedom is a hallmark of Subhas Chandra Bose's inspirational leadership.

61. Answer: d

Explanation:

Punjab Kesari Title Explained

The title '**Punjab Kesari**', which translates to 'Lion of Punjab', is a prestigious epithet awarded to a prominent leader recognized for his immense contribution, courage, and influence in the Punjab region of India.

Identifying the Punjab Kesari

Among the options provided, the leader famously known as 'Punjab Kesari' was **Lala Lajpat Rai**.

Detailed Analysis of Lala Lajpat Rai

- **Lala Lajpat Rai** was a key figure in the Indian independence movement.
- He was a strong nationalist and a leader of the 'Lal Bal Pal' trio (Lala Lajpat Rai, Bal Gangadhar Tilak, and Bipin Chandra Pal), advocating for India's self-rule.
- His active participation in political protests, social reforms, and educational initiatives in Punjab earned him widespread admiration and respect.
- He was particularly known for his fiery speeches and unwavering stance against British rule, especially during the protest against the Simon Commission, where he was tragically lathi-charged and later succumbed to his injuries.
- His bravery and leadership in Punjab led to him being bestowed with the title 'Punjab Kesari'.

Other Leaders and Their Titles

While the other individuals listed were also significant leaders during India's struggle for freedom, they are not primarily associated with the title 'Punjab Kesari':

- **Mahatma Gandhi:** Reverently known as the 'Father of the Nation' or 'Bapu'.
- **Bhagat Singh:** A revolutionary socialist who is remembered for his patriotism and sacrifice.
- **Jawaharlal Nehru:** India's first Prime Minister, often referred to as 'Pandit Nehru'.

Conclusion on the Punjab Kesari

Therefore, based on historical recognition and popular association, **Lala Lajpat Rai** is the correct answer for the leader known as 'Punjab Kesari'.

62. Answer: c

Explanation:

Understanding the 'Napoleon of India' Title

The title 'Napoleon of India' is a historical epithet used to describe a powerful Indian ruler whose military conquests and empire-building activities were reminiscent of Napoleon Bonaparte. This nickname highlights the ruler's significant military genius, vast territorial expansion, and effective administration.

Analyzing Gupta Empire Rulers

The question asks to identify the Indian ruler known by this specific title. Let's look at the prominent rulers of the Gupta Empire mentioned in the options:

- **Chandragupta II:** Also known as Vikramaditya, he was a notable ruler who presided over a flourishing period of Gupta rule, marked by cultural and economic prosperity.

- **Skandagupta:** He is known for defending the Gupta Empire against the Huna invasions, showcasing military capability.
- **Samudragupta:** The second ruler of the Gupta Empire, his reign was characterized by extensive military campaigns and the consolidation of Gupta power.
- **Kumaragupta:** Founder of the Nalanda University, his reign was generally peaceful, although he faced challenges later on.

Samudragupta's Military Prowess

Historians widely associate the title 'Napoleon of India' with **Samudragupta** due to his remarkable military achievements. His success in warfare and expansion of the Gupta Empire across the Indian subcontinent earned him this comparison.

- **Extensive Conquests:** Samudragupta is credited with launching numerous military expeditions. According to the Allahabad Pillar inscription (Prayaga Prashasti), he conquered many kingdoms in Northern India and defeated several rulers in the South.
- **Unbeaten Record:** His military campaigns were highly successful, and he was described as being undefeated in battle.
- **Vast Empire:** He significantly expanded the Gupta Empire, bringing many territories under his direct control or influence. His military strategies and leadership skills were exceptional for his time.
- **Historical Comparison:** The historian Vincent A. Smith coined this phrase, comparing Samudragupta's military genius and the extent of his conquests to that of Napoleon Bonaparte.

Why Samudragupta is Called the 'Napoleon of India'

Samudragupta's military leadership, strategic victories, and the vast expansion of his empire mirror the characteristics of Napoleon Bonaparte. His ability to subdue numerous opponents and consolidate power across a large territory led to the famous comparison, cementing his place as a formidable military leader in ancient Indian history.

63. Answer: c

Explanation:

Identifying Forts Not Built by Akbar

This question asks to identify which of the listed forts was **not** constructed by the Mughal Emperor Akbar. To answer this, we need to examine the historical construction details of each fort mentioned in the options.

Akbar's Architectural Contributions

Emperor Akbar, during his reign (1556–1605), was a significant patron of architecture and commissioned the construction of many impressive buildings and forts across the Mughal Empire. Key examples include forts at Agra, Allahabad, and Lahore.

Analysis of Listed Forts

- **Lahore Fort:** Emperor Akbar initiated the major reconstruction of the Lahore Fort around 1570. He added significant structures, making it a major Mughal administrative center. Therefore, Akbar was involved in building parts of the Lahore Fort.
- **Allahabad Fort:** This massive fort was built by Emperor Akbar in 1583 AD. Its strategic location at the confluence of the Ganga and Yamuna rivers made it important during his reign. So, Allahabad Fort was built by Akbar.
- **Gwalior Fort:** The history of Gwalior Fort is much older than Akbar's reign. While various rulers modified and added to it over centuries, its origins trace back much further. Significant construction phases occurred before the Mughal era, notably by the Tomar dynasty in the 15th century. Akbar visited the fort and utilized it, but he is not considered its builder.
- **Agra Fort:** Akbar rebuilt the Agra Fort, starting the work in 1565 AD. He used red sandstone extensively, creating the massive structure that exists today, serving as the main residence of the Mughal emperors. Thus, Agra Fort was built by Akbar.

Conclusion on Gwalior Fort

Comparing the construction history of the forts, Gwalior Fort stands out as a structure whose primary construction predates Emperor Akbar's reign. While other forts like Lahore, Allahabad, and Agra were either built or significantly reconstructed under Akbar's patronage, Gwalior Fort has a much longer and varied architectural history.

Therefore, the fort that was **not** built by Akbar among the given options is Gwalior Fort.

64. Answer: b

Explanation:

Understanding the IPL 2020 Venue

The Indian Premier League (IPL) is a major professional Twenty20 cricket league in India. Each year, the tournament usually takes place in various cities across India. However, the IPL 2020 season had unique circumstances that led to a change in its traditional venue.

Exploring the IPL 2020 Tournament Location

The IPL 2020 tournament faced significant challenges due to the global COVID-19 pandemic. The health and safety of players, support staff, and fans were paramount. Initially planned for India, the tournament had to be postponed and eventually relocated. After careful consideration and evaluation of safety protocols, the Board of Control for Cricket in India (BCCI) decided to shift the entire IPL 2020 season to a different country.

Identifying the Official IPL 2020 Venue

The chosen **venue** for the entirety of the **IPL 2020** season was the **United Arab Emirates (UAE)**. This decision allowed the tournament to proceed safely while adhering to strict health guidelines. The UAE provided a bio-secure environment, ensuring the smooth conduct of all matches.

Specific Venues within the UAE

The matches during the **IPL 2020** were primarily held in three Emirates cities:

- Dubai
- Abu Dhabi
- Sharjah

These locations effectively hosted the league matches, playoffs, and the final, making the **United Arab Emirates** the sole **venue** for the **IPL 2020** tournament.

Comparison with Other Potential Venues

Let's look at why the other options were not the venue for IPL 2020:

- **India:** While the usual home of the IPL, the pandemic situation in India at the time made it unsafe to host the tournament.
- **Australia:** Although Australia is a major cricket-playing nation and hosted international tournaments, the specific decision for IPL 2020 was to move it to the UAE.
- **UK:** Similar to Australia, the UK did not serve as the host country for the IPL 2020 season. The UAE was selected for logistical and health-related reasons.

Therefore, the correct **venue** for the **IPL 2020** was the **United Arab Emirates**.

65. Answer: a

Explanation:

Vienna's Identity as a National Capital

The question asks to identify the country for which Vienna is the national capital and largest city. This involves knowing the capitals of various European and Middle Eastern nations.

Identifying Vienna's Nation

We need to determine which of the given options correctly associates Vienna with its role as a nation's capital and largest urban center.

Evaluating the Choices

- **Austria:** Vienna is the official national capital of Austria. It is also the country's largest city by population and a major political, economic, and cultural hub.
- **Russia:** The capital of Russia is Moscow, which is also its largest city. Vienna is not the capital of Russia.
- **Spain:** Madrid serves as the capital and largest city of Spain. Vienna has no relation to Spain's capital status.
- **Syria:** Damascus is the capital and largest city of Syria. Vienna is not associated with Syria.

Confirming Vienna's Capital Status

Based on established geopolitical facts, Vienna holds the distinction of being the national capital and largest city of **Austria**. The other countries listed have different capital cities.

66. Answer: b

Explanation:

Kitab ul Hind Author Identification

The question asks to identify the author of the renowned Arabic book titled “**Kitab ul Hind**”. This book provides a comprehensive account of India during the medieval

period.

Exploring the Author of Kitab ul Hind

Let's analyze the options to determine the correct author:

- **Al-Biruni:** Abu Rayhan al-Biruni, often referred to simply as Al-Biruni, was a Persian polymath who lived from 973 to 1048 CE. He was a prominent scholar, mathematician, astronomer, physicist, historian, geographer, and linguist. He traveled extensively and served under various rulers. Al-Biruni accompanied Sultan Mahmud of Ghazni during his invasions of India and stayed in the region for several years. During his stay, he learned Sanskrit and studied Indian culture, religion, science, and history extensively. His meticulous research resulted in the composition of "**Kitab ul Hind**" (also known as "Tarikh al-Hind" or "Indica"). This seminal work is celebrated for its detailed and objective descriptions of Indian society, philosophy, geography, and sciences, offering invaluable insights into the subcontinent during that era.
- **Birbal:** Birbal was a Hindu advisor in the court of the Mughal Emperor Akbar in the 16th century. He was known for his intelligence and wit, often featured in popular folktales. However, he did not author the Arabic book "**Kitab ul Hind**".
- **Mahmood:** This is a common name and could refer to various historical figures, most notably Sultan Mahmud of Ghazni, who patronized scholars but is not the author of "**Kitab ul Hind**" himself.
- **Mohammed:** Like Mahmood, Mohammed is a very common name and does not correspond to the author of this specific historical text.

Conclusion on Kitab ul Hind Authorship

Based on historical records and the context of the book's content and creation, **Al-Biruni** is definitively the author of the famous Arabic book "**Kitab ul Hind**". His work remains a vital source for understanding India in the 11th century.

67. Answer: d

Explanation:

Gas Weight Comparison Using the Periodic Table

This explanation focuses on identifying the lightest gas among the given options: Oxygen, Methane, Nitrogen, and Hydrogen. Determining the lightest gas involves understanding molecular weights, which can be found using the periodic table.

Calculating Molecular Weights for Each Gas

The weight of a gas is determined by its molecular formula and the atomic weights of its constituent elements. We can calculate the approximate molecular weight for each gas option:

- **Oxygen (O_2):** Oxygen is a diatomic molecule. The atomic weight of Oxygen (O) from the periodic table is approximately 16 grams per mole (g/mol). Therefore, the molecular weight of Oxygen gas (O_2) is calculated as:

$$\text{Molecular Weight of } O_2 = 2 \times (\text{Atomic Weight of O})$$

$$\text{Molecular Weight of } O_2 = 2 \times 16 \text{ g/mol} = 32 \text{ g/mol}$$

- **Methane (CH_4):** Methane consists of one Carbon (C) atom and four Hydrogen (H) atoms. The atomic weight of Carbon (C) is approximately 12 g/mol, and the atomic weight of Hydrogen (H) is approximately 1 g/mol. The molecular weight is:

$$\text{Molecular Weight of } CH_4 = (\text{Atomic Weight of C}) + 4 \times (\text{Atomic Weight of H})$$

$$\text{Molecular Weight of } CH_4 = 12 \text{ g/mol} + 4 \times 1 \text{ g/mol} = 12 + 4 = 16 \text{ g/mol}$$

- **Nitrogen (N_2):** Nitrogen is also a diatomic molecule. The atomic weight of Nitrogen (N) from the periodic table is approximately 14 g/mol. The molecular weight of Nitrogen gas (N_2) is:

$$\text{Molecular Weight of } N_2 = 2 \times (\text{Atomic Weight of N})$$

$$\text{Molecular Weight of } N_2 = 2 \times 14 \text{ g/mol} = 28 \text{ g/mol}$$

- **Hydrogen (H_2):** Hydrogen exists as a diatomic molecule. The atomic weight of Hydrogen (H) from the periodic table is approximately 1 g/mol. The molecular weight of Hydrogen gas (H_2) is calculated as:

$$\text{Molecular Weight of } H_2 = 2 \times (\text{Atomic Weight of H})$$

$$\text{Molecular Weight of } H_2 = 2 \times 1 \text{ g/mol} = 2 \text{ g/mol}$$

Comparison of Gas Molecular Weights

Comparing the calculated molecular weights helps us determine which gas is the lightest:

Gas	Molecular Formula	Molecular Weight (g/mol)
Oxygen	O_2	32
Methane	CH_4	16
Nitrogen	N_2	28
Hydrogen	H_2	2

From the table and calculations, we can see that Hydrogen (H_2) has the lowest molecular weight (2 g/mol) among the given options.

Conclusion: The Lightest Gas

Based on the molecular weight calculations derived from the periodic table, Hydrogen is the lightest gas among Oxygen, Methane, and Nitrogen.

68. Answer: c

Explanation:

First Asian Secretary-General of the UNO Identified

This question asks us to identify which among the given options was the very first person from Asia to serve as the Secretary-General of the United Nations Organization (UNO).

U Thant's Background and UNO Role

U Thant was a diplomat and politician from Burma (now known as Myanmar), a nation situated in Southeast Asia. His appointment to the highest office within the United Nations was a historic moment, making him the **first Asian** leader to hold the title of Secretary-General.

- **Nationality:** U Thant was Burmese (from Myanmar).
- **Key Achievement:** He holds the distinction of being the **first Asian** Secretary-General of the UNO.
- **Term of Service:** His service spanned from 1961 to 1971. He was initially appointed as the acting Secretary-General in November 1961 and subsequently confirmed for a full five-year term beginning in 1962.

Examining Other Candidates

Let's briefly consider the other individuals listed in the options to understand why they are not the correct answer:

- **Madeleine Albright:** While she held significant diplomatic roles, including U.S. Ambassador to the UN and U.S. Secretary of State, she was from Czechoslovakia/USA and not the first Asian Secretary-General.
- **Fathimath Dhiyana Saeed:** She is a politician from the Maldives, which is in Asia. However, she has never served as the Secretary-General of the UNO.
- **António Guterres:** He is the current Secretary-General of the UNO. He comes from Portugal, a European country, not Asia.

Final Confirmation

Considering the nationalities and roles of the individuals mentioned, **U Thant** is confirmed as the first person of Asian origin to be appointed as the Secretary-General of the United Nations. His leadership period was significant for the UN and its global representation.

69. Answer: c

Explanation:

Option 3 is correct, i.e. New York.

- The **headquarters** of the United Nations is a complex in New York City, designed by Brazilian architect Oscar Niemeyer.
- It was established in 1945 under the Charter of the United Nations
- The General Assembly occupies a central position as the chief deliberative, policymaking and representative organ of the United Nations.
- It is responsible for making the budget of the UN.
Appointment of the non-permanent members to the Security Council.
Appointment of the Secretary-General of the United Nations.
- All 193 member states of the United Nations Organization are represented in the General Assembly.
- Each of the 193 Member States in the Assembly has one vote but votes taken on designated important issues such as recommendations on peace and security, the election of Security Council and Economic and Social Council members, and budgetary questions require a two-thirds majority of Member States
- Every year in September, all the Members meet at Headquarters in New York for the General Assembly session.
- During the 74th Session (2019-2020), Ghana occupies the first seat in the Hall.

★ Additional Information

UN General Assembly:

- President: **Abdulla Shahid**

- Headquarters: New York, United States
- Founded: 1945, New York, United States

70. Answer: b

Explanation:

Locating Continents Crossed by the Tropic of Cancer

The Tropic of Cancer is a significant line of latitude on Earth. It represents the northernmost latitude at which the Sun can be directly overhead at noon. This astronomical event occurs during the summer solstice in the Northern Hemisphere, usually around June 21st. Geographically, the Tropic of Cancer is located at approximately 23.5 degrees North latitude. This value can be expressed using LaTeX notation as 23.5° N.

Continents Intersected by the Tropic of Cancer

To answer the question about which continent the Tropic of Cancer does not pass through, it's helpful to know the continents it does cross. The Tropic of Cancer traverses parts of three continents:

- **North America:** The line passes through Mexico and touches some islands located in the Atlantic Ocean.
- **Africa:** It crosses a substantial portion of the African continent. Key countries it passes through include Western Sahara, Mauritania, Mali, Algeria, Libya, Egypt, Sudan, and Eritrea.
- **Asia:** The Tropic of Cancer also extends across parts of Asia. It traverses countries like Saudi Arabia, Oman, United Arab Emirates, India, Bangladesh, Myanmar, China, and Taiwan.

Identifying the Continent Not Crossed by the Tropic of Cancer

Considering the geographical path of the Tropic of Cancer (23.5° N), it is evident that it does not extend into the continent of **South America**. This continent lies mainly in the Southern Hemisphere. The corresponding line of latitude in the Southern Hemisphere is the Tropic of Capricorn, which is located at approximately 23.5° S latitude and does pass through parts of South America, including countries like Brazil, Paraguay, Argentina, and Chile.

Therefore, based on its geographical location, **South America** is the continent that the Tropic of Cancer does not pass through.

71. Answer: d

Explanation:

Gondwana Hills Location Verified

This solution addresses the question regarding the geographical location of the **Gondwana hills**. Identifying the correct Indian state is key to answering this question accurately.

Pinpointing Gondwana Hills in India

The term "Gondwana" is historically significant, referring to the ancient supercontinent. In India, geological formations and associated topographical features named after this period are found in specific regions. The **Gondwana hills** are prominently situated in central India.

Geographical consensus confirms that the hills referred to as **Gondwana hills** are primarily located within the state of **Madhya Pradesh**. This region holds substantial geological importance due to its Gondwana rock sequences.

Evaluating Geographical Options

To confirm the location, let's briefly examine the options provided:

- **Madhya Pradesh:** This state is widely recognized as the location for the Gondwana hills, due to its geological strata belonging to the Gondwana sequence.
- **Rajasthan:** This northwestern state has distinct geographical features but is not associated with the Gondwana hills.
- **Uttar Pradesh:** Primarily known for its Gangetic plains, Uttar Pradesh does not contain the Gondwana hills.
- **Uttarakhand:** Situated in the northern Himalayan region, Uttarakhand is geographically distinct from the area of the Gondwana hills.

Based on this geographical analysis, the state housing the **Gondwana hills** is **Madhya Pradesh**.

72. Answer: c

Explanation:

'Das Kapital' Authorship Explored

This question requires identifying the author of the significant work titled 'Das Kapital'. Understanding the authorship of foundational texts like this is crucial for grasping their context and impact in fields such as economics and political science.

Understanding 'Das Kapital'

'Das Kapital', often translated as 'Capital', is a comprehensive critique of political economy and the capitalist mode of production. Published in multiple volumes, the first volume appeared in 1867. The work delves into the nature of value, the dynamics of capital accumulation, the concept of surplus value, and the inherent contradictions within the capitalist system.

Key Figure: Karl Marx

The primary author responsible for the intellectual foundation and initial volumes of 'Das Kapital' is:

- **Karl Marx:** A renowned philosopher, economist, and sociologist, Karl Marx authored Volume 1 of 'Das Kapital'. His extensive research and analysis formed the core of this seminal work. Volumes 2 and 3 were later compiled and published by his close associate, Friedrich Engels, using Marx's detailed notes and manuscripts after his death.

Evaluating Other Options

To confirm the correct author, let's consider the contributions of the other individuals mentioned:

- **Friedrich Engels:** Friedrich Engels was a lifelong collaborator and friend of Karl Marx. He co-authored several works with Marx, including 'The Communist Manifesto', and played a vital role in editing and publishing Volumes 2 and 3 of 'Das Kapital'. However, he is not credited as the original author of the work.
- **G.W.F Hegel:** Georg Wilhelm Friedrich Hegel was a highly influential German philosopher whose dialectical method significantly impacted Marx's thinking. Hegel's own works focused on philosophy, logic, and history, not the economic analysis found in 'Das Kapital'.
- **Max Weber:** Max Weber was a prominent German sociologist and economist known for his studies on bureaucracy, religion, and the sociology of economic life, including works like 'The Protestant Ethic and the Spirit of Capitalism'. His perspective and contributions are distinct from those presented in 'Das Kapital'.

In summary, Karl Marx is the author of 'Das Kapital', a work that remains highly influential in critical economic thought.

73. Answer: b

Explanation:

The correct answer is **Helmut Kohl** .

- Kohl's 16-year tenure was the longest of any German Chancellor since Otto von Bismarck. He oversaw the end of the Cold War and the German reunification, for which he is generally known as Chancellor of Unity.

★ Additional Information

- Former Chancellor Helmut Kohl, the architect of Germany's 1990 reunification and mentor to Angela Merkel, has died at age 87 in 2017.

74. Answer: b

Explanation:

First Batsman Six 6's in World T20

The question asks to identify the **first batsman** to achieve the remarkable feat of scoring **six 6's** (six consecutive sixes) in a single over during the **World T20** (now known as the T20 World Cup).

Yuvraj Singh's Historic T20 World Cup Achievement

This incredible batting milestone was achieved by Indian cricketer **Yuvraj Singh**.

- **Who:** Yuvraj Singh
- **What:** Scored six consecutive sixes in one over.
- **Where:** ICC World T20 tournament.
- **When:** September 19, 2007.
- **Against Whom:** England.
- **Bowler Hit For Sixes:** Stuart Broad.

World T20 Six Sixes Record Explained

Yuvraj Singh's explosive hitting against England in the semi-final stage of the inaugural T20 World Cup in 2007 etched his name in cricket history.

He famously hit bowler Stuart Broad for six consecutive sixes in the 19th over of India's innings. This made him the **first Indian** and only the second player in international cricket (after Herschelle Gibbs in ODIs) to hit six sixes in an over.

Looking at the options provided:

- Virat Kohli
- **Yuvraj Singh**
- Shikhar Dhawan
- Ravindra Jadeja

Yuvraj Singh is the correct answer as he was the first player to achieve this specific feat in the World T20 format.

This performance was a significant moment in the tournament and cemented Yuvraj Singh's reputation as a destructive limited-overs batsman.

75. Answer: b

Explanation:

Understanding the Author of Darbar-i-Akbari

The question asks to identify the writer of the historical work titled **Darbar-i-Akbari**. This book provides detailed accounts and insights into the imperial court of the Mughal Emperor Akbar.

Introduction to Muhammad Hussain Azad

Muhammad Hussain Azad was a pivotal figure in 19th and early 20th-century Urdu literature. Born in Delhi in 1830, he was a renowned poet, essayist, critic, and historian. Azad is particularly celebrated for his role in modernizing Urdu prose and

introducing new literary forms. His contributions significantly shaped the landscape of Urdu writing.

The Work: *Darbar-i-Akbari*

Darbar-i-Akbari stands as one of Muhammad Hussain Azad's significant literary achievements. The book offers a vivid portrayal of Emperor Akbar's court, including its administration, cultural life, and the prominent personalities associated with it. It is valued for its detailed narrative style and historical perspective.

Contextualizing Other Figures

The options provided include other notable historical figures:

- **Amir Khusrau:** A 13th–14th century Sufi musician, poet, and scholar, known for pioneering Urdu poetry and various musical forms.
- **Ziauddin Barani:** A 14th-century historian, known for his work *Tarikh-i-Firuz Shahi*, which chronicles the history of the Delhi Sultanate.
- **Abdul Qadir Badayuni:** A 16th-century historian and translator, known for works like *Muntakhab-ut-Tawarikh*, offering a critical perspective on Akbar's reign.

While these individuals were influential writers and historians of their respective eras, the specific authorship of *Darbar-i-Akbari* is credited to Muhammad Hussain Azad.

Summary of Authorship

Based on literary history, **Muhammad Hussain Azad** is recognized as the author of *Darbar-i-Akbari*, a significant contribution to the understanding of Mughal history and literature.

76. Answer: b

Explanation:

Identifying the Grammatical Error in "coward attack"

The sentence provided is: "It was a horrific and extremely (A)/ coward attack, which (B)/ was totally unprovoked. (C)/ No error (D)". We need to find the segment with a grammatical mistake.

Segment A Analysis: "horrific and extremely"

Segment A includes the adjectives "**horrific**" and the adverb "**extremely**". "Horrific" correctly modifies "attack". "Extremely" functions as an adverb, likely intended to modify the adjective that should follow it (which is missing or misplaced). This segment itself isn't the primary grammatical fault.

Segment B Analysis: "coward attack"

This segment contains the core grammatical error. The word "**coward**" is a noun. Nouns typically refer to people, places, things, or ideas. In this sentence, the word is used before the noun "**attack**" to describe its nature.

When a word modifies a noun, it should be an adjective. The correct adjective form related to "coward" is "**cowardly**". A "cowardly attack" means an attack performed without bravery or courage, often in a sneaky or dishonorable way.

Using the noun "coward" as an adjective here is incorrect. The sentence should read: "...extremely **cowardly** attack...".

Segment C Analysis: "was totally unprovoked"

Segment C contains the verb phrase "**was totally unprovoked**". "**Unprovoked**" is an adjective correctly describing the attack. "**Totally**" is an adverb that correctly modifies the adjective "unprovoked". This segment is grammatically sound.

Segment D Analysis: "No error"

Since a clear grammatical error was identified in segment B, option D ("No error") is incorrect.

Correcting the Grammatical Error

The error lies in the misuse of the noun "coward" where the adjective "cowardly" is required to modify the noun "attack".

The corrected sentence would be: "It was a horrific and extremely **cowardly** attack, which was totally unprovoked."

Therefore, the segment containing the grammatical error is B.

77. Answer: b

Explanation:

Grammar Error Identification: Lufthansa Logo Sale Sentence

The question asks us to identify the part of the given sentence that contains a grammatical error. Let's examine each part of the sentence:

"Lufthansa sells its logo to (A)/ manufacturers of leather jackets, (B)/ luggages and compression socks. (C)/ No error (D)"

Analysis of Sentence Parts

- **Part (A):** "Lufthansa sells its logo to" – This part is grammatically correct. "Lufthansa" is the subject, "sells" is the verb, and "its logo" is the object. The preposition "to" is used correctly here.
- **Part (B):** "manufacturers of leather jackets," – This part is also grammatically correct. It correctly identifies the recipients or types of manufacturers.
- **Part (C):** "luggages and compression socks." – This part contains the error. The word "luggages" is used incorrectly.
- **Part (D):** "No error" – Since an error exists in Part (C), this option is incorrect.

Detailed Explanation of the Error in Part (C)

The error lies in the use of the word "luggages".

- **Uncountable Noun:** In English grammar, the word "luggage" is typically an uncountable (or mass) noun. Uncountable nouns refer to things that cannot be counted as separate units, like 'water', 'information', or 'advice'.
- **Correct Usage:** We usually talk about 'luggage' in a general sense. For example, "The airline has strict limits on **luggage** weight." We don't typically pluralize 'luggage'. If we need to refer to individual items, we use phrases like "pieces of luggage" or "bags".
- **Incorrect Usage:** Using "luggages" as a plural form is generally considered non-standard or incorrect in most contexts when referring to bags or suitcases collectively.
- **Corrected Sentence Fragment:** The correct way to phrase this part would be "...leather jackets, **luggage**, and compression socks." or perhaps "...leather jackets, **luggage items**, and compression socks."

Conclusion

Based on the analysis, the word "luggages" in Part (C) is grammatically incorrect because "luggage" is an uncountable noun. Therefore, Part (C) is the section containing the error.

The correct option identifying the error is C.

78. Answer: a

Explanation:

Error Analysis: The Verb 'Desiring'

The question asks us to identify a grammatical error within the given sentence: "Ravinder is desiring to achieve the goal of going on a world tour with his parents." We need to examine each part of the sentence presented in the options.

Understanding Stative Verbs

In English grammar, verbs can be categorized based on their function. One important category is **stative verbs**. These verbs typically describe a state, condition, feeling, opinion, or sense, rather than an action. They usually express a condition that remains constant.

Common examples of stative verbs include:

- Verbs of emotion/feeling: like, love, hate, want, wish, prefer, desire
- Verbs of cognition/opinion: know, believe, understand, think, remember, realize
- Verbs of possession: have, own, belong
- Verbs related to senses: see, hear, smell, taste, feel

Rule for Continuous Tenses

A key rule regarding stative verbs is that they are generally **not** used in continuous (progressive) tenses (like the present continuous, past continuous, etc.). Instead, they are typically used in their simple tenses.

For instance:

- Incorrect: *I am knowing the answer.*
- Correct: *I know the answer.*
- Incorrect: *She is wanting a new bike.*
- Correct: *She wants a new bike.*

Applying the Rule to the Sentence

The sentence in question uses the verb "desire". "Desire" is a stative verb, indicating a feeling or wish.

The sentence structure is "Ravinder **is desiring** to achieve...". This uses the present continuous tense ("is desiring"). According to the rule for stative verbs, this construction is grammatically incorrect.

The correct way to express this idea using the simple present tense would be:
"Ravinder **desires** to achieve...".

Conclusion on Sentence Error

The phrase "Ravinder is desiring to achieve" contains the grammatical error because the stative verb "desire" is incorrectly used in the continuous tense. Therefore, the first option correctly identifies the part of the sentence with the error.

The sentence should ideally read: "Ravinder desires to achieve the goal of going on a world tour with his parents."

79. Answer: c

Explanation:

Understanding Correlative Conjunctions: Fill in the Blank

This question tests the understanding of correlative conjunctions, which are pairs of conjunctions that work together to join words, phrases, or clauses.

The specific correlative conjunction pair relevant here is '**not only... but also...**'. This pair is used to connect two ideas, clauses, or elements, emphasizing both parts equally.

Let's analyze the sentence structure:

'You must **not only** speak out _____ act against corruption.'

The phrase '**not only**' begins the structure. To complete it correctly, we need the corresponding second part of the correlative conjunction pair.

Analyzing the Options

- Option 1:

but take

– This option does not form the standard correlative pair with 'not only'.

- Option 2:

and also

– While 'also' is present, the structure 'not only... and also...' is grammatically incorrect.

- Option 3:

but also

– This correctly completes the '**not only... but also...**' structure. The sentence becomes: 'You must **not only** speak out **but also** act against corruption.' This means you should both speak out and take action.

- Option 4:

but

– While 'but' can connect clauses, the specific structure 'not only... but...' is less emphatic and common than 'not only... but also...' when connecting two parallel elements like this. 'But also' provides the required parallel structure and emphasis.

- Option 5: Empty option.

Correct Usage Explained

The correct completion uses the standard correlative conjunction '**but also**'. This emphasizes that both speaking out and acting against corruption are necessary actions.

Therefore, the complete and grammatically correct sentence is:

'You must **not only** speak out **but also** act against corruption.'

This structure ensures parallelism and clarity, highlighting the two required actions.

80. Answer: c

Explanation:

This question asks to identify the most suitable phrase to complete the sentence about Priya's suitability for a job. The sentence is: "Priya is not _____ for this kind of a job." We need to choose the phrase that correctly conveys the meaning of being qualified or suited for a particular role.

Completing the Sentence with Idiomatic Phrases

The key to answering this question is understanding common English phrasal verbs and idioms, specifically those related to suitability or qualification.

Understanding the Idiom "Cut Out For"

The phrase "**cut out for**" is an idiom that means someone is naturally suited for a particular job, activity, or role. It implies having the right qualities, skills, or temperament for something.

- Example: He's a natural leader; he's really **cut out for** managing people.
- In the context of the sentence, "Priya is not **cut out for** this kind of a job" means Priya does not possess the necessary qualities or suitability for this specific type of work.

Analyzing Other Options

Let's look at the other options provided:

- "**cut cup**": This phrase does not form a standard English idiom or phrasal verb. It doesn't have a recognized meaning related to suitability for a job or any other context. Therefore, it is grammatically incorrect and nonsensical in this sentence.
- "**cut in**": The phrasal verb "**cut in**" has several meanings, such as interrupting someone, taking someone's turn, or merging into traffic. None of these

meanings fit the context of being suitable or qualified for a job. For example, "Priya is not **cut in** for this kind of a job" would be incorrect.

Choosing the Most Appropriate Phrase

Based on the analysis of the idioms:

- Only "**cut out**", when used in the structure "cut out for," means to be suited or qualified for something.
- The sentence requires a phrase indicating Priya's lack of suitability.
- Therefore, completing the sentence with "**cut out**" results in the grammatically correct and contextually appropriate statement: "Priya is not **cut out** for this kind of a job."

This phrasing effectively communicates that Priya lacks the necessary qualifications or suitability for the job in question.

81. Answer: c

Explanation:

Pilfer Synonym Identification

The question asks to identify the synonym for the word 'Pilfer'. A synonym is a word that means the same or nearly the same as another word. Understanding the meaning of 'Pilfer' is key to finding its correct synonym among the given options.

Understanding the Meaning of 'Pilfer'

'Pilfer' specifically refers to the act of stealing items, usually of small value. It often implies stealing small things frequently or habitually, sometimes from a place where one works or has access.

Analyzing the Options for 'Pilfer'

Let's look at the meaning of each option provided:

- **Abduct:** This means to kidnap someone or take them away illegally by force or deception. It is related to taking someone, not usually an object, and involves force or coercion. This is not a synonym for 'Pilfer'.
- **Deride:** This means to ridicule or mock someone or something, expressing contempt. It involves making fun of someone. This is not related to stealing and is therefore not a synonym for 'Pilfer'.
- **Steal:** This is a general term for taking someone else's property without permission or legal right. While 'Pilfer' is a specific type of stealing (small items, often habitually), 'Steal' is the broader category and fits as a synonym.
- **Berate:** This means to scold someone angrily. It is about verbal reprimand and has nothing to do with taking property. This is not a synonym for 'Pilfer'.

Identifying the Correct Synonym

Comparing the meanings, 'Steal' is the most appropriate synonym for 'Pilfer' because pilfering is a form of stealing. The other options, 'Abduct', 'Deride', and 'Berate', have entirely different meanings unrelated to theft.

82. Answer: d

Explanation:

Understanding the Word Affluent

The question asks us to find the word that best expresses the meaning of "Affluent". To answer this, we need to understand the meaning of "Affluent" and compare it with the meanings of the given alternatives.

Meaning of Affluent

The word "Affluent" is an adjective used to describe someone or something that has a great deal of money. It means wealthy, rich, or prosperous. It often refers to a

person, family, or even a country that is well-off financially.

- Synonyms for Affluent: Wealthy, rich, prosperous, well-to-do, opulent, well-off.
- Antonyms for Affluent: Poor, impoverished, needy, destitute.

For example, "They live in an affluent neighborhood" means they live in a neighborhood where the people living there are generally wealthy.

Analyzing the Alternatives

Let's look at the meanings of the given options:

1. **Impoverished:** This word means reduced to poverty; poor. It is the opposite of wealthy or affluent.
2. **Hostile:** This word means unfriendly or antagonistic. It describes an attitude or environment that is opposed or resistant. This meaning is not related to financial status.
3. **Authentic:** This word means of undisputed origin; genuine. It describes something that is real or true, not fake or copied. This meaning is not related to financial status.
4. **Prosperous:** This word means successful in material terms; flourishing financially. This word directly relates to having financial success and wealth.

Comparing Affluent with the Options

We need to find the word that is closest in meaning to "Affluent".

Word	Meaning	Relation to Affluent (Wealthy/Rich)
Affluent	Wealthy, Rich, having a lot of money	Base word for comparison
Impoverished	Poor, reduced to poverty	Opposite meaning
Hostile	Unfriendly, antagonistic	Unrelated meaning
Authentic	Genuine, real	Unrelated meaning
Prosperous	Successful financially, flourishing	Similar meaning (financially successful/wealthy)

Comparing the meanings, "Impoverished" is an antonym. "Hostile" and "Authentic" have completely different meanings. "Prosperous" means successful financially, which is very close to the meaning of "Affluent" (having a lot of money; wealthy). Therefore, "Prosperous" best expresses the meaning of "Affluent".

Conclusion: Best Meaning for Affluent

Based on the analysis of the word meanings, "Prosperous" is the alternative that best expresses the meaning of "Affluent". Both words describe a state of having financial success and wealth.

Revision Table: Key Vocabulary

Word	Meaning	Part of Speech
Affluent	Wealthy; having a lot of money	Adjective
Impoverished	Poor; reduced to poverty	Adjective
Hostile	Unfriendly; antagonistic	Adjective
Authentic	Genuine; real	Adjective
Prosperous	Financially successful; flourishing	Adjective

Additional Information: Expanding Vocabulary

Understanding synonyms and antonyms is crucial for improving vocabulary and comprehension. When learning a new word like "Affluent," it's helpful to associate it with similar words (synonyms) and opposite words (antonyms). This helps in retaining the meaning and using the word correctly in different contexts.

- Synonyms are words that have similar meanings (e.g., big, large).
- Antonyms are words that have opposite meanings (e.g., big, small).

In competitive exams, questions often test your ability to identify the closest synonym or antonym of a given word. Practicing with various words and their related terms can significantly boost performance.

83. Answer: b

Explanation:

Cajole means to persuade someone through coaxing or flattery. Among the options, **Entice** — to attract or tempt by offering pleasure or advantage — shares the same core idea of winning someone over by gentle persuasion. *Disenchant* and *repulse* are antonyms; *bully* implies coercion, not coaxing.

84. Answer: c

Explanation:

Understanding the Meaning of FLIMSY

The question asks us to find the word that best matches the meaning of the given word, **FLIMSY**. Let's break down the meaning of **FLIMSY** and look at the options

provided.

Meaning of FLIMSY

The word **FLIMSY** typically describes something that is:

- Light and not strong.
- Easily damaged, broken, or destroyed.
- Lacking solidity, substance, or conviction (e.g., a flimsy argument, a flimsy excuse).

Essentially, it points to a lack of strength or substance.

Analyzing the Options for FLIMSY

We need to examine each option to see which one is the closest synonym for **FLIMSY**.

- **Option 1: Funny**

Meaning: Causing laughter or amusement; humorous.

Comparison: While some flimsy situations might incidentally be amusing, the core meaning of **funny** (humorous) is very different from the core meaning of **flimsy** (weak, easily broken).

- **Option 2: Irrational**

Meaning: Not logical or reasonable.

Comparison: An argument or excuse described as **flimsy** might also be **irrational**, but **flimsy** specifically highlights its lack of strength or evidence, whereas **irrational** focuses on the lack of logic. They aren't the same.

- **Option 3: Fragile**

Meaning: Easily broken or damaged; delicate.

Comparison: This meaning is very similar to **FLIMSY**, especially when referring to physical objects. Something that is **fragile** lacks robustness and can be easily

damaged, just like something described as **flimsy**.

- Option 4: Partisan

Meaning: Relating to or showing strong support for one party, cause, or group, especially in politics; prejudiced.

Comparison: The meaning of **partisan** (showing strong bias or loyalty) is completely unrelated to the meaning of **flimsy**.

Conclusion: Best Expression of FLIMSY

Based on the analysis, the word **Fragile** shares the most significant overlap in meaning with **FLIMSY**, as both relate to being weak and easily broken or damaged.

85. Answer: b

Explanation:

Antonym for 'Exonerate' Explained

This question requires us to find the word that has the opposite meaning (an antonym) to the given word, **Exonerate**. We need to carefully examine the meaning of **Exonerate** and each of the options provided.

Understanding the Word 'Exonerate'

The word **Exonerate** means to clear someone of blame or suspicion, or to relieve them from a duty or obligation. Essentially, it means to declare someone free from guilt or wrongdoing.

Here are some words that have a similar meaning to **Exonerate** (synonyms):

- Acquit
- Absolve
- Vindicate

- Clear
- Pardon

Analyzing the Provided Options

Let's look at each option to determine which one is the best opposite of **Exonerate**:

Option 1: '*Acquit*'

Acquit means to free someone from a criminal charge by finding them not guilty. This is very similar in meaning to **Exonerate**, making it a synonym, not an antonym.

Option 2: '*Accused*'

Accused refers to a person or people who have been formally charged with or identified as guilty of a crime or offense. Being **Accused** means being blamed or facing charges. This is the direct opposite of being cleared or freed from blame (Exonerated). Therefore, **Accused** is a strong candidate for the antonym.

Option 3: '*Pardon*'

Pardon means to forgive or to remit (cancel) the punishment for an offense. Like **Acquit**, this word is related to freeing someone from consequences, making it a synonym or closely related term to **Exonerate**.

Option 4: '*Liberate*'

Liberate means to set someone free from confinement or restriction, such as freeing someone from prison. While it means freedom, it is not the opposite of being cleared from blame in the specific sense that **Exonerate** implies.

Final Answer: The Correct Antonym

To summarize, **Exonerate** means to be freed from blame. The opposite state is to be blamed or formally charged. Out of the given options, **Accused** best represents this opposite meaning. It describes the state of facing charges, which is the contrary of being cleared by exoneration.

Thus, the correct antonym for **Exonerate** among the choices is **Accused**.

86. Answer: b

Explanation:

Understanding the Opposite Meaning of Mitigate

This question requires us to find the word that has the exact **opposite meaning** to 'Mitigate'. This involves understanding the core meaning of 'Mitigate' and then comparing it with the meanings of the given options to find the best antonym.

Defining the Word Mitigate

The verb 'Mitigate' means to make something less severe, painful, or serious. It implies reducing the negative effects or intensity of something undesirable.

For example: We can take steps to **mitigate** the impact of climate change.

Analyzing the Options Provided

Let's examine the meaning of each option to see how it relates to 'Mitigate':

- **Appease**: This means to pacify or make someone less angry or hostile, or to reduce the intensity of something unpleasant.
- **Enhance**: This means to intensify, increase, or further improve the quality, value, or extent of something.
- **Allay**: Similar to 'mitigate', this means to calm or pacify fears, suspicions, or worries, or to make something less severe.
- **Reduce**: This means to make something smaller or less in amount, degree, or size.

Comparing Meanings to Find the Antonym

We need the word that is the **opposite** of making something less severe. Let's see which option fits:

- 'Appease', 'Allay', and 'Reduce' all describe actions that lessen or decrease something, similar to '**Mitigate**'. They are related in meaning or are synonyms.
- '**Enhance**' describes an action that increases or intensifies something. This is the opposite of making something less severe.

Here's a summary table:

Option	Meaning	Relationship to 'Mitigate'
Appease	To make less intense; pacify.	Similar (reduces intensity)
Enhance	To increase or intensify.	Opposite (increases intensity)
Allay	To make less severe; calm.	Similar (reduces severity)
Reduce	To make smaller or less.	Similar (makes less)

Conclusion: Identifying the Best Opposite Meaning

Based on the analysis, '**Mitigate**' means to lessen severity. The word '**Enhance**' means to increase or intensify. Therefore, '**Enhance**' is the word that best expresses the **opposite meaning** among the choices.

87. Answer: c

Explanation:

Analyzing the Opposite Meaning of Condense

The primary goal here is to identify the word that has the opposite meaning (an antonym) to the given word, which is **Condense**. We need to understand the

meaning of **Condense** and compare it with the meanings of the provided options: Chop, Curtail, Expand, and Trim.

Solution: Finding the Antonym for Condense

Let's break down the meaning of the target word and the options:

Understanding the Word: Condense

The word **Condense** generally means to make something more dense, compact, or shorter. For example, you can condense a long story into a summary, or water vapor can condense into liquid.

Examining the Options:

- **Chop:** This means to cut something, typically into pieces, using an axe or knife. It doesn't relate to making something larger or less compact.
- **Curtail:** This means to reduce or limit something. While it involves making something smaller in scope or extent, it's not the direct opposite of making something more compact or dense.
- **Expand:** This means to become or make larger or more extensive. This is the direct opposite of making something more compact or dense.
- **Trim:** This means to cut off irregular or unwanted parts from something, often to make it neater or smaller. Like 'chop', it implies cutting, not increasing size or density.

Identifying the Opposite Meaning:

Comparing the meanings, we can see that:

- **Condense** means to make smaller or more compact.
- **Expand** means to make larger or less compact.

Therefore, **Expand** is the word that is opposite in meaning to **Condense**.

The correct option is the one that means making something larger or more extensive, which is **Expand**.

88. Answer: c

Explanation:

LUSCIOUS Meaning Explained

The word **LUSCIOUS** describes something that is very pleasing, especially to the senses of taste and smell. It often implies richness, sweetness, juiciness, and attractiveness. For example, a ripe mango might be described as luscious because of its sweet taste and appealing texture.

Finding the Opposite Meaning: Option Analysis

The question asks for the word that is most nearly **opposite in meaning** to LUSCIOUS. Let's examine each option:

- **Attractive:** This word relates primarily to appearance and how pleasing something is visually. While something luscious might also be attractive, "attractive" is not the direct opposite of "luscious" concerning taste or smell.
- **Tasty:** This word means having a pleasant flavor. "Tasty" is very similar to "luscious" in the context of food and drink, making it a synonym rather than an antonym.
- **Tasteless:** This word means lacking flavor or having no pleasing taste. If something lacks the rich, pleasant qualities implied by "luscious," then "tasteless" is a direct opposite in terms of flavor.
- **Succulent:** This word describes something, particularly food, as being juicy, tender, and enjoyable to eat. Like "tasty," "succulent" is closely related to "luscious" and is considered a synonym, focusing on juiciness and pleasantness.

Correct Antonym Identification

Based on the analysis, the word that best represents the opposite meaning of LUSCIOUS is "Tasteless".

- "Luscious" indicates a highly pleasant and often rich taste.
- "Tasteless" indicates a lack of taste or a failure to provide any pleasant flavor.

The other options, "Attractive" (related to appearance) and "Tasty" and "Succulent" (synonyms related to pleasant taste/juiciness), do not serve as opposites.

89. Answer: c

Explanation:

Identifying the Adjective Form of 'Bother'

The question asks for the correct adjective form of the word 'Bother'. An adjective is a word used to describe a noun or pronoun, providing more information about its qualities or characteristics. Let's examine the provided options to find the word that functions as an adjective for 'Bother'.

Understanding Word Forms: 'Bother'

'Bother' itself can be used as a verb (meaning to trouble or annoy) or a noun (meaning trouble or annoyance). We need to find the related word that describes something or someone as causing bother.

Analysis of Options

- **Option 1: Bothering**

The word 'Bothering' is the present participle of the verb 'bother'. While participles can sometimes function as adjectives (e.g., "a *bothering* noise"), it's not the standard, distinct adjective form of the word.

- **Option 2: Bothersomeness**

'Bothersomeness' is a noun. It refers to the quality or state of being bothersome.

- Option 3: Bothersome

'Bothersome' is an adjective. It means causing trouble, annoyance, or worry. For example, "Dealing with the paperwork was *bothersome*." This fits the requirement of an adjective describing a quality.

- Option 4: Botheration

'Botheration' is a noun. It refers to a state of being bothered, annoyance, or something that causes trouble.

Conclusion on the Adjective Form

Based on the analysis, 'Bothersome' is the correct adjective form derived from 'Bother', used to describe someone or something that causes trouble or annoyance.

90. Answer: b

Explanation:

Identifying the Noun Form of Assist

This question asks us to identify the correct noun form of the verb 'assist'. Understanding different word forms, such as verbs, nouns, adjectives, and adverbs, is crucial for building vocabulary and improving language skills. Verbs often describe actions or states of being, while nouns represent people, places, things, or ideas.

Understanding Word Forms

The word 'assist' is a verb, meaning to help someone, typically by doing a share of the work or providing support.

- Verb: assist (e.g., "He will **assist** you.")

We need to find the corresponding noun, which represents the act or concept of helping.

Analyzing the Options

Let's examine each option provided:

- **Option 1: Assisted** – This is the past tense or past participle form of the verb 'assist'. It describes an action that happened in the past. (e.g., "She **assisted** the patient.") It is not a noun.
- **Option 2: Assistance** – This word refers to the act of helping or the support given. It functions as a noun. (e.g., "Thank you for your **assistance**.")
- **Option 3: Assisting** – This is the present participle or gerund form of the verb 'assist'. It can be used in continuous tenses or as a noun referring to the act of helping. (e.g., "He is **assisting** the doctor." or "**Assisting** others is rewarding.") While it can function as a noun (gerund), 'Assistance' is the primary and most direct noun form representing the concept.
- **Option 4: Assessment** – This word means the evaluation or estimation of the nature, ability, or quality of something. It is the noun form of the verb 'assess', not 'assist'. (e.g., "The **assessment** will take place tomorrow.")

Determining the Most Appropriate Noun

Comparing the options, 'Assistance' directly represents the noun form of the verb 'assist', signifying the concept or act of helping.

Conclusion

Therefore, the most appropriate noun form of the verb 'assist' among the choices given is 'Assistance'.

Verb Form	Noun Form	Example Sentence (Noun)
assist	Assistance	We need assistance with this project.

The correct choice fills the blank appropriately, signifying the concept of help.

91. Answer: d

Explanation:

Understanding the Phrase: 'Having no hair on the scalp'

The phrase 'Having no hair on the scalp' clearly describes the condition of lacking hair on a person's head.

Analyzing Options for Phrase Substitution

The task is to find the single word from the given choices that serves as the best substitute for the descriptive phrase 'Having no hair on the scalp'. Let's look at each option:

Option 1: Babble Definition

Babble means to talk rapidly and unintelligibly, often like a baby, or the sound made by a stream.

This word relates to speech or sound and does not fit the meaning of lacking hair.

Option 2: Bogus Definition

Bogus means false, fake, or not genuine.

This word is used to describe something that is deceitful or counterfeit, which is unrelated to the absence of hair.

Option 3: Boggle Definition

Boggle means to be surprised or overwhelmed by something, or to hesitate because of doubt or fear.

This word describes a reaction or feeling and is not related to a physical characteristic like hair loss.

Option 4: Bald Definition and Relevance

Bald is an adjective specifically used to describe a person or animal that has lost or never had hair on its head.

The meaning of 'bald' directly corresponds to the definition provided in the phrase 'Having no hair on the scalp'.

Selecting the Best Substitute Word

Based on the analysis of the definitions, the word **Bald** is the most accurate and fitting substitute for the phrase 'Having no hair on the scalp'.

92. Answer: b

Explanation:

Matching Word Meanings: Hand and Face Actions

The question asks us to find a single word that accurately defines "A movement or action of the hands or face". This phrase describes non-verbal communication or expression using specific body parts.

Analyzing the Options

Let's examine each option to see which one best fits the definition:

- **Action:** An action is generally defined as 'the process of doing something'. While a movement of the hands or face is a type of action, the word 'action' itself is very broad and doesn't specifically refer to movements of the hands or face meant to convey meaning.

- **Gesture:** A gesture is defined as 'a movement of part of the body, especially a hand or the head, to express an idea or meaning'. This definition directly corresponds to the description provided in the question, focusing on movements of the hands and face to communicate something.
- **Anima:** Anima refers to the unconscious feminine side of a male personality in Jungian psychology, or more generally, life or soul. This word is completely unrelated to physical movements of the hands or face.
- **Posture:** Posture refers to the way in which a person holds their body or holds themselves, specifically referring to the position of the body. While posture involves body positioning, it doesn't specifically mean a movement of the hands or face to express meaning.

Identifying the Correct Term

Comparing the definitions, the word **Gesture** is the most precise match for "A *movement or action of the hands or face*", as it specifically relates to expressing meaning through such movements.

93. Answer: d

Explanation:

Understanding the Idiom: "Fly off the handle"

The question asks us to identify the correct meaning of the English idiom "Fly off the handle". Idioms are phrases where the words together have a meaning that is different from the dictionary definitions of the individual words. Understanding these can sometimes be tricky!

Meaning of "Fly off the handle"

The idiom "Fly off the handle" means to suddenly lose your temper or become very angry, often unexpectedly. Imagine a tool, like an axe, where the head suddenly detaches ('flies off') from the handle – it's a sudden, uncontrolled reaction.

Analyzing the Options

Let's look at each option to see which one matches the meaning of "Fly off the handle":

- **Option 1: To dive into the pool** – This describes a physical action of entering water, which has no relation to the idiom's meaning.
- **Option 2: To jump from a building** – This is also a physical action, indicating a leap, and is unrelated to losing one's temper.
- **Option 3: To fly a plane** – This option plays on the word "fly" but refers to piloting an aircraft. It does not relate to the idiom's figurative meaning.
- **Option 4: Become angry** – This option accurately reflects the meaning of "Fly off the handle". It describes the sudden loss of temper that the idiom represents.
- Option 5 was not provided with text content for analysis.

Conclusion

Based on the analysis, the phrase "Fly off the handle" is used to describe someone who becomes uncontrollably angry. Therefore, the option that best expresses this meaning is "Become angry".

94. Answer: a

Explanation:

Understanding the Idiom: Not to Mince Matters

The idiom "Not to mince matters" is a common phrase in English. It describes a particular way of speaking. When someone uses this idiom, they are referring to being direct and frank in their communication.

Meaning of Not to Mince Matters

To "not mince matters" means to speak plainly and directly, especially about something difficult or unpleasant. It implies speaking the truth without trying to

soften the impact or avoid causing offense. It's about being straightforward and unreserved in what you say.

Analyzing the Options for Not to Mince Matters

Let's look at the given options and see which one best expresses the meaning of the idiom "Not to mince matters".

1. **To speak unreservedly:** The word "unreservedly" means without reservation or hesitation; frankly or openly. This aligns directly with the idea of speaking directly and not holding back, which is the core meaning of "Not to mince matters".
2. **To place full reliance upon:** This means to trust someone or something completely. This meaning has no relation to the act of speaking or the directness of communication described by the idiom.
3. **To doubt the matters at hand:** This refers to having uncertainty or questioning the current situation or topic. This is unrelated to the idiom, which is about the manner of speaking, not about doubt.
4. **To procrastinate:** This means to delay or postpone action. This is a verb describing an action, not a description of how someone speaks, and therefore is not related to the idiom "Not to mince matters".

Based on the analysis, the option that best expresses the meaning of "Not to mince matters" is "To speak unreservedly" because both phrases convey the idea of speaking frankly and directly without holding anything back.

Meaning of Not to Mince Matters Explained

When you hear or use the phrase "Not to mince matters," remember it means speaking clearly and directly, often about topics that might be uncomfortable or sensitive. It's the opposite of beating around the bush or sugarcoating the truth.

Revision Table: Idioms and Meanings

Here is a summary of the idiom and its meaning:

Idiom/Phrase	Meaning
Not to mince matters	To speak directly and frankly; to speak unreservedly

Understanding idioms like "Not to mince matters" is important for improving your English vocabulary and comprehension. Idioms are phrases where the meaning is not obvious from the individual words.

Additional Information: Common English Idioms

English is rich in idioms, making communication more colorful but sometimes tricky to understand. Here are a few other common idioms:

- **Break a leg:** Good luck (especially before a performance).
- **Hit the nail on the head:** To describe exactly what is causing a situation or problem.
- **Bite the bullet:** To face a difficult or unpleasant situation with courage.
- **Let the cat out of the bag:** To reveal a secret by mistake.

Learning idioms helps you understand native speakers better and makes your own English sound more natural. "Not to mince matters" is just one example of how unique phrases convey specific meanings in English.

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95. Answer: c

Explanation:

Choosing the Right Word for Blank (1): Environment and Human Existence

This question requires us to select the most suitable word to fill the blank labelled (1) in the provided passage. The passage emphasizes the crucial role of the **environment** in relation to human life.

The specific sentence is: "**Environment** is the foundation and _____(1)_____ of human existence and survival..." We need a word that complements "foundation" and describes the supportive role the environment plays for humans.

Analyzing the Options for Blank (1)

Let's examine each option in the context of the sentence:

- **Restrain:** This word means to hold back or keep under control. It doesn't fit the context because the environment doesn't primarily hold back human existence; it enables it.
- **Impede:** This means to hinder or obstruct. Similar to 'restrain', this word has a negative connotation and is the opposite of what is needed to describe the environment's role in human survival.
- **Support:** This word means to bear all or part of the weight of; hold up; give assistance or strength to. This aligns perfectly with the idea that the environment serves as a basis (foundation) and provides the necessary resources and conditions (support) for human existence and survival.
- **Blight:** This means to spoil or damage something, especially by ruining its appearance. This is a negative term and is unsuitable for describing the essential role of the environment.

Contextual Fit and Final Choice

The passage highlights the environment as both the "foundation" and a provider for human existence. The word "**Support**" effectively conveys this meaning, suggesting that the environment upholds and sustains human life, much like a foundation does. The sentence aims to express the indispensable and beneficial relationship between humans and their environment, making "support" the most logical and contextually appropriate choice.

Therefore, the completed sentence reads: "**Environment** is the foundation and **support** of human existence and survival..."

Option	Meaning	Fit with Context
Restrain	To hold back	Poor fit
Impede	To hinder	Poor fit
Support	To uphold, assist	Excellent fit
Blight	To spoil or damage	Poor fit

96. Answer: a

Explanation:

Choosing the Right Word for Blank (2) in the Environment Passage

This solution explains how to correctly fill in the blank labelled (2) in the provided passage about the environment and human existence. The passage discusses the relationship between human development, society, and the environment.

Understanding the Sentence Context

Let's focus on the sentence containing the blank: "Now humankind is striving _____(2)_____ the historical process of postindustrial society and is trying to reach _____(3)_____ with the environment in the later stage of development."

We need to find the word that best fits blank (2), describing humankind's action related to the "historical process of postindustrial society". This process is presented as a stage or direction in human development.

Analyzing the Options for Blank (2)

We are given four options for blank (2): 'towards', 'for', 'into', and 'at'. Let's examine how each fits:

- **'towards'**: When used with 'striving', 'towards' indicates movement in a particular direction or progress toward a goal or stage. "Striving towards the historical process of postindustrial society" suggests moving forward into this new societal phase. This aligns well with the idea of societal development.
- **'for'**: 'Striving for' means trying hard to achieve or obtain something. While humankind might aim for the benefits of postindustrial society, the phrase "striving for the historical process" sounds less natural than progressing **towards** it as an era.
- **'into'**: 'Striving into' would suggest entering forcefully or actively engaging within the process. While possible, 'towards' often better captures the sense of progression towards a future stage.
- **'at'**: 'Striving at' is less common in this context. It might imply focusing effort on a specific point within the process, but it doesn't convey the broad sense of moving through a historical stage as effectively as 'towards'.

Selecting the Most Appropriate Word

Considering the context of moving through a "historical process" and aiming for a "later stage of development", the word 'towards' best describes the direction of human effort.

Humankind is generally progressing or moving in the direction of this significant shift in society, making 'towards' the most suitable choice.

Conclusion for Blank (2)

The word that most appropriately fits blank (2) is **towards**, as it signifies the progression and direction of humankind in relation to the development of postindustrial society.

Explanation:

This question requires selecting the most appropriate word to fill in the blank labelled (3) in the provided passage about the relationship between human existence, development, and the environment.

Analyzing the Role of Blank (3) in Environmental Context

The passage discusses the environment as fundamental to human existence and the pursuit of sustainable development. The specific sentence containing the blank is: "Now humankind is striving _____(2)_____ the historical process of postindustrial society and is trying to reach _____(3)_____ with the environment in the later stage of development." This highlights the goal humanity aims to achieve concerning the environment after progressing through societal changes.

Evaluating Options for Blank (3)

Let's examine each option to see which word best fits the context of reaching a specific state or relationship with the environment:

- **Disparity:** This means a significant difference or inequality. Reaching a 'disparity with the environment' suggests an unbalanced or unequal relationship, which is generally seen as negative and not a desirable goal for sustainable development.
- **Straight:** This word typically refers to a direct path or honesty. It doesn't logically fit into the context of a relationship or state of being concerning the environment.
- **Asymmetry:** Similar to disparity, asymmetry implies a lack of balance or proportion. While sometimes applicable in ecological contexts, achieving 'asymmetry' isn't the typical goal described in sustainable development, which often emphasizes harmony and balance.
- **Rebalance:** This means to restore something to a state of balance. In the context of human development and its impact on the environment, striving to 'rebalance' the relationship suggests working towards equilibrium and

sustainability, which aligns well with the goals of post-industrial societies focused on long-term well-being and environmental health.

Determining the Best Fit for Sustainable Development

The passage speaks of the 'later stage of development' and implies a positive or corrective action towards the environment. Humanity has often caused imbalances through industrialization. Therefore, aiming to achieve a state of **rebalance** with the environment is a logical and common objective in discussions about sustainability and future development strategies. It signifies a move towards harmony and mutual coexistence after periods of potentially detrimental interaction.

Considering the options, **Rebalance** is the most fitting word to complete the sentence, reflecting the goal of restoring equilibrium in the human-environment relationship during advanced stages of societal development.

98. Answer: a

Explanation:

Understanding India's Historical Narrative in the Passage

This solution provides a detailed explanation of the provided passage and the multiple-choice question asked. We will analyze the passage to understand its main themes and evaluate each option to determine the most fitting answer.

Passage Analysis: Key Themes

The passage highlights several aspects of India's historical interactions with the outside world:

- **Inspiration for the World:** India is portrayed as a source of inspiration due to its significant material wealth, economic prosperity, and spiritual depth.

- **Attraction for Foreigners:** Various groups, including traders, invaders, preachers, and spiritual seekers, were drawn to India.
- **Journey Challenges:** The passage emphasizes the long and arduous land journeys undertaken by these travelers, noting the physical and mental strain it caused, exemplified by Alexander's troops' refusal to proceed further.
- **Integration and Enrichment:** Despite the challenges, many groups like the Kashas, Huns, Sakes, Turks, and Mughals chose to settle in India. They integrated into Indian life and contributed significantly to its culture, heritage, and traditions, adding to its overall glory.

Question Focus: What the Passage Emphasizes

The question asks what the passage "speaks volubly of," meaning what central theme or topic it discusses most extensively or enthusiastically. We need to find the option that best summarizes the core message conveyed by the text.

Evaluating the Options

Option 1: India's past glory

This option suggests the passage focuses on the historical magnificence of India. The text mentions India's "fabulous wealth," "spiritual excellence," and how various groups enriched its "culture, heritage and tradition," adding "lustre to her glory." This suggests a focus on India's esteemed historical standing and the factors contributing to it. This theme encompasses the material, spiritual, and cultural aspects discussed.

Option 2: Invaders who attacked India

The passage does mention invaders like Alexander's troops, Kashas, Huns, Sakes, Turks, and Mughals. However, it doesn't solely focus on their invasions or attacks. It also discusses traders, preachers, and seekers, and crucially, the assimilation and contribution of these groups to India's culture. Therefore, focusing only on 'invaders' is too narrow.

Option 3: India's fabulous wealth

India's "fabulous wealth" and "economic prosperity" are mentioned as key reasons for its inspirational status. However, the passage also gives equal weight to "spiritual excellence" and the cultural enrichment brought by settlers. Focusing only on wealth neglects these other significant aspects.

Option 4: India as a home for foreigners

The passage states that many ancient and medieval tribes "chose to make this land their own home." While this is mentioned, it's presented as a consequence of the initial attraction (wealth, spirituality) and the journey. The passage talks more broadly about the interactions and the resulting contributions to India's overall historical standing rather than just its role as a destination for settlement.

Conclusion: Synthesizing the Passage's Message

Considering the analysis, the passage discusses India's historical allure stemming from its wealth and spirituality, the challenges faced by those coming to India, and the positive contributions of various groups who settled there, ultimately enhancing India's reputation and heritage. The most comprehensive theme that captures these elements is **India's past glory**, as it encompasses its material richness, spiritual significance, and the cultural contributions that added to its historical magnificence.

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99. Answer: c

Explanation:

Passage Analysis: India's Historical Attractions

This question requires us to carefully examine the provided passage to understand what aspects of India historically drew visitors like traders, invaders, and preachers.

Identifying Key Attractions Mentioned

The passage highlights that India has always been a source of inspiration globally due to its distinct qualities. It explicitly states:

- India possessed "fabulous wealth, both material and economic prosperity".
- India also offered "spiritual excellence".

These factors, according to the text, were responsible for attracting various groups of people to India. The passage mentions that these visitors included "traders and invaders" as well as "preachers and seekers".

Analyzing Visitor Motivations

The passage further clarifies the specific purpose of some visitors:

- **Traders and invaders** were drawn by India's material and economic prosperity.
- **Preachers and seekers**, specifically, came "in search of truth and salvation".

The question asks what attracted traders, invaders, *and* preachers. We need to find the option that best represents the motivations described in the passage for these groups.

Evaluating the Options

- **Option 1: Its material and social prosperity** – While the passage mentions material and economic prosperity, it does not explicitly mention "social prosperity" as an attraction.
- **Option 2: Its material and spiritual wealth** – This option aligns well with the passage stating India's "fabulous wealth, both material and economic prosperity" and "spiritual excellence". This covers the attractions for traders, invaders, and the spiritual aspect for preachers and seekers.
- **Option 3: The knowledge of truth and salvation** – The passage directly states that preachers and seekers came specifically "in search of truth and salvation". This option precisely captures the stated motivation for preachers.
- **Option 4: Its fabulous wealth and glory.** – The passage mentions "fabulous wealth", but "glory" is mentioned in the context of invaders adding luster to India's glory, not as a primary attraction for all visitors mentioned.

Determining the Best Fit

The passage mentions multiple attractions contributing to India's appeal. It states that India's "fabulous wealth, both material and economic prosperity" and "spiritual excellence" drew people. It then specifically links "preachers and seekers" to the quest for "truth and salvation". Option 3 directly reflects this specific purpose articulated for preachers in the passage. While Option 2 encompasses broader attractions mentioned (material and spiritual wealth), Option 3 focuses on the explicit goal stated for preachers.

100. Answer: c

Explanation:

Alexander's Return Cause Explained

This solution explains why Alexander was forced to move back to his country, based on the provided passage about India's historical interactions with the world.

Passage Context on Alexander's Journey

The passage highlights that India's prosperity attracted many people, including traders, invaders, preachers, and seekers. These individuals often undertook long and difficult journeys via land routes. The text specifically mentions an instance involving Alexander's troops:

- "Thus, the troops of Alexander mutinied and refused to march beyond Bees because of their weariness and fatigue in fighting and homesickness."
- "They had, therefore, to be perforce dispatched hack."

This directly addresses the situation that led to Alexander's withdrawal.

Analysis of Options for Alexander's Retreat

Let's examine each option in light of the passage:

- **Option 1: The resistance of the natives**

The passage does not state that resistance from local people was the reason Alexander's troops refused to continue marching. While conflicts might have occurred, the text explicitly gives different reasons.

- **Option 2: The revolt of his army men.**

The passage does mention that Alexander's troops "mutinied," which is a form of revolt. However, this option doesn't specify the underlying cause of the mutiny, which is crucial information provided in the passage.

- **Option 3: Weariness and homesickness in his troops**

This option accurately reflects the reasons stated in the passage. The text clearly says the troops refused to march further due to their "weariness and fatigue in fighting and homesickness." This directly led to their return.

- **Option 4: Lack of fighting spirit in his people.**

The passage attributes the troops' refusal to continue to specific conditions like weariness and homesickness, not a general lack of fighting spirit. They were tired from fighting and missed their homes, which is different from lacking the will to fight altogether.

Conclusion on Alexander's Withdrawal

Based on the direct information provided in the passage, the primary factors forcing Alexander to turn back were the extreme weariness and fatigue his troops experienced from prolonged fighting, coupled with their deep feelings of homesickness. These conditions caused his army to mutiny, compelling him to send them back.