CUET PG 2025 General Management Question Paper with Solutions

Time Allowed :1 Hour 30 Mins	**Maximum Marks :**300	**Total Questions :**75

General Instructions

Read the following instructions very carefully and strictly follow them:

1. The examination duration is 90 minutes. Manage your time effectively to attempt all questions within this period.
2. The total marks for this examination are 300. Aim to maximize your score by strategically answering each question.
3. There are 75 mandatory questions to be attempted in the Atmospheric Science paper. Ensure that all questions are answered.
4. Questions may appear in a shuffled order. Do not assume a fixed sequence and focus on each question as you proceed.
5. The marking of answers will be displayed as you answer. Use this feature to monitor your performance and adjust your strategy as needed.
6. You may mark questions for review and edit your answers later. Make sure to allocate time for reviewing marked questions before final submission.
7. Be aware of the detailed section and sub-section guidelines provided in the exam. Understanding these will aid in effectively navigating the exam.

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1. Choose the correct alternative for the underlined portion:

Each village in the state is provided by electricity supply.

(A) provided in
(B) provided for
(C) provided with
(D) provided

Correct Answer: (C) provided with

Solution:

Step 1: Understanding the Concept:
This question tests the correct usage of prepositions with the verb 'provide'. The choice of preposition depends on the structure of the sentence.

Step 2: Detailed Explanation:
The standard grammatical structure for the verb 'provide' is:
Structure 1: provide something for someone/something.
Example: The state provides electricity **for** each village.

Structure 2: provide someone/something with something.
Example: The state provides each village **with** electricity.

In the given sentence, the structure is passive. The object of the action (each village) becomes the subject. The sentence follows Structure 2 in its passive form:
Passive form: Each village is provided **with** electricity by the state.

Let's analyze the options:

- (A) provided in: Incorrect preposition. 'In' usually denotes location.
- (B) provided for: This would be correct if the sentence was restructured, e.g., "Electricity supply is provided for each village". But it doesn't fit the current structure.
- (C) provided with: This is the correct preposition for the given passive structure, where the recipient is followed by the thing that is supplied.
- (D) provided: This is grammatically incomplete as it lacks the necessary preposition to connect to "electricity supply".

Therefore, the correct phrase is "provided with".

Step 3: Final Answer:
The sentence correctly reads: "Each village in the state is **provided with** electricity supply."
This makes option (C) the correct choice.

Quick Tip

Remember common verb-preposition collocations. For 'provide', the two main patterns are 'provide something for someone' and 'provide someone with something'. Understanding the active and passive forms of these structures is key to solving such questions.

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2. Choose the correct alternative for the underlined portion:

Nothing please her more than reading books and magazines.

(A) please
(B) have pleased
(C) pleases
(D) are pleasing

Correct Answer: (C) pleases

Solution:

Step 1: Understanding the Concept:
This question tests subject-verb agreement. The verb in a sentence must agree in number (singular or plural) with its subject.

Step 2: Detailed Explanation:
Identifying the Subject: The subject of the sentence is "Nothing".

Subject Number: Indefinite pronouns like 'nothing', 'something', 'anything', 'everyone', 'nobody', and 'someone' are always treated as singular subjects.

Verb Agreement: A singular subject requires a singular verb. In the simple present tense, a singular verb for a third-person subject (like 'nothing') is formed by adding '-s' or '-es' to the base form of the verb.

Let's analyze the options:

- (A) please: This is the plural form of the verb. It would be correct for subjects like 'they' or 'you'. (e.g., "They please her.")
- (B) have pleased: This is a plural present perfect form. The singular form is 'has pleased'.
- (C) pleases: This is the third-person singular present tense form of the verb, which correctly agrees with the singular subject "Nothing".
- (D) are pleasing: 'Are' is a plural verb. The singular form is 'is pleasing'.

Therefore, the singular verb "pleases" is the correct choice to agree with the singular subject "Nothing".

Step 3: Final Answer:
The sentence should be: "Nothing **pleases** her more than reading books and magazines." Thus, option (C) is correct.

> Quick Tip
>
> When dealing with subject-verb agreement, first identify the subject of the sentence. Be careful with indefinite pronouns (like nothing, everyone), as they are always singular and require a singular verb.

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3. Which one of the following best improves the underlined phrase?

Deactivated viruses form the basis of many vaccines known for their effectiveness to prevent diseases.

(A) to prevent
(B) in preventing
(C) with preventing
(D) preventing

Correct Answer: (B) in preventing

Solution:

Step 1: Understanding the Concept:
This question tests the correct grammatical structure following the noun "effectiveness". It involves choosing the right preposition and verb form (gerund vs. infinitive).

Step 2: Detailed Explanation:
The noun "effectiveness" is typically followed by the preposition "in" and a gerund (the -ing form of a verb) to describe the area or action where something is effective.
The correct idiomatic expression is "effectiveness in doing something".

Let's examine the options:

- (A) to prevent: This is an infinitive. While "ability to prevent" is correct, "effectiveness to prevent" is not standard English. The structure "effectiveness in..." is preferred.
- (B) in preventing: This follows the correct grammatical pattern: noun (effectiveness) + preposition (in) + gerund (preventing). This is the most appropriate and idiomatic choice.
- (C) with preventing: The preposition 'with' is incorrect in this context.
- (D) preventing: Using the gerund directly without the preposition 'in' makes the phrase grammatically awkward and incomplete.

Therefore, "effectiveness in preventing diseases" is the grammatically correct and most natural-sounding phrase.

Step 3: Final Answer:
The improved sentence is: "Deactivated viruses form the basis of many vaccines known for their effectiveness **in preventing** diseases." Option (B) is the correct choice.

Quick Tip

Pay close attention to noun-preposition collocations. Words like 'effectiveness', 'success', 'difficulty', and 'interest' are often followed by the preposition 'in' and a gerund. Making a list of such common pairings can be very helpful for exams.

4. Which one of the following best improves the underlined portion?

However, wood sculptures are vulnerable to decay, insect damage and fire. As a result, they hang around far less often than sculptuers made of more durable materials.

(A) dry out
(B) hang around
(C) survive
(D) stay on

Correct Answer: (C) survive

Solution:

Step 1: Understanding the Concept:
This question requires choosing the most appropriate word based on the context of the sentence. The goal is to select a word that fits the formal tone and meaning established by the surrounding text.

Step 2: Detailed Explanation:
Context Analysis: The sentence describes wood sculptures as being "vulnerable to decay, insect damage and fire." It then contrasts them with sculptures made of "more durable materials." This contrast is about longevity and the ability to last over time despite threats.

Evaluating the Options:

- (A) dry out: This refers to losing moisture. While wood can dry out, it doesn't capture the broader idea of resisting decay, insects, and fire.
- (B) hang around: This is a very informal phrasal verb meaning to linger or remain in a place. It does not fit the formal tone of the sentence and doesn't accurately convey the meaning of enduring over time.
- (C) survive: This word means to continue to exist, especially in spite of danger or hardship. This perfectly fits the context of the sculptures resisting decay, damage, and fire.
- (D) stay on: This means to remain somewhere longer than expected, which is not the intended meaning.

The word "survive" best captures the idea of enduring against the mentioned vulnerabilities and provides the correct level of formality.

Step 3: Final Answer:
The best replacement for "hang around" is "survive", making the sentence read: "...they **survive** far less often than sculptuers made of more durable materials." Option (C) is correct.

Quick Tip

In word choice questions, always analyze the context and the tone (formal/informal) of the passage. The best answer will not only have the right meaning but will also match the overall style of the writing.

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5. Which one of the following is the correct grammatical form of the underlined portion?

Two out of every fifteen college students who major in computer science will go on to become small business owner at some point in their lives.

(A) small businesses owner
(B) small business owners
(C) small business's owners
(D) small business's owner

Correct Answer: (B) small business owners

Solution:

Step 1: Understanding the Concept:
This question tests the formation of plural compound nouns. A compound noun is a noun made up of two or more words. The question is how to make such a phrase plural.

Step 2: Detailed Explanation:
Subject Analysis: The subject being discussed is "Two out of every fifteen college students," which is a plural entity. Since multiple students are becoming owners, the noun "owner" must be in its plural form, "owners". This eliminates option (D).

Compound Noun Analysis: The phrase "small business owner" functions as a compound noun. Here, "small business" acts as a compound adjective describing the type of "owner". In English, adjectives do not take a plural form. Therefore, "small business" should remain singular.

Let's analyze the options:

- (A) small businesses owner: Incorrect. The adjective part ("small business") is pluralized, and the main noun ("owner") is singular. The main noun should be plural.
- (B) small business owners: Correct. The main noun ("owners") is plural to agree with the multiple students, and the adjectival part ("small business") remains singular.
- (C) small business's owners: Incorrect. The possessive form ('s) is not needed here. It would imply "the owners of a small business," which changes the meaning.
- (D) small business's owner: Incorrect. This is singular and possessive, both of which are wrong for this context.

The correct structure is to pluralize the final, most important noun in the compound phrase.

Step 3: Final Answer:
The correct grammatical form is "small business owners". Thus, option (B) is the correct answer.

> Quick Tip
>
> In a compound noun phrase where the first part describes the second part (e.g., car door, bus stop, business owner), you almost always pluralize only the last word (car doors, bus stops, business owners).

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6. Which of the following is the correct grammatical form of the underlined portion?

'Hansel and Gretel', an enchanting fairy tale, is the story of two young children whom stumble across a cottage made of gingerbread.

(A) whose stumble
(B) whom stumbled
(C) which stumble
(D) who stumble

Correct Answer: (D) who stumble

Solution:

Step 1: Understanding the Concept:
This question tests the correct usage of relative pronouns, specifically the difference between 'who' and 'whom'.

Step 2: Detailed Explanation:
'Who' vs. 'Whom':

- **Who** is a subject pronoun. It is used when the pronoun is the one performing the action of the verb.
- **Whom** is an object pronoun. It is used when the pronoun is the recipient of the action of the verb or the object of a preposition.

Applying the Rule:
To decide which pronoun to use, we need to look at the clause it introduces: "_____ stumble across a cottage".
In this clause, the verb is "stumble". We need to ask: who is doing the stumbling? The answer is "the children". The pronoun stands in for "the children" and acts as the **subject** of the verb

"stumble". Therefore, the correct subject pronoun is "who".

Analyzing the Options:

- (A) whose stumble: 'Whose' is a possessive pronoun, indicating ownership. It doesn't fit here.
- (B) whom stumbled: 'Whom' is an object pronoun, which is incorrect as a subject. Also, the main sentence is in the present tense ("is the story"), so the present tense "stumble" is more consistent than the past tense "stumbled".
- (C) which stumble: 'Which' is used to refer to animals or things, not people. Since we are referring to "children", 'which' is incorrect.
- (D) who stumble: Correct. 'Who' is the subject pronoun for people, and "stumble" is the correct verb form.

Step 3: Final Answer:
The correct phrase is "who stumble", making option (D) the correct answer.

Quick Tip

A simple trick to choose between 'who' and 'whom' is to substitute 'he/she' and 'him/her'. If 'he' or 'she' fits in the clause, use 'who'. If 'him' or 'her' fits, use 'whom'. For this question, "They/He/She stumble" makes sense, so 'who' is correct.

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7. Complete the concluding sentence of the following paragraph with one of the options given below:
Manufacturing companies are often faced with a trade-off between advances in productivity, which is one of the main goals of automation, and flexibility. When firms implement procedures that make repetitive processes more streamlined, they are able to produce more food at a faster rate. At the same time, however, _____.

(A) engagement in engineering teams frequently comes down.
(B) it is impossible to measure the impact of technology before it is launched.
(C) they become less likely to implement new and creative ideas.
(D) workers are able to focus on the most interesting parts of their jobs.

Correct Answer: (C) they become less likely to implement new and creative ideas.

Solution:

Step 1: Understanding the Concept:
This is a paragraph completion question that tests logical reasoning and comprehension. The task is to find a concluding sentence that logically follows from the ideas presented in the paragraph.

Step 2: Detailed Explanation:
Paragraph Analysis:

- **Main Idea:** The paragraph introduces a "trade-off" between two concepts: **productivity** (through automation and streamlined processes) and **flexibility**.
- **Supporting Detail:** It explains the benefit of streamlining: producing more at a faster rate (an increase in productivity).
- **Key Transition Word:** The sentence to be completed starts with "At the same time, however,". The word "however" is a crucial signal of contrast. It indicates that the concluding sentence will present the downside or the other side of the trade-off, which is the negative impact on flexibility.

Evaluating the Options:

- (A) engagement in engineering teams frequently comes down: This is too specific and not directly linked to the core trade-off between productivity and flexibility mentioned in the paragraph.
- (B) it is impossible to measure the impact of technology before it is launched: This is a general statement about technology but doesn't complete the specific trade-off argument of the paragraph.
- (C) they become less likely to implement new and creative ideas: This option directly addresses the loss of flexibility. "New and creative ideas" are a key component of flexibility. This provides the perfect contrast to the streamlined, repetitive processes mentioned earlier.
- (D) workers are able to focus on the most interesting parts of their jobs: This is a positive outcome, which contradicts the contrast signal "however".

The most logical conclusion is that the focus on streamlined, repetitive processes (productivity) comes at the cost of implementing new and creative ideas (flexibility).

Step 3: Final Answer:
Option (C) provides the most logical conclusion by presenting the negative side of the trade-off introduced in the paragraph.

Quick Tip

In paragraph completion tasks, always look for transition words like 'however', 'therefore', 'consequently', or 'in addition'. They provide strong clues about the logical direction of the argument and the content of the missing sentence.

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8. Complete the concluding sentence of the following paragraph with one of the options given below:
In the 1960s, Jane Goodall observed chimpanzees removing termites from hides with strapped

twigs. Initially, researchers were unable to determine whether the animals viewed a group of tasks as a single problem requiring a general tool set or used individual tools to solve specific tasks. The question was finally resolved when chimps were observed selecting tools to carry with them in anticipation of particular difficulties. Research, therefore, concluded that not only are chimpanzees capable of using tools in a sophisticated way, but they _____.

(A) showed marked innovation in tool usage depending on their species.
(B) manufacture tools to solve problems that they do not normally encounter.
(C) are capable of imagining future situations and adapting their behaviour accordingly.
(D) are genetically predisposed to create certain types of tools.

Correct Answer: (C) are capable of imagining future situations and adapting their behaviour accordingly.

Solution:

Step 1: Understanding the Concept:
This question requires you to draw a logical inference from the information provided in the paragraph to complete the final sentence.

Step 2: Detailed Explanation:
Paragraph Analysis:

- **Initial Observation:** Chimps use tools.
- **Research Question:** Do they use tools reactively for a specific task, or do they plan ahead?
- **Key Evidence / Resolution:** The question was resolved when chimps were seen "selecting tools to carry with them **in anticipation of particular difficulties**".
- **Conclusion Structure:** The conclusion begins "not only are chimpanzees capable of using tools... but they...". This means the second part must add a new, more profound insight based on the key evidence.

Interpreting the Key Evidence: The phrase "in anticipation of particular difficulties" is the most critical piece of information. It implies that the chimps are not just reacting to a problem in front of them; they are thinking ahead to a problem they expect to face in the future and preparing for it. This demonstrates foresight and planning.

Evaluating the Options:

- (A) showed marked innovation in tool usage depending on their species: The paragraph focuses on one group's behavior and doesn't compare different species.
- (B) manufacture tools to solve problems that they do not normally encounter: The paragraph mentions "removing termites," which is likely a normal activity. The key finding isn't about novelty but about planning.

- (C) are capable of imagining future situations and adapting their behaviour accordingly: This option perfectly summarizes the act of planning ahead. "Imagining future situations" corresponds to "in anticipation of particular difficulties," and "adapting their behaviour" corresponds to "selecting tools to carry with them."
- (D) are genetically predisposed to create certain types of tools: The paragraph discusses observed behavior, not genetics.

The evidence directly supports the conclusion that chimpanzees can plan for the future.

Step 3: Final Answer:
Option (C) is the best conclusion as it accurately reflects the inference drawn from the research evidence presented in the paragraph.

Quick Tip

For inference questions, locate the specific sentence or phrase that contains the core evidence. The correct answer will be a paraphrase or a logical extension of that specific piece of evidence, not just a general statement about the topic.

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9. Which one of the following best conveys the meaning of the given expression?

A person who works for the welfare of humankind:

(A) Misanthropist
(B) Philanderer
(C) Philanthropist
(D) Platonic

Correct Answer: (C) Philanthropist

Solution:

Step 1: Understanding the Concept:
This question is a test of vocabulary, specifically one-word substitution. You need to know the definition of each option to find the one that matches the given phrase.

Step 2: Detailed Explanation:
Let's analyze the roots of the words, which often give clues to their meanings:

- **Philanthropist:** This word comes from Greek roots. "Phil-" means 'love' and "anthropos" means 'humankind'. Therefore, a philanthropist is literally a "lover of humankind," a person who actively works to promote human welfare. This perfectly matches the definition.

- **Misanthropist:** This also comes from Greek roots. "Mis-" means 'hatred' and "anthropos" means 'humankind'. A misanthropist is a person who dislikes or distrusts humanity. This is the direct opposite of the given definition.
- **Philanderer:** This word refers to a man who engages in many casual romantic affairs. It is unrelated to the welfare of humankind in general.
- **Platonic:** This is an adjective, not a noun for a person. It describes a relationship (especially love or friendship) that is deep and affectionate but not sexual. It does not fit the definition.

Based on the definitions, "philanthropist" is the only word that means a person who works for the welfare of humankind.

Step 3: Final Answer:
The correct word for the given expression is **Philanthropist**. Thus, option (C) is correct.

Quick Tip

Learning common Greek and Latin roots (like phil-, mis-, anthropo-, -ist) is a powerful strategy for vocabulary questions. It can help you deduce the meanings of unfamiliar words and understand the relationships between them.

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10. Which one of the following best conveys the meaning of the given expression?

Extreme desire for wealth:

(A) Omnivorous
(B) Avaricious
(C) Gregarious
(D) Carnivorous

Correct Answer: (B) Avaricious

Solution:

Step 1: Understanding the Concept:
This is a vocabulary question that asks for a single word (an adjective) that means "having an extreme desire for wealth."

Step 2: Detailed Explanation:
We need to examine the definition of each option:

- **(A) Omnivorous:** This describes an animal or person that eats both plants and animals. From Latin 'omni' (all) and 'vorare' (to devour). It is related to diet, not wealth.

- **(B) Avaricious:** This adjective means having or showing extreme greed for wealth or material gain. It is a direct synonym for the given phrase. The noun form is 'avarice'. This is the correct answer.
- **(C) Gregarious:** This describes a person who is fond of company and sociable. It relates to personality and social behavior, not wealth.
- **(D) Carnivorous:** This describes an animal that eats meat. From Latin 'caro' (flesh) and 'vorare' (to devour). It is related to diet, not wealth.

Only "avaricious" relates to the concept of greed and an extreme desire for wealth.

Step 3: Final Answer:
The word that best conveys an "extreme desire for wealth" is **Avaricious**. Option (B) is correct.

Quick Tip

To build your vocabulary, try to learn words in groups. For example, when you learn 'avaricious', also look up related words like 'cupidity', 'greedy', 'covetous', and 'rapacious'. This helps to understand the nuances between similar words.

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11. Which one of the following words is the Antonym of the word- 'warily'?

(A) recklessly
(B) dramatically
(C) judiciously
(D) suspiciously

Correct Answer: (A) recklessly

Solution:

Step 1: Understanding the Concept:
This question asks for the antonym of the word 'warily'. An antonym is a word that has the opposite meaning.

Step 2: Detailed Explanation:
Definition of 'warily': The adverb 'warily' means to do something cautiously, carefully, and with a sense of potential danger or suspicion. It implies being watchful and on guard.

Now, we need to find the word among the options that means the opposite of being cautious and careful.

Analysis of the Options:

- **(A) recklessly:** This means doing something without any thought or care for the consequences; carelessly or heedlessly. This is the direct opposite of acting cautiously and warily.
- **(B) dramatically:** This means in a way that is exciting, impressive, or sudden. It does not have a direct relationship with the concept of caution.
- **(C) judiciously:** This means with good judgment or sense; wisely. Acting judiciously is a form of being careful, so this is more of a synonym than an antonym.
- **(D) suspiciously:** This means with a cautious distrust of someone or something. This is very close in meaning to 'warily' and is therefore a synonym.

The word that best expresses the opposite of acting with care and caution ('warily') is acting without any care ('recklessly').

Step 3: Final Answer:
The antonym of 'warily' is **recklessly**. Therefore, option (A) is the correct answer.

Quick Tip

When asked for an antonym, first define the given word clearly. Then, go through each option and see which one presents the most direct opposition to that definition. Be careful of options that are simply different, but not opposite, and options that are actually synonyms.

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12. Which one of the following words means the same as 'eradicate'?

(A) renew
(B) confuse
(C) evolve
(D) remove

Correct Answer: (D) remove

Solution:

Step 1: Understanding the Concept:
This question asks for a synonym of the word 'eradicate'. A synonym is a word that has the same or a very similar meaning to another word.

Step 2: Detailed Explanation:
Definition of 'eradicate': The verb 'eradicate' means to destroy completely, to get rid of something entirely, or to put a complete end to it. It implies a thorough and total elimination. For example, "to eradicate a disease."

Analysis of the Options:

- **(A) renew:** To make something new again or to resume an activity after an interruption. This is an antonym of destruction.
- **(B) confuse:** To make someone bewildered or perplexed. This is unrelated to eradication.
- **(C) evolve:** To develop gradually, especially from a simple to a more complex form. This is about development, not elimination.
- **(D) remove:** To take something away or off from the position occupied. In many contexts, it can mean to eliminate or get rid of something, making it the closest synonym to 'eradicate'. While 'eradicate' is stronger, 'remove' is the best fit among the choices.

Step 3: Final Answer:
Comparing the meanings, 'remove' is the word that most closely matches the meaning of 'eradicate'. Therefore, option (D) is the correct answer.

Quick Tip

When looking for a synonym, consider the intensity of the word. 'Eradicate' is a very strong word implying total destruction. While 'remove' can be less intense, in the context of synonyms, it is the best available choice that points towards elimination.

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13. Choose the correct meaning of the underlined phrase in the given context from the options given below:
The manager had to pull strings to get invitation passes for the concert.

(A) play music
(B) use personal influence
(C) to be courageous
(D) remain calm

Correct Answer: (B) use personal influence

Solution:

Step 1: Understanding the Concept:
This question tests your knowledge of idiomatic expressions. An idiom is a phrase whose meaning is not predictable from the usual meanings of its constituent elements.

Step 2: Detailed Explanation:
Meaning of the idiom 'pull strings': The idiom 'to pull strings' means to use one's influence and connections, often secretly or unofficially, to gain an advantage or to make something happen. The imagery comes from a puppeteer pulling strings to control a puppet.

Contextual Analysis: The sentence states the manager had to do this to "get invitation passes," which are likely limited or hard to obtain. This implies that a special effort or advantage was needed.

Analysis of the Options:

- **(A) play music:** This is a literal interpretation of 'strings' (as on a guitar or violin) and is incorrect in this idiomatic context.
- **(B) use personal influence:** This is the precise figurative meaning of 'pulling strings'. The manager used his connections to get the passes.
- **(C) to be courageous:** This means to be brave. While getting the passes might have required boldness, it's not the meaning of the idiom.
- **(D) remain calm:** This means to stay composed. It doesn't fit the action required to obtain something.

Step 3: Final Answer:
The correct meaning of 'pull strings' in this context is to 'use personal influence'. Option (B) is the correct answer.

Quick Tip

Context is crucial for understanding idioms. The phrase "to get invitation passes" suggests a situation where favors or connections might be necessary, pointing directly to the meaning of using personal influence.

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14. Complete the given sentence by choosing a suitable phrase from the options provided:

The Mayor filled up all the vacancies in his department with his _____.

(A) hard and fast
(B) kith and kin
(C) helter skelter
(D) baited breath

Correct Answer: (B) kith and kin

Solution:

Step 1: Understanding the Concept:
This question requires you to select the correct idiomatic phrase that fits logically and grammatically into the sentence.

Step 2: Detailed Explanation:
The sentence implies that the Mayor filled job vacancies with a specific group of people. We need to find the phrase that represents a group of people connected to the Mayor.

Analysis of the Options:

- **(A) hard and fast:** This phrase is an adjective meaning 'strict' or 'fixed' (e.g., "hard and fast rules"). It does not refer to people.
- **(B) kith and kin:** This is a noun phrase that means 'friends and relatives'. The sentence implies nepotism, where the Mayor hired his own friends and family. This fits the context perfectly.
- **(C) helter skelter:** This phrase is an adverb or adjective meaning 'in disorderly haste or confusion' (e.g., "they ran helter skelter"). It does not refer to people.
- **(D) baited breath:** The correct idiom is 'bated breath', which means 'in a state of suspense or anxiety'. It does not refer to people.

Step 3: Final Answer:
The phrase 'kith and kin' is the only one that refers to a group of people (friends and relatives) and makes sense in the context of filling vacancies. Therefore, option (B) is correct.

Quick Tip

Familiarize yourself with common English idioms and their meanings. 'Kith and kin' is a classic phrase for friends and family, often used in contexts discussing social connections or nepotism.

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15. Replace the underlined part in the following sentence with the correct phrase from the options given below:
He enjoys <u>to tell stories</u> to children.

(A) how to tell stories
(B) telling stories
(C) to narrate stories
(D) told stories

Correct Answer: (B) telling stories

Solution:

Step 1: Understanding the Concept:
This question tests the grammatical rule regarding which verb form—gerund (-ing form) or infinitive (to + verb)—should follow a specific main verb.

Step 2: Detailed Explanation:
The main verb in the sentence is "enjoys". In English grammar, certain verbs must be followed by a gerund, not an infinitive. The verb 'enjoy' is one of these verbs.
The correct structure is: **Subject + enjoy + gerund (verb-ing)**.

Analysis of the Options:

- **(A) how to tell stories:** This changes the meaning to "He enjoys the skill of telling stories," which is slightly different and not a direct correction of the grammatical error.
- **(B) telling stories:** This uses the gerund 'telling' after the verb 'enjoys'. This is the grammatically correct form.
- **(C) to narrate stories:** 'To narrate' is an infinitive, just like 'to tell'. It is grammatically incorrect to use an infinitive after 'enjoy'.
- **(D) told stories:** This is a past tense form and does not fit grammatically after 'enjoys'.

Step 3: Final Answer:
The correct structure requires a gerund after the verb "enjoys". The correct phrase is "telling stories". Option (B) is the correct answer.

Quick Tip

Memorize a list of common verbs that are followed by gerunds. Some of the most frequent ones include: enjoy, avoid, finish, mind, suggest, practice, and quit.

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16. Replace the underlined word in the following sentence with the correct word from the options given below:
The government tried to <u>illicit</u> support for the bill but failed.

(A) illicited
(B) elicit
(C) illiciting
(D) elicited

Correct Answer: (B) elicit

Solution:

Step 1: Understanding the Concept:
This question tests your understanding of commonly confused words, specifically the difference between 'illicit' and 'elicit'.

Step 2: Detailed Explanation:
Definition of the Words:

- **Illicit (adjective):** Means illegal, forbidden by law, rules, or custom. For example, "illicit drugs."
- **Elicit (verb):** Means to draw out or obtain a response, information, or support from someone. For example, "The question was intended to elicit a truthful answer."

Contextual Analysis: The sentence says the government "tried to _____ support". The government was trying to *obtain* or *draw out* support from others. This action requires a verb, and the meaning matches 'elicit'. The word 'illicit' is an adjective and does not fit grammatically or semantically.

Grammatical Form: The sentence structure is "tried to ____". The preposition 'to' here is part of the infinitive form of a verb. Therefore, the base form of the verb is required. The base form is 'elicit'.

Analysis of the Options:

- **(A) illicited:** Not a real word.
- **(B) elicit:** The correct verb in its base form, which fits grammatically after 'to'.
- **(C) illiciting:** Not a real word.
- **(D) elicited:** The past tense form of the verb. It is incorrect here because the base form is needed for the infinitive.

Step 3: Final Answer:
The correct word is the verb 'elicit' in its base form. Option (B) is the correct choice.

Quick Tip

A simple way to remember the difference: **E**licit is a verb related to **E**voking a response. **I**llicit is an adjective related to things that are **I**llegal.

---

17. Rearrange the following sentences to form a coherent and meaningful paragraph.
(A) The university president has proposed scheduling several introductory-level classes online in order to save money on building maintenance and energy costs.
(B) The curriculum would not be changed.
(C) With recent cut backs in educational funding, the state university must reduce its expenditure or face bankruptcy.
(D) Students enrolled in these proposed 'virtual classrooms' would be taught the full programme by the same instructors teaching in the regular classrooms.
Choose the correct answer from the options given below:

(A) (C), (B), (D), (A)
(B) (A), (C), (B), (D)
(C) (B), (A), (C), (D)

(D) (C), (A), (B), (D)

Correct Answer: (D) (C), (A), (B), (D)

Solution:

Step 1: Understanding the Concept:
This is a paragraph jumble (para jumble) question. The goal is to arrange the given sentences in a logical sequence to form a coherent paragraph.

Step 2: Detailed Explanation:
Identify the Opening Sentence: A good opening sentence introduces the main topic or problem. Sentence (C) establishes the context and the problem: the university is facing financial issues ("cut backs," "must reduce its expenditure"). This is an excellent starting point.

Find Logical Connections:

- After establishing the problem in (C), the next logical step would be to introduce a solution. Sentence (A) does exactly this: "The university president has proposed... classes online in order to save money." So, the sequence **C-A** is very strong.
- Now we need to place (B) and (D). Both sentences provide more details about the proposal mentioned in (A).
- Sentence (D) refers to "these proposed 'virtual classrooms'," which directly links back to the online classes mentioned in (A).
- Sentence (B) states that "The curriculum would not be changed." This is another detail clarifying the nature of the proposed change.
- Let's consider the order of details. The flow C-A-B-D seems logical. Problem (C) ->Solution (A) ->Clarification 1 (B: curriculum is same) ->Clarification 2 (D: instructors are same). This reassures that the quality of education remains the same. The order C-A-D-B is also possible. Let's check the options.

Evaluate the Options:

- (A) (C), (B), (D), (A): Placing details (B) and (D) before the solution (A) is illogical.
- (B) (A), (C), (B), (D): Starting with the solution (A) before the problem (C) is less logical.
- (C) (B), (A), (C), (D): Starting with (B) is abrupt and makes no sense.
- (D) (C), (A), (B), (D): This follows the logical flow: Problem ->Solution ->Supporting Detail 1 ->Supporting Detail 2. This creates a well-structured and coherent paragraph.

Step 3: Final Answer:
The most logical sequence is (C), (A), (B), (D). Option (D) is the correct answer.

Quick Tip

In para jumbles, look for the 'Problem-Solution' pattern. Identify the sentence that states a problem and the one that proposes a solution. This often gives you a solid starting pair of sentences.

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18. Rearrange the following sentences to form a coherent and meaningful paragraph.
(A) Lack of knowledge about the diet is what makes people raise questions.
(B) This diet often characterized as restrictive, is associated with health benefits, however, it raises concerns.
(C) The Vegan diet has gained momentum in recent years.
(D) There is a controversy about this diet with some people supporting it and others questioning its benefits.
Choose the correct answer from the options given below:

(A) (B), (C), (D),(A)
(B) (C), (B), (D), (A)
(C) (D),(C), (B), (A)
(D) (A), (D), (B), (C)

Correct Answer: (B) (C), (B), (D), (A)

Solution:

Step 1: Understanding the Concept:
This question requires arranging four jumbled sentences into a logical and coherent paragraph. The key is to identify the flow of ideas from general to specific.

Step 2: Detailed Explanation:
Identify the Opening Sentence: The best opening sentence is one that introduces the topic broadly. Sentence (C) introduces "The Vegan diet" and its recent popularity ("gained momentum"). This is a general, introductory statement.

Find Logical Connections:

- After introducing the topic in (C), we need to elaborate. Sentence (B) uses the phrase "This diet...", which clearly refers to the Vegan diet mentioned in (C). Sentence (B) introduces the central conflict: it has "health benefits" but also "raises concerns." This makes **C-B** a strong logical pair.
- Sentence (D) elaborates on the "concerns" mentioned in (B). It explicitly states, "There is a controversy about this diet...". The idea of a controversy directly follows from the mention of "concerns". This gives us the sequence **C-B-D**.
- Sentence (A) provides a reason for the controversy or the questions people have. It states, "Lack of knowledge... is what makes people raise questions." This sentence serves as a

concluding thought, explaining the root cause of the controversy mentioned in (D). So, (A) should logically come at the end.

The Final Sequence: The paragraph flows from a general introduction (C), to the introduction of a conflict (B), to an elaboration of that conflict (D), and finally to a reason for the conflict (A). The sequence is **C-B-D-A**.

Evaluate the Options:

- (A) (B), (C), (D),(A): Starts with "This diet...", which is awkward without prior context.
- (B) (C), (B), (D), (A): This matches our derived logical sequence.
- (C) (D),(C), (B), (A): Starting with the controversy before introducing the topic is less effective.
- (D) (A), (D), (B), (C): Starting with the reason (A) makes no sense.

Step 3: Final Answer:
The most coherent and logical order of the sentences is (C), (B), (D), (A). Option (B) is the correct answer.

Quick Tip

Look for "pronoun-antecedent" links. A pronoun like "this" or "it" in one sentence (the antecedent is what it refers to) usually refers to a noun in a preceding sentence. Here, "This diet" in (B) and (D) clearly refers to "The Vegan diet" introduced in (C).

---

19. Improve the following sentence by replacing the underlined word from the options given below. If the sentence cannot be improved, choose option 4.

The Board of Directors decided to <u>devolve</u> into the matter to find a solution.

(A) delve
(B) deduce
(C) deflect
(D) No improvement required

Correct Answer: (A) delve

Solution:

Step 1: Understanding the Concept:
This question requires choosing the correct word (verb) that fits the context of the sentence and correctly collocates with the preposition "into".

Step 2: Detailed Explanation:
Analyze the Underlined Word and Context:

- **Devolve:** This verb means to transfer or delegate power to a lower level. It can also mean to degenerate or be split into. For example, "The responsibility devolved upon the new manager" or "The discussion devolved into a shouting match." Neither meaning fits the context of investigating a matter to find a solution.
- **Context:** The Board of Directors wants to investigate or explore "the matter" in depth to "find a solution." We need a verb that means to investigate thoroughly.

Analyze the Options:

- **(A) delve:** This verb means to research or make painstaking inquiries into something. It is commonly followed by the preposition "into" (to delve into a subject/matter). This fits the context perfectly.
- **(B) deduce:** This verb means to arrive at a conclusion by reasoning. One might deduce a solution *from* an investigation, but one does not "deduce into" a matter.
- **(C) deflect:** This verb means to cause something to change direction. It is irrelevant to the context of investigation.
- **(D) No improvement required:** The original word 'devolve' is incorrect, so improvement is required.

Step 3: Final Answer:
The word 'delve' correctly means to investigate thoroughly and is properly used with the preposition 'into'. Therefore, it is the best replacement. Option (A) is correct.

Quick Tip

Pay attention to verb-preposition collocations. Certain verbs are almost always paired with specific prepositions. 'Delve into' is a strong and common collocation for meaning 'to explore in detail'.

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20. Choose the correct word from the following options which best expresses the phrase given below:
"Word for word"

(A) Verbose
(B) Verbatim
(C) Virtue
(D) Vicarious

Correct Answer: (B) Verbatim

Solution:

Step 1: Understanding the Concept:
This is a one-word substitution question. You need to find a single word that has the same meaning as the given phrase "Word for word".

Step 2: Detailed Explanation:
Meaning of "Word for word": This phrase means in exactly the same words; precisely as spoken or written, without any changes or paraphrasing.

Analysis of the Options:

- **(A) Verbose:** This is an adjective meaning using or expressed in more words than are needed. This is about being wordy, not about being exact.
- **(B) Verbatim:** This is an adverb and adjective that comes from Latin and literally means 'word for word'. It means to repeat something in exactly the same words that were used originally. This is a perfect match for the given phrase.
- **(C) Virtue:** This is a noun meaning behavior showing high moral standards. It is unrelated to the phrase.
- **(D) Vicarious:** This is an adjective meaning experienced in the imagination through the feelings or actions of another person (e.g., vicarious pleasure). It is unrelated.

Step 3: Final Answer:
The word that means exactly "word for word" is **Verbatim**. Option (B) is the correct answer.

Quick Tip

Both 'verbose' and 'verbatim' are derived from the Latin root 'verbum', meaning 'word'. 'Verbatim' focuses on the exactness of the words, while 'verbose' focuses on the excessive quantity of words.

---

21. Choose the appropriate Synonym of the given word from the options given below:
'DEMURE'

(A) Withdrawn
(B) Shy
(C) Brazen
(D) Brash

Correct Answer: (B) Shy

Solution:

Step 1: Understanding the Concept and the Given Word
The question asks for a **synonym**, which is a word that has the same or a very similar meaning to another word. The word we need to find a synonym for is **'demure'**.
'Demure' is an adjective, typically used to describe a person (often a woman) who is modest, reserved, and shy in their manner, dress, and behavior. It suggests a quiet, proper, and well-behaved nature. For example, "She gave a demure smile and looked away."

Step 2: Detailed Analysis of Each Option

- **(A) Withdrawn:** This adjective describes someone who is very quiet and does not like to communicate with others. While a demure person is reserved, 'withdrawn' can imply a negative sense of social isolation, which is not necessarily part of being demure. It is related, but not the best fit.

- **(B) Shy:** This adjective means being timid, nervous, or uncomfortable in the company of other people. This is a core characteristic of being demure. A demure person's reserved behavior often stems from shyness and modesty. This is a very strong synonym.

- **(C) Brazen:** This adjective means bold, shameless, and impudent. For example, "He told a brazen lie to the teacher." This is the direct opposite of being modest and reserved. Therefore, 'brazen' is an **antonym** of 'demure'.

- **(D) Brash:** This adjective describes someone who is self-assertive in a rude, noisy, or overconfident way. It implies a lack of respect and subtlety. This is also an **antonym** of 'demure'.

Step 3: Final Answer Selection
Comparing the options, 'shy' captures the essential quality of being reserved and modest that defines 'demure'. 'Withdrawn' is a possible but less precise choice. 'Brazen' and 'Brash' are opposites. Therefore, 'Shy' is the most appropriate synonym.

Quick Tip

When faced with synonym questions, first define the given word in your mind. Then, evaluate each option to see which one aligns best. Also, be aware of antonyms (opposites); eliminating them can quickly narrow down your choices.

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22. Choose the appropriate meaning of the following Idiom from the options given below:
(To) Hit the nail on the head means:

(A) Severe blow on the head
(B) Hit somebody hard
(C) To do or say exactly the right thing
(D) Hit the coffin with a hammer on the head side of the lid

Correct Answer: (C) To do or say exactly the right thing

Solution:

Step 1: Understanding Idioms
An idiom is a phrase or expression that has a figurative meaning, which is different from the literal meaning of its individual words. To solve this, we must ignore the literal image of a hammer and a nail and recall its established figurative sense.

Step 2: Analyzing the Idiom's Imagery and Meaning
The literal image is of a carpenter hitting a nail perfectly with a hammer. A good carpenter doesn't miss or hit the nail at an angle; they hit it "on the head" squarely and efficiently. This action is precise, accurate, and effective.
Figuratively, this idea of precision and effectiveness is transferred to words or actions. When someone "hits the nail on the head," they have said or done something that is exactly right, accurately identifying the cause of a problem or expressing a thought perfectly.

Step 3: Detailed Analysis of Each Option

- **(A) Severe blow on the head:** This is a literal interpretation of the words "hit" and "head" and is incorrect.

- **(B) Hit somebody hard:** This is another literal interpretation, taking the phrase to mean a physical assault, which is incorrect.

- **(C) To do or say exactly the right thing:** This option perfectly captures the figurative meaning of being precise, accurate, and correct. If someone says, "You really hit the nail on the head with that analysis," they mean the analysis was perfectly accurate.

- **(D) Hit the coffin with a hammer on the head side of the lid:** This is a very specific and literal interpretation, twisting the words to fit a different context. It is incorrect.

Step 4: Final Answer Selection
The correct meaning of the idiom is the figurative one related to accuracy and correctness. Thus, option (C) is the correct answer.

Quick Tip

For idiom questions, options that provide a literal meaning of the words are almost always incorrect distractors. Focus on finding the figurative, established meaning of the phrase.

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23. A and B started a business with investment of 60,000 and 90,000 respectively. After 5 months, B left the business and C joined with a capital which is 60,000 less than that of B. If at the end of the year, the share of C in the profit was 42,000, then find the total profit earned at the end of the year.

(A) 2,16,000
(B) 2,36,000
(C) 2,46,000
(D) 2,76,000

Correct Answer: (D) 2,76,000

Solution:

Step 1: Understanding Partnership Profit Sharing
In a business partnership, profits are shared based on each partner's contribution. This contribution is measured not just by the amount of money (capital) invested, but also by the duration for which it was invested. The fundamental rule is:

$$\text{Ratio of Profits} = \text{Ratio of (Capital} \times \text{Time)}$$

Step 2: Calculating the Effective Investment for Each Partner
The total business duration is one year (12 months). We calculate the '(Capital × Time)' product for A, B, and C.

- **Partner A:** - Capital = 60,000 - Time = 12 months (for the whole year) - Effective Investment (A) $= 60,000 \times 12 = 720,000$
- **Partner B:** - Capital = 90,000 - Time = 5 months - Effective Investment (B) $= 90,000 \times 5 = 450,000$
- **Partner C:** - Capital = 90,000 - 60,000 = 30,000 - Time = C joined when B left (after 5 months) and stayed till the end, so $12 - 5 = 7$ months. - Effective Investment (C) $= 30,000 \times 7 = 210,000$

Step 3: Determining the Profit-Sharing Ratio
The ratio of profits for A : B : C is the ratio of their effective investments.

$$\text{Profit Ratio} = 720,000 : 450,000 : 210,000$$

To simplify, we can divide all parts by a common factor like 10,000.

$$\text{Simplified Ratio} = 72 : 45 : 21$$

All three numbers are divisible by 3.

$$\text{Final Ratio (A : B : C)} = \frac{72}{3} : \frac{45}{3} : \frac{21}{3} = \mathbf{24 : 15 : 7}$$

Step 4: Calculating the Total Profit
This ratio means that for every $24 + 15 + 7 = 46$ parts of profit, C receives 7 parts. Let's represent the profit shares as $24x$, $15x$, and $7x$. We are given that C's actual share is 42,000.

$$7x = 42,000$$

We find the value of one part, x:

$$x = \frac{42,000}{7} = 6,000$$

The total profit is the sum of all parts, which is $46x$.

$$\text{Total Profit} = 46 \times x = 46 \times 6,000 = \ 2,76,000$$

Step 5: Final Answer
The total profit earned at the end of the year is 2,76,000. Option (D) is correct.

Quick Tip

In partnership problems, always set up the ratio of (Investment × Time). Simplify the ratio as much as possible before proceeding with calculations to avoid handling large numbers.

---

24. A sum of 61,000 is lent on simple interest in two parts in such a way that the interest on one part at 10% for 5 years is equal to that on the other part at 9% for 8 years. The sum lent at 10% is :-

(A) 39,000
(B) 36,000
(C) 32,000
(D) 30,000

Correct Answer: (B) 36,000

Solution:

Step 1: Setting Up Variables
Let the two parts of the sum be P and P. We are given:

$$P_1 + P_2 = 61,000$$

P is the sum lent at 10% for 5 years. P is the sum lent at 9% for 8 years.
Step 2: Applying the Simple Interest Formula
The formula for Simple Interest (SI) is $\text{SI} = \frac{P \times R \times T}{100}$.

- Interest on the first part (SI): $\text{SI}_1 = \frac{P_1 \times 10 \times 5}{100} = \frac{50P_1}{100}$
- Interest on the second part (SI): $\text{SI}_2 = \frac{P_2 \times 9 \times 8}{100} = \frac{72P_2}{100}$

Step 3: Using the Equality Condition to Find the Ratio of Principals
The problem states that the interests are equal: SI = SI.

$$\frac{50P_1}{100} = \frac{72P_2}{100}$$

We can cancel the 100 from both sides.

$$50P_1 = 72P_2$$

This gives us the ratio of the principals:

$$\frac{P_1}{P_2} = \frac{72}{50} = \frac{36}{25}$$

So, the total sum of 61,000 is divided in the ratio 36 : 25.
Step 4: Dividing the Total Sum in the Calculated Ratio
The sum of the ratio parts is $36 + 25 = 61$. The total sum of 61,000 corresponds to these 61 parts. The question asks for the sum lent at 10%, which is P. P corresponds to 36 parts.

$$P_1 = \left(\frac{\text{P's ratio part}}{\text{Sum of ratio parts}} \right) \times \text{Total Sum}$$

$$P_1 = \left(\frac{36}{61} \right) \times 61,000 = 36 \times 1,000 = \ 36,000$$

Step 5: Final Answer
The sum lent at 10% is 36,000. Option (B) is correct.

> Quick Tip
>
> When interests are equal ($P_1R_1T_1 = P_2R_2T_2$), the principals are in the inverse ratio of the product of their rates and times ($P_1/P_2 = R_2T_2/R_1T_1$). This shortcut can save time.

---

25. Aman invested a sum of P for 2 years at 12% p.a. compound interest and received some interest. Ajay invested (P+3000) for 3 years at 8% p.a. simple interest and received the interest same as received by Aman. The sum invested by Aman is

(A) 25,000
(B) 50,000
(C) 60,000
(D) 65,000

Correct Answer: (B) 50,000

Solution:

Step 1: Understanding the Problem Structure
The problem requires us to calculate Compound Interest (CI) for Aman and Simple Interest (SI) for Ajay. The core condition is that the interest amounts are equal. We will set up an equation $\text{CI}_{\text{Aman}} = \text{SI}_{\text{Ajay}}$ and solve for the unknown principal, P.
Step 2: Detailed Calculation of Aman's Compound Interest (CI)
The formula for CI is $CI = P\left[\left(1+\frac{R}{100}\right)^T - 1\right]$.

- Principal = P, Rate (R) = 12%, Time (T) = 2 years.

$$CI_{Aman} = P\left[\left(1+\frac{12}{100}\right)^2 - 1\right] = P\left[(1.12)^2 - 1\right]$$

$$CI_{Aman} = P[1.2544 - 1] = 0.2544P$$

Step 3: Detailed Calculation of Ajay's Simple Interest (SI)
The formula for SI is $SI = \frac{P\times R\times T}{100}$.

- Principal = $P + 3000$, Rate (R) = 8%, Time (T) = 3 years.

$$SI_{Ajay} = \frac{(P+3000)\times 8\times 3}{100} = \frac{(P+3000)\times 24}{100}$$

$$SI_{Ajay} = 0.24(P+3000) = 0.24P + (0.24\times 3000) = 0.24P + 720$$

Step 4: Equating the Interests and Solving for P
Given $CI_{Aman} = SI_{Ajay}$:

$$0.2544P = 0.24P + 720$$

Group the terms with P on one side:

$$0.2544P - 0.24P = 720$$

$$0.0144P = 720$$

Isolate P:

$$P = \frac{720}{0.0144} = \frac{720\times 10000}{144}$$

Since $720 \div 144 = 5$:

$$P = 5\times 10000 = 50,000$$

Step 5: Final Answer
The sum invested by Aman (P) is 50,000. Option (B) is correct.

Quick Tip

For 2 years of compound interest, you can use the formula for effective rate: $R_{eff} = R_1 + R_2 + \frac{R_1R_2}{100}$. Here, $12+12+\frac{12\times 12}{100} = 24+1.44 = 25.44\%$. So, CI is 25.44% of P. For simple interest, the total percentage is $R\times T = 8\times 3 = 24\%$.

26. Two bikes were sold for a total of 1,50,000. One bike was sold at $33\frac{1}{3}\%$ loss and the other at 20% profit. The cost price of the first bike is equal to the selling price of the other bike. Find the over all loss.

(A) 10,000
(B) 12,000
(C) 15,000
(D) 18,000

Correct Answer: (C) 15,000

Solution:

Step 1: Define Variables and Translate into Equations
Let CP and SP be the cost and selling prices of the first bike. Let CP and SP be the cost and selling prices of the second bike.

1. Total selling price: $SP_1 + SP_2 = 1,50,000$
2. First bike: Loss $= 33\frac{1}{3}\% = \frac{1}{3}$. So, $SP_1 = \left(1 - \frac{1}{3}\right) CP_1 = \frac{2}{3}CP_1$
3. Second bike: Profit $= 20\% = \frac{1}{5}$. So, $SP_2 = \left(1 + \frac{1}{5}\right) CP_2 = \frac{6}{5}CP_2$
4. The crucial link: $CP_1 = SP_2$

Step 2: Solve the System of Equations
We use the linking equation $CP_1 = SP_2$ to connect the other equations. Substitute $CP_1 = SP_2$ into the equation for the first bike:

$$SP_1 = \frac{2}{3}CP_1 \implies SP_1 = \frac{2}{3}SP_2$$

Now substitute this into the total selling price equation:

$$SP_1 + SP_2 = 1,50,000 \implies \frac{2}{3}SP_2 + SP_2 = 1,50,000$$

$$\frac{5}{3}SP_2 = 1,50,000 \implies SP_2 = 1,50,000 \times \frac{3}{5} = \ 90,000$$

Step 3: Find All Remaining Values
Now that we have SP, we can find all other values.

- From $CP_1 = SP_2$, we have **CP = 90,000**.
- From $SP_1 + SP_2 = 1,50,000$, we have $SP_1 = 1,50,000 - 90,000 =$ **60,000**.
- From $SP_2 = \frac{6}{5}CP_2$, we have $90,000 = \frac{6}{5}CP_2$.

$$CP_2 = 90,000 \times \frac{5}{6} = 15,000 \times 5 = \ \textbf{75,000}$$

Step 4: Calculate the Overall Profit or Loss

- Total Cost Price (Total CP) = $CP_1 + CP_2 = 90,000 + 75,000 =$ 1,65,000.
- Total Selling Price (Total SP) = $SP_1 + SP_2 =$ 1,50,000.

Since Total CP >Total SP, there is an overall loss.

$$\text{Overall Loss} = \text{Total CP} - \text{Total SP} = 1,65,000 - 1,50,000 = \ 15,000$$

Step 5: Final Answer
The overall loss is 15,000. Option (C) is correct.

> **Quick Tip**
>
> When a problem gives a relationship between the CP of one item and the SP of another, use that as the bridge to express all values in terms of a single variable and solve.

---

27. What will be the profit percentage on selling an article at a certain price if there is 30% loss on selling the article at $\frac{2}{5}$ of the selling price?

(A) 20%
(B) 25%
(C) $33\frac{1}{3}\%$
(D) $16\frac{2}{3}\%$

Correct Answer: (D) $16\frac{2}{3}\%$

Solution:

Step 1: Addressing the Discrepancy
A direct calculation using the fraction $\frac{2}{5}$ results in a profit of 75%, which is not among the options. This strongly suggests a typographical error in the question, a common occurrence in exams. The option $16\frac{2}{3}\%$ corresponds to a fraction of $\frac{3}{5}$. We will proceed by solving for the fraction $\frac{3}{5}$ to match the provided answer key.
Step 2: Setting up Equations from the Hypothetical Scenario
Let CP = Cost Price and SP = the actual Selling Price. The problem describes a hypothetical situation:

- Hypothetical selling price (SP') = $\frac{3}{5} \times$ SP.
- At this price SP', there is a 30% loss. A 30% loss means the item was sold for 70% of its cost price. So, $\text{SP}' = (100\% - 30\%) \times \text{CP} = 0.7 \times \text{CP}$.

Step 3: Finding the Relationship Between Actual SP and CP
We have two expressions for SP'. We set them equal to find the link between SP and CP.

$$\frac{3}{5}\text{SP} = 0.7\text{CP}$$

Solve for SP:

$$\text{SP} = \left(\frac{0.7 \times 5}{3}\right)\text{CP} = \frac{3.5}{3}\text{CP}$$

Step 4: Calculating the Actual Profit Percentage
The formula for profit percentage is $\frac{\text{SP}-\text{CP}}{\text{CP}} \times 100$. First, find the profit in terms of CP:

$$\text{Profit} = \text{SP} - \text{CP} = \frac{3.5}{3}\text{CP} - \text{CP} = \left(\frac{3.5}{3} - \frac{3}{3}\right)\text{CP} = \frac{0.5}{3}\text{CP} = \frac{1/2}{3}\text{CP} = \frac{1}{6}\text{CP}$$

Now, calculate the profit percentage:

$$\text{Profit \%} = \frac{\text{Profit}}{\text{CP}} \times 100 = \frac{\frac{1}{6}\text{CP}}{\text{CP}} \times 100 = \frac{1}{6} \times 100 = 16.66...\% = 16\frac{2}{3}\%$$

Step 5: Final Answer
The profit percentage is $16\frac{2}{3}\%$. Option (D) is correct.

> Quick Tip
>
> In such problems, it's often easier to assume an initial SP, like 100. Then the new SP' would be $(\frac{3}{5}) \times 100 = 60$. A 30% loss means 60 is 70% of the CP. So, $0.7 \times \text{CP} = 60 \implies \text{CP} = \frac{600}{7}$. Now, find the profit on the original SP of 100: Profit $= 100 - \frac{600}{7} = \frac{100}{7}$. Profit % $= \frac{\text{Profit}}{\text{CP}} \times 100 = \frac{100/7}{600/7} \times 100 = \frac{1}{6} \times 100$.

---

28. In an election between two candidates, a candidate who got 30% of the total votes is defeated by 15000 votes. The number of votes obtained by the winning candidate is:-

(A) 26,250
(B) 25,250
(C) 24,250
(D) 26,150

Correct Answer: (A) 26,250

Solution:

Step 1: Determine the Vote Distribution Percentage
Since there are only two candidates, their vote percentages must add up to 100%.

- Losing candidate's vote share = 30%
- Winning candidate's vote share = 100% − 30% = 70%

Step 2: Find the Margin of Victory in Percentage Terms
The margin of defeat (15,000 votes) is the difference between the winner's and loser's votes. Let's find this difference in percentage points.

$$\text{Percentage Margin} = 70\% - 30\% = 40\%$$

This means that 40% of the total votes corresponds to 15,000 votes.

Step 3: Calculate the Total Number of Votes

Let T be the total number of votes.

$$40\% \text{ of } T = 15,000$$

$$\frac{40}{100} \times T = 15,000$$

$$T = 15,000 \times \frac{100}{40} = 15,000 \times \frac{5}{2} = 7,500 \times 5 = 37,500$$

The total number of votes cast was 37,500.

Step 4: Calculate the Number of Votes for the Winning Candidate

The winning candidate received 70

$$\text{Votes for Winner} = 70\% \text{ of } 37,500 = \frac{70}{100} \times 37,500 = 0.7 \times 37,500 = 26,250$$

Step 5: Final Answer

The winning candidate obtained 26,250 votes. Option (A) is correct.

Quick Tip

Once you find the percentage difference (40%) that corresponds to the vote difference (15,000), you can use ratios. If 40% is 15,000, what is 70% (the winner's share)? Value $= \frac{15,000}{40} \times 70 = 375 \times 70 = 26,250$. This method avoids calculating the total number of votes.

---

29. Three pipes A, B and C can fill a tank in 10, 15 and 20 hours respectively. Pipe A was opened at 6 AM, pipe B at 7 AM and pipe C at 8 AM. At what time was the tank completely filled, if pipe C needs a break of 1 hour after remaining open for 3 hours?

(A) 11:20 AM
(B) 12:30 PM
(C) 11:30 AM
(D) 12:15 PM

Correct Answer: (C) 11:30 AM

Solution:

Step 1: Define Total Work and Calculate Individual Efficiencies

Let the total work (capacity of the tank) be the LCM of the times taken by the pipes.

$$\text{Total Work} = \text{LCM}(10, 15, 20) = 60 \text{ units}$$

The efficiency of each pipe is the work it does per hour.

- Efficiency of A $= \frac{60}{10} = 6$ units/hour.
- Efficiency of B $= \frac{60}{15} = 4$ units/hour.
- Efficiency of C $= \frac{60}{20} = 3$ units/hour.

Step 2: Track the Filling of the Tank Chronologically

- **From 6 AM to 7 AM (1 hour):** Only Pipe A is working. Work done $= 1 \times 6 = 6$ units.
- **From 7 AM to 8 AM (1 hour):** Pipes A and B are working. Combined efficiency $= 6 + 4 = 10$ units/hour. Work done $= 1 \times 10 = 10$ units.

Total units filled by 8 AM $= 6 + 10 = 16$ units. Remaining work $= 60 - 16 = 44$ units.
Step 3: Calculate Work Done with All Pipes and Consider the Break
From 8 AM, all three pipes are open. Combined efficiency $= 6 + 4 + 3 = 13$ units/hour. Pipe C starts at 8 AM and works for 3 hours until 11 AM.

- **From 8 AM to 11 AM (3 hours):** All three pipes work. Work done $= 3 \times 13 = 39$ units.

Total units filled by 11 AM $= 16$ (before 8 AM) $+ 39 = 55$ units. Remaining work at 11 AM $= 60 - 55 = 5$ units.
Step 4: Calculate the Time for the Final Phase
At 11 AM, Pipe C takes its 1-hour break (from 11 AM to 12 PM). During this time, only pipes A and B are working.

- Efficiency of A + B $= 6 + 4 = 10$ units/hour.
- Time to fill remaining 5 units $= \frac{\text{Remaining Work}}{\text{Efficiency}} = \frac{5}{10} = 0.5$ hours.

0.5 hours is equal to 30 minutes.
Step 5: Determine the Final Time
The tank will be completely filled 30 minutes after 11 AM.

$$\text{Final Time} = 11:00 \text{ AM} + 30 \text{ minutes} = 11:30 \text{ AM}$$

> Quick Tip
>
> For time and work problems with staggered start times, it's best to create a timeline. Calculate the work done up to the point where all participants are working together, and then proceed, carefully handling any special conditions like breaks.

---

30. A tank has four pipes P, P, P and P. The tank can be filled in 15 minutes by pipes P, P, P together. It can be filled in 20 minutes by pipes P, P, P together and it can be filled by pipes P, P together in 30 minutes. If all the pipes are opened together, then in how much time will the tank be filled?

(A) 10 min 20 sec
(B) 12 min 20 sec

(C) 13 min 20 sec
(D) 11 min 20 sec

Correct Answer: (C) 13 min 20 sec

Solution:

Step 1: Define Rates and Formulate Equations
Let p_1, p_2, p_3, p_4 be the rates of each pipe (fraction of the tank filled per minute). The total work is 1 tank. The rate is $\frac{1}{\text{Time}}$.

1. $p_1 + p_2 + p_3 = \frac{1}{15}$ —(1)
2. $p_2 + p_3 + p_4 = \frac{1}{20}$ —(2)
3. $p_1 + p_4 = \frac{1}{30}$ —(3)

We need to find the time for all four pipes, which means we need their combined rate ($p_1 + p_2 + p_3 + p_4$).
Step 2: Solve the System of Equations
Adding the three equations is the most efficient method here.

$$(p_1 + p_2 + p_3) + (p_2 + p_3 + p_4) + (p_1 + p_4) = \frac{1}{15} + \frac{1}{20} + \frac{1}{30}$$

Combine like terms:

$$2p_1 + 2p_2 + 2p_3 + 2p_4 = \frac{1}{15} + \frac{1}{20} + \frac{1}{30}$$

$$2(p_1 + p_2 + p_3 + p_4) = \frac{4 + 3 + 2}{60} = \frac{9}{60} = \frac{3}{20}$$

Step 3: Calculate the Total Combined Rate
Divide by 2 to get the combined rate of all four pipes:

$$p_1 + p_2 + p_3 + p_4 = \frac{3}{20 \times 2} = \frac{3}{40} \text{ tank/minute}$$

Step 4: Calculate the Total Time
Time $= \frac{\text{Total Work}}{\text{Rate}}$.

$$\text{Time} = \frac{1}{3/40} = \frac{40}{3} \text{ minutes}$$

Step 5: Convert Time into Minutes and Seconds

$$\frac{40}{3} \text{ minutes} = 13\frac{1}{3} \text{ minutes} = 13 \text{ minutes} + \frac{1}{3} \text{ minute}$$

$$\frac{1}{3} \text{ minute} = \frac{1}{3} \times 60 \text{ seconds} = 20 \text{ seconds}$$

The total time is 13 minutes and 20 seconds.

> Quick Tip
>
> When you see a system of equations where variables appear symmetrically (like here), adding all the equations together is often a quick way to find the sum of all variables.

31. A and B have to travel from place P to place Q following the same route in their respective cars. A drives at 60 kmph while B drives at 80 kmph. Find the time taken by B to reach place Q if A takes 12 hrs.

(A) 8 hrs
(B) 10 hrs
(C) 9 hrs
(D) 6 hrs

Correct Answer: (C) 9 hrs

Solution:

Step 1: Identify the Constant Factor
Both A and B travel the same route from P to Q, which means the **distance** is constant for both. When distance is constant, speed and time are inversely proportional.
Method 1: Direct Calculation
Step 2a: Calculate the Distance
Using the information for car A and the formula Distance = Speed × Time:

$$\text{Distance} = 60 \text{ km/h} \times 12 \text{ h} = 720 \text{ km}$$

Step 3a: Calculate the Time for B
Using the calculated distance for car B and the formula Time = $\frac{\text{Distance}}{\text{Speed}}$:

$$\text{Time for B} = \frac{720 \text{ km}}{80 \text{ km/h}} = 9 \text{ hours}$$

Method 2: Using Ratios
Step 2b: Set up the Inverse Proportionality
Since distance is constant, $S_A \times T_A = S_B \times T_B$. This can be written as a ratio:

$$\frac{T_B}{T_A} = \frac{S_A}{S_B}$$

Step 3b: Solve for Time B
Plug in the known values:

$$\frac{T_B}{12} = \frac{60}{80} = \frac{3}{4}$$

$$T_B = 12 \times \frac{3}{4} = 9 \text{ hours}$$

Step 4: Final Answer
Both methods show that the time taken by B is 9 hours. Option (C) is correct.

Quick Tip

When distance is constant, the ratio of speeds is the inverse of the ratio of times taken. If Speed Ratio A:B is 60:80 (or 3:4), then the Time Ratio A:B will be 4:3. If A's time (4 parts) is 12 hours, then 1 part is 3 hours. So B's time (3 parts) is $3 \times 3 = 9$ hours.

---

32. On a straight road, a bus is 60 km ahead of a car running in the same direction. After 3 hours, the car is 90 km ahead of the bus. If the speed of the bus is 45 km/h, then what is the speed of the car (in km/h)?

(A) 90
(B) 92
(C) 95
(D) 105

Correct Answer: (C) 95

Solution:

Step 1: Understanding Relative Speed
When two objects move in the same direction, their relative speed is the difference between their individual speeds. It represents the rate at which the distance between them changes.

$$S_{rel} = S_{faster} - S_{slower} = S_{car} - S_{bus}$$

Step 2: Analyzing the Change in Relative Distance

- **Initial Position (t=0):** Car is 60 km behind the bus.
- **Final Position (t=3 hours):** Car is 90 km ahead of the bus.

The total distance the car has to "gain" on the bus is the sum of the initial gap it has to close and the new lead it has to create.

$$\text{Relative Distance Covered} = 60 \text{ km} + 90 \text{ km} = 150 \text{ km}$$

Step 3: Calculating the Relative Speed
The car gained 150 km on the bus in 3 hours. We can calculate the relative speed:

$$S_{rel} = \frac{\text{Relative Distance}}{\text{Time}} = \frac{150 \text{ km}}{3 \text{ hours}} = 50 \text{ km/h}$$

This means the car is 50 km/h faster than the bus.
Step 4: Calculating the Actual Speed of the Car
We know $S_{rel} = S_{car} - S_{bus}$ and the speed of the bus is 45 km/h.

$$50 = S_{car} - 45$$

$$S_{car} = 50 + 45 = 95 \text{ km/h}$$

Step 5: Final Answer
The speed of the car is 95 km/h. Option (C) is correct.

> Quick Tip
>
> Visualize the problem. The car closes a 60 km gap and creates a 90 km gap. The total change in relative position is 150 km. This change happened over 3 hours, so the rate of change (relative speed) is $150/3 = 50$ km/h. Since this is the difference in speeds, the car must be going 50 km/h faster than the bus: $45 + 50 = 95$ km/h.

---

33. A train running at the speed of 90 kmph crosses a 250 m long platform in 26 seconds. What is the length of the train (in m)?

(A) 300
(B) 400
(C) 500
(D) 600

Correct Answer: (B) 400

Solution:

Step 1: Understanding the Concept
When a train crosses a platform, the total distance it travels from the moment its engine enters the platform to the moment its last coach leaves is the sum of its own length and the platform's length.

$$\text{Total Distance} = \text{Length of Train} + \text{Length of Platform}$$

Step 2: Ensure Consistent Units
The data uses km/h, meters, and seconds. We must convert the speed to m/s to be consistent.

$$\text{Speed in m/s} = \text{Speed in km/h} \times \frac{5}{18}$$

$$\text{Speed} = 90 \times \frac{5}{18} = 5 \times 5 = 25 \text{ m/s}$$

Step 3: Set Up and Solve the Equation
Let L_t be the length of the train in meters. Using the formula Distance = Speed × Time:

$$L_t + \text{Length of Platform} = \text{Speed} \times \text{Time}$$

$$L_t + 250 = 25 \times 26$$

$$L_t + 250 = 650$$

$$L_t = 650 - 250 = 400 \text{ meters}$$

Step 4: Final Answer
The length of the train is 400 meters. Option (B) is correct.

> Quick Tip
>
> Always remember the conversion factor for speed: km/h to m/s is $\times \frac{5}{18}$, and m/s to km/h is $\times \frac{18}{5}$. Unit consistency is the most common source of errors in these problems.

---

34. 5 men and 4 women can earn 20,000 in 8 days. 10 men and 7 women can earn 23,750 in 5 days. In how many days will 5 men and 6 women earn 12,000?

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

Correct Answer: (B) 4

Solution:

Step 1: Define Variables and Convert to Daily Rates
Let m be the daily earning of one man and w be the daily earning of one woman.

- **Scenario 1:** 5 men and 4 women earn 20,000 in 8 days. Their combined earning per day $= \frac{20{,}000}{8} =$ $2,500$. Equation 1:
$$5m + 4w = 2500$$
- **Scenario 2:** 10 men and 7 women earn 23,750 in 5 days. Their combined earning per day $= \frac{23{,}750}{5} =$ $4,750$. Equation 2:
$$10m + 7w = 4750$$

Step 2: Solve the System of Linear Equations
Multiply Equation 1 by 2 to make the coefficient of m equal in both equations.

$$2 \times (5m + 4w) = 2 \times 2500 \implies 10m + 8w = 5000 \quad —(3)$$

Subtract Equation 2 from Equation 3 to eliminate m.

$$(10m + 8w) - (10m + 7w) = 5000 - 4750$$

$$w = 250$$

A woman earns 250 per day. Substitute this into Equation 1:

$$5m + 4(250) = 2500 \implies 5m + 1000 = 2500 \implies 5m = 1500 \implies m = 300$$

A man earns 300 per day.

Step 3: Answer the Final Question
Calculate the combined daily earning of the new group (5 men and 6 women).

$$\text{Daily Earning} = (5 \times m) + (6 \times w) = (5 \times 300) + (6 \times 250) = 1500 + 1500 = \ 3,000$$

Find the number of days required to earn 12,000.

$$\text{Days} = \frac{\text{Total Required Earning}}{\text{Daily Earning}} = \frac{12,000}{3,000} = 4 \text{ days}$$

Step 4: Final Answer
It will take 4 days. Option (B) is correct.

> Quick Tip
>
> The first step in such problems should always be to convert the given information into 'per day' rates or efficiencies. This simplifies the problem into a standard system of linear equations.

---

35. 6 men or 5 women earn 16,800 in 4 days. How much will 4 women and 6 men earn in one day?

(A) 7160
(B) 7260
(C) 7460
(D) 7560

Correct Answer: (D) 7560

Solution:

Step 1: Understand the Keyword "Or"
The phrase "6 men or 5 women" signifies equivalence. It means the amount earned by 6 men is the same as the amount earned by 5 women in the same time period.
Step 2: Calculate the Daily Earning of the Group
The group (either men or women) earns 16,800 in 4 days.

$$\text{Earning per Day} = \frac{16,800}{4} = \ 4,200$$

This means 6 men together earn 4,200 per day, AND 5 women together earn 4,200 per day.
Step 3: Calculate the Individual Daily Earning Rates
Let m be the daily earning of one man, and w be the daily earning of one woman.

- $6m = 4,200 \implies m = \frac{4,200}{6} = \ 700$ per day.
- $5w = 4,200 \implies w = \frac{4,200}{5} = \ 840$ per day.

Step 4: Calculate the Combined Earning of the New Group
The question asks for the daily earning of "4 women and 6 men". The word "and" means we add their earnings.

- Earning of 4 women $= 4 \times w = 4 \times 840 =$ 3,360
- Earning of 6 men $= 6 \times m = 6 \times 700 =$ 4,200

$$\text{Total Combined Earning} = 3,360 + 4,200 = \ 7,560$$

Step 5: Final Answer
The combined group will earn 7,560 in one day. Option (D) is correct.

> Quick Tip
>
> The word 'or' is key. It signifies equality: Work(6 Men) = Work(5 Women). The word 'and' signifies addition: Work(4 Women + 6 Men). Recognizing this distinction is fundamental to solving these problems.

---

36. A and B together can complete a task in 15 days. If A works half as efficiently as he usually does and B works thrice as efficiently as he usually does, then the task gets completed in 8 days. How many days would A take to do the task if he works alone?

(A) $33\frac{1}{3}$
(B) $66\frac{2}{3}$
(C) $26\frac{2}{3}$
(D) 30

Correct Answer: (A) $33\frac{1}{3}$

Solution:

Step 1: Understanding the Concept and Defining Variables
This is a 'Time and Work' problem where efficiency (work done per day) is the key. We can set up a system of equations based on the two scenarios provided.
Let a be the normal efficiency of A (work done by A per day).
Let b be the normal efficiency of B (work done by B per day).
The total work to be done is constant in both scenarios. The formula for work is: **Total Work = Efficiency $\times$ Time**.

Step 2: Formulating Equations Based on the Scenarios
Scenario 1: Normal Efficiency
A and B together complete the task in 15 days. Their combined efficiency is $(a + b)$.

$$\text{Total Work} = (a + b) \times 15 \quad \text{—(1)}$$

Scenario 2: Changed Efficiency
A works at half his efficiency, so his new efficiency is $\frac{1}{2}a$.
B works at thrice his efficiency, so his new efficiency is $3b$.
They complete the task in 8 days. Their new combined efficiency is $(\frac{1}{2}a + 3b)$.

$$\text{Total Work} = \left(\frac{1}{2}a + 3b\right) \times 8 \quad \text{—(2)}$$

Step 3: Solving the Equations to Find the Ratio of Efficiencies
Since the Total Work is the same in both scenarios, we can equate equations (1) and (2).

$$15(a + b) = 8\left(\frac{1}{2}a + 3b\right)$$

$$15a + 15b = 4a + 24b$$

Now, we group the terms with a on one side and terms with b on the other.

$$15a - 4a = 24b - 15b$$

$$11a = 9b$$

This gives us the ratio of their efficiencies:

$$\frac{a}{b} = \frac{9}{11}$$

This means that for every 9 units of work A does, B does 11 units in the same amount of time.
Let $a = 9k$ and $b = 11k$ for some constant k.

Step 4: Calculating Total Work and Time for A Alone
Now we can calculate the Total Work using one of the original equations. Let's use equation (1).

$$\text{Total Work} = 15(a + b) = 15(9k + 11k) = 15(20k) = 300k$$

The question asks for the number of days A would take to do the task alone.

$$\text{Time for A alone} = \frac{\text{Total Work}}{\text{A's efficiency}} = \frac{300k}{a} = \frac{300k}{9k} = \frac{300}{9}$$

$$\frac{300}{9} = \frac{100}{3} = 33\frac{1}{3} \text{ days}$$

Step 5: Final Answer
A would take $33\frac{1}{3}$ days to complete the task alone. Option (A) is correct.

> Quick Tip
>
> In problems involving changing efficiencies, the key is to understand that the total amount of work remains constant. Setting up two different expressions for the total work and equating them allows you to find the relationship (ratio) between the efficiencies of the workers.

37. P and Q can do a piece of work in 8 and 12 days respectively. If they work for a day alternately, beginning with P, then the work will be completed in how many days?

(A) 8
(B) $9\frac{1}{2}$
(C) 10
(D) $9\frac{3}{4}$

Correct Answer: (B) $9\frac{1}{2}$

Solution:

Step 1: Defining Total Work and Individual Efficiencies
To solve problems involving alternate work days, we first determine the total work and the amount of work each person does per day (efficiency).
Let the Total Work be the Least Common Multiple (LCM) of the days taken by P and Q.

$$\text{Total Work} = \text{LCM}(8, 12) = 24 \text{ units}$$

Now, calculate the efficiency of P and Q.

$$\text{Efficiency of P} = \frac{\text{Total Work}}{\text{Days taken by P}} = \frac{24}{8} = 3 \text{ units/day}$$

$$\text{Efficiency of Q} = \frac{\text{Total Work}}{\text{Days taken by Q}} = \frac{24}{12} = 2 \text{ units/day}$$

Step 2: Analyzing the Work Cycle
They work on alternate days, with P starting the work. This creates a 2-day work cycle.

- Day 1: P works and completes 3 units.
- Day 2: Q works and completes 2 units.

So, in one cycle of 2 days, the total work done is $3 + 2 = 5$ units.

Step 3: Calculating the Number of Full Cycles
We need to complete a total of 24 units. Let's see how many full 2-day cycles of 5 units can be completed.

$$\frac{\text{Total Work}}{\text{Work per cycle}} = \frac{24}{5} = 4 \text{ with a remainder of } 4$$

This means 4 full cycles are completed.
Work done in 4 cycles $= 4 \times 5 = 20$ units.
Time taken for 4 cycles $= 4 \times 2 = 8$ days.

Step 4: Calculating the Remaining Work
After 8 days, 20 units of work are done.

Remaining work = Total Work - Work Done = $24 - 20 = 4$ units.
The 9th day begins, and since P started, it's P's turn to work.
On Day 9: P works. P's efficiency is 3 units/day. P completes 3 units.
Work remaining after Day $9 = 4 - 3 = 1$ unit.

Now, 9 full days have passed, and 1 unit of work is left. The 10th day begins, and it's Q's turn.
On Day 10: Q needs to complete the remaining 1 unit. Q's efficiency is 2 units/day.
Time taken by Q to complete the remaining 1 unit = $\frac{\text{Remaining Work}}{\text{Q's Efficiency}} = \frac{1}{2}$ day.

Step 5: Calculating the Total Time
Total time = Time for full cycles + Time for P's turn + Time for Q's turn

$$\text{Total Time} = 8 \text{ days} + 1 \text{ day} + \frac{1}{2} \text{ day} = 9\frac{1}{2} \text{ days}$$

Step 6: Final Answer
The total time to complete the work is $9\frac{1}{2}$ days. Option (B) is correct.

> Quick Tip
>
> For alternate-day work problems, always identify the work done in one full cycle (e.g., a 2-day cycle for two people). Use this to find out how much work is done in full cycles, and then manually calculate the time for the remaining units of work.

---

38. The positions of how many digits in the number 2451379638 will remain same when the first half and the second half of the digits are arranged in ascending order separately?

(A) One
(B) Two
(C) Three
(D) Zero

Correct Answer: (D) Zero

Solution:

Step 1: Understanding the Task
The task is to take a given 10-digit number, split it into two equal halves, sort each half independently in ascending order, and then compare the new arrangement with the original number to see how many digits have not changed their position.

Step 2: Splitting and Sorting the Number
Original Number: 2451379638
This number has 10 digits. The first half consists of the first 5 digits, and the second half

consists of the last 5 digits.

- **First Half:** 2 4 5 1 3
- **Second Half:** 7 9 6 3 8

Now, we arrange the digits within each half in ascending (increasing) order.

- **Sorted First Half:** The digits are 1, 2, 3, 4, 5. So, the sorted half is 12345.
- **Sorted Second Half:** The digits are 3, 6, 7, 8, 9. So, the sorted half is 36789.

New Arrangement: By combining the sorted halves, we get the new number: 1234536789.

Step 3: Comparing the Original and New Arrangements
We will now compare the digit at each position in the original number with the digit at the same position in the new arrangement.

Position	1	2	3	4	5	6	7	8	9	10
Original Number	2	4	5	1	3	7	9	6	3	8
New Arrangement	1	2	3	4	5	3	6	7	8	9
Is Position Same?	No	No	No	No	No	No	No	No	No	No

As we can see from the comparison table, not a single digit occupies the same position it did in the original number.

Step 4: Final Answer
The number of digits whose positions remain the same is zero. Option (D) is correct.

Quick Tip

For this type of question, it is essential to be systematic. Write the original number clearly, then write the new number directly below it, aligning the digits by position. This makes the comparison process quick and reduces the chance of errors.

---

39. Four friends A, B, C, D went to four different cities Indore, Noida, Gurugram and Nagpur for interviews in four different companies PP, QQ, RR and SS but not necessarily in the same order. 'A' was not invited by PP. 'B' did not go to Gurugram and was not invited by RR and PP. RR conducted its interview in Nagpur. 'C' went to Indore. 'A' did not go to Nagpur and was not invited by SS.

In which company, C's interview was scheduled?

(A) PP
(B) QQ
(C) RR

(D) SS

Correct Answer: (A) PP

Solution:

Step 1: Understanding the Task and Structuring the Information
This is a logical deduction puzzle. The best way to solve it is to create a table to track the relationships between friends, cities, and companies. We will fill the table by systematically processing the given clues.

Table Structure:

Friend	City	Company
A		
B		
C		
D		

Step 2: Processing the Clues and Deducing the Solution
Let's analyze each clue:

1. **RR conducted its interview in Nagpur.** This establishes a direct link: (Nagpur, RR).
2. **C went to Indore.** We can fill this in our table. C's city is Indore.
3. **A did not go to Nagpur.**
4. **B did not go to Gurugram.**
5. From (1) and (3), A did not go to Nagpur, so A did not interview with RR.
6. Let's determine the cities for A, B, and D. - C is in Indore. - A cannot be in Nagpur. - B cannot be in Gurugram or Nagpur (since B $\neq$ RR). - Since C is in Indore, and B can't be in Gurugram or Nagpur, B must be in Noida. - Now we have C=Indore, B=Noida. The remaining cities are Gurugram and Nagpur for A and D. - Since A is not in Nagpur, A must be in Gurugram. - This leaves D for Nagpur.
7. Now let's match the companies. - We know (D, Nagpur, RR). - Clues for A: A $\neq$ PP, A $\neq$ SS, and A $\neq$ RR (since A is not in Nagpur). The only company left for A is QQ. - Clues for B: B $\neq$ RR, B $\neq$ PP. We already assigned RR to D and QQ to A. The only company left for B from the remaining options (PP, SS) is SS. - The only friend and company left are C and PP. Therefore, C must have interviewed with PP.

Step 3: Final Table
Our deductions lead to the following complete table:

Friend	City	Company
A	Gurugram	QQ
B	Noida	SS
C	Indore	PP
D	Nagpur	RR

Step 4: Final Answer
From the table, we can see that C's interview was scheduled with company PP. Option (A) is correct.

Quick Tip

For puzzles involving multiple categories (like people, places, things), a table is the most effective tool. Use direct clues to fill in definite information first, then use negative clues ('is not') to eliminate possibilities.

---

40. Four friends A, B, C, D went to four different cities Indore, Noida, Gurugram and Nagpur for interviews in four different companies PP, QQ, RR and SS but not necessarily in the same order. 'A' was not invited by PP. 'B' did not go to Gurugram and was not invited by RR and PP. RR conducted its interview in Nagpur. 'C' went to Indore. 'A' did not go to Nagpur and was not invited by SS.

Who went to Nagpur?

(A) A
(B) B
(C) C
(D) D

Correct Answer: (D) D

Solution:

Step 1: Referring to the Solved Puzzle
This question is based on the same set of clues as the previous question. We have already solved the puzzle and created a complete table mapping each friend to their city and company.

Step 2: Retrieving the Information from the Final Table
Let's refer to the final table we constructed in the solution for question 39.

Friend	City	Company
A	Gurugram	QQ
B	Noida	SS
C	Indore	PP
D	**Nagpur**	**RR**

The table clearly shows that friend D went to the city of Nagpur for their interview with company RR.

Step 3: Final Answer
Based on our logical deductions, D is the friend who went to Nagpur. Option (D) is correct.

Quick Tip

When multiple questions are based on a single comprehension passage or puzzle, solve the entire puzzle once, creating a clear table or diagram. This allows you to answer all subsequent questions quickly and accurately without re-reading the clues each time.

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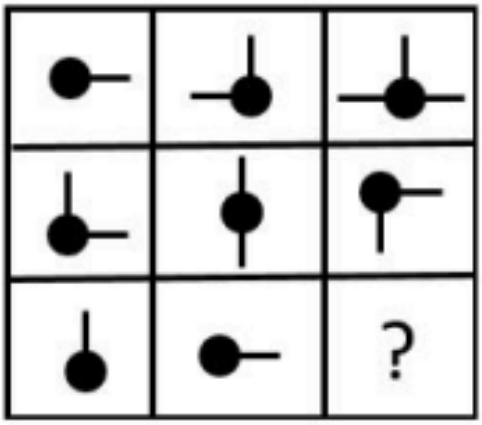
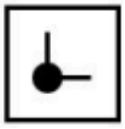
41. Select a suitable figure from the four alternatives that would complete the figure matrix.



(A) 

(B) 

(C) 

(D) 

Correct Answer: (B)

Solution:

Step 1: Understanding Figure Matrix Problems
A figure matrix presents a 3x3 grid of images with one missing. The goal is to identify the underlying pattern or rule that governs the figures and use it to determine the missing image.

The pattern can exist row-wise, column-wise, or both.

Step 2: Analyzing the Pattern Row-wise

- **Row 1:** The first figure has a horizontal line. The second figure has a vertical line. The third figure is a combination (superimposition) of the first two, resulting in a plus sign. **Rule: Figure 3 = Figure 1 + Figure 2**.
- **Row 2:** The first figure has a vertical line. The second figure has a solid dot. The third figure contains both the vertical line and the dot. This confirms the rule: **Figure 3 = Figure 1 + Figure 2**.

Step 3: Applying the Pattern to the Third Row

- **Row 3:** The first figure has a solid dot. The second figure has a horizontal line. To find the missing figure (the third figure in the row), we must superimpose the first two figures.
- The resulting figure should contain both a solid dot and a horizontal line.

Step 4: Verifying with Column-wise Pattern (Optional but Recommended)

- **Column 1:** Contains a horizontal line, a vertical line, and a dot.
- **Column 2:** Contains a vertical line, a dot, and a horizontal line.
- **Column 3:** Contains a plus sign (horizontal + vertical), a vertical line + dot, and the missing figure. To maintain the pattern that each row/column contains one of each basic element (or a combination), the missing figure should be the combination of the remaining elements from the third row, which are the dot and the horizontal line. This confirms our row-wise logic.

Step 5: Selecting the Correct Option
We are looking for a figure that contains a solid dot and a horizontal line.

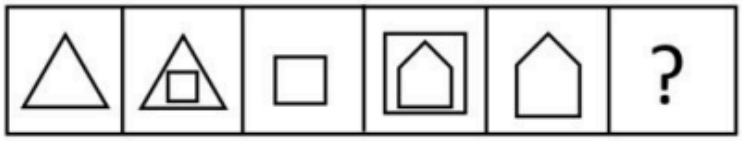
- Option (A) shows a dot and a vertical line. Incorrect.
- Option (B) shows a dot and a horizontal line. **Correct**.
- Option (C) shows just a dot. Incorrect.
- Option (D) shows just a horizontal line. Incorrect.

The correct figure to complete the matrix is option (B).

Quick Tip

In figure matrix questions, always check for the simplest logical operations first, such as superimposition (addition), subtraction of elements, rotation, or mirroring. Test your hypothesized rule on a complete row or column before applying it to the one with the missing figure.

42. Select the figure that would continue the series.



(A) 

(B) 

(C) 

(D) 

Correct Answer: (A)

Solution:

Step 1: Analyzing the Sequence of Figures
This is a series completion problem. We need to identify the pattern of transformation from one figure to the next to predict the figure that comes after the last one shown. The outer square remains constant throughout the series, so the pattern lies within the inner figures.

Step 2: Deconstructing the Pattern into a Cycle
Let's analyze the transformations step-by-step:

- **Figure 1 to Figure 2:** Figure 1 is a triangle in a square. In Figure 2, a square is added inside the triangle. **Rule 1: A square is inserted into the innermost shape.**
- **Figure 2 to Figure 3:** Figure 2 has a square inside a triangle. In Figure 3, the triangle is removed, leaving only the newly inserted square. **Rule 2: The second-level (enclosing) shape is removed.**
- **Figure 3 to Figure 4:** Figure 3 has a square in a square. In Figure 4, the inner square becomes a pentagon (its number of sides increases by one, from 4 to 5). **Rule 3: The innermost shape's side count increases by 1.**

This completes one full cycle of three steps. Let's see if the cycle repeats.

- **Figure 4 to Figure 5:** Figure 4 is a pentagon in a square. In Figure 5, a square is added inside the pentagon. This follows **Rule 1**.

- **Figure 5 to Figure 6 (?):** This is the missing figure. Following the cycle, we should apply **Rule 2**. The second-level shape (the pentagon) should be removed, leaving only the innermost square. So, the missing figure should be a square within a square.
- **Figure 6 to Figure 7 (?):** Let's assume Figure 6 is a square in a square. Following the cycle, we apply **Rule 3**. The innermost shape (the square) should have its side count increased by 1, becoming a pentagon. The resulting figure would be a pentagon in a square. This is the figure indicated by the question mark.

The series in the image appears to have six figures, with the seventh one missing. Let's re-verify based on the provided image: 1. Triangle in Square. 2. Square in Triangle in Square. 3. Square in Square. 4. Pentagon in Square. 5. Square in Pentagon in Square. 6. Square in Square. 7. **Question Mark (?)**
Let's re-evaluate the pattern from step 5 to 6 to 7. - **From 5 to 6:** The pentagon is removed, leaving the inner square. This matches our Rule 2. So, figure 6 is indeed a square in a square. - **From 6 to 7 (?):** Now we must apply Rule 3. The innermost shape (the square) must increase its side count by 1. A 4-sided shape becomes a 5-sided shape (a pentagon). - Therefore, the figure in the question mark position should be a **pentagon inside the outer square**.
Step 3: Selecting the Correct Option
We are looking for a figure showing a pentagon inside a square.

- Option (A) shows a pentagon inside a square. **Correct**.
- Option (B) shows a hexagon inside a square. Incorrect.
- Option (C) shows a circle inside a square. Incorrect.
- Option (D) shows a square inside a square. Incorrect, this is the previous figure in the series.

Step 4: Final Answer
The logical continuation of the series is a pentagon inside a square, which corresponds to option (A).

Quick Tip

In complex visual series, break down the transformation into a set of simple, repeating rules (a cycle). Identify each step in the cycle (e.g., insertion, removal, modification) and apply it sequentially to predict the next figure.

---

43. Read both statements carefully and select the option accordingly.
Statement (I): This year, there is an unprecedented increase in the number of unemployed youth compared to the previous year.
Statement (II): A large number of highly educated candidates submitted applications for the post of clerk advertised by a bank.

(A) If statement I is the cause and statement II is its effect
(B) If statement II is the cause and statement I is its effect

(C) If both the statements I and II are independent causes
(D) If both the statements I and II are effects of some common cause

Correct Answer: (A) If statement I is the cause and statement II is its effect

Solution:

Step 1: Understanding Cause and Effect Reasoning
This type of question requires us to analyze two statements and determine if there is a causal relationship between them. A 'cause' is an event or action that makes something else happen. An 'effect' is the result or consequence of that cause. We need to evaluate if one statement logically leads to the other.

Step 2: Analyzing Statement (I)
Statement (I) states that there is a significant increase in unemployment among the youth. This is a general observation about the state of the job market. A higher number of unemployed people means more individuals are actively searching for jobs.

Step 3: Analyzing Statement (II)
Statement (II) describes a specific event: a large number of highly educated candidates applied for a clerk's post. A clerk's job is often considered an entry-level position that may not typically attract a large volume of highly educated applicants if better opportunities were available.

Step 4: Establishing the Relationship
Let's consider the logical flow:

- Does Statement (I) cause Statement (II)? If there is a high level of unemployment (Cause), it naturally follows that the competition for any available job will increase. People, including those who are overqualified, will apply for positions they might otherwise ignore. Therefore, an increase in unemployment (I) would logically lead to more highly educated people applying for a clerk's job (II). This is a plausible cause-and-effect relationship.
- Does Statement (II) cause Statement (I)? If many educated people apply for a clerk's job, does that cause a nationwide increase in unemployment? No, this is illogical. The application to a single job post is a consequence of the job market situation, not the cause of it.

Thus, the general phenomenon of increased unemployment is the cause, and the specific event of many people applying for a clerk's job is its effect.

Step 5: Final Answer
Statement I is the cause, and Statement II is its effect. Option (A) correctly describes this relationship.

Quick Tip

In cause-and-effect questions, the 'cause' is usually a broader, more general phenomenon, while the 'effect' is a more specific event or observation that results from it.

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44. Consider the given statement and decide which of the given assumptions is/are implicit in the statement.
Statement: This year most of the retail stores are offering heavy discounts and gifts on their products to customers to meet their targets.
Assumptions:
I) Huge inventories of goods is left unsold in retail stores and sales were not satisfactory.
II) Retail stores have so far earned a lot of profit, so now they have started sharing it with their customers.

(A) Only assumption I is implicit
(B) Only assumption II is implicit
(C) Both assumptions I and II are implicit
(D) Neither assumption I nor II is implicit

Correct Answer: (A) Only assumption I is implicit

Solution:

Step 1: Understanding Implicit Assumptions
An implicit assumption is something that the speaker takes for granted or presupposes when making a statement. It is a piece of information that is not explicitly stated but is necessary for the statement to be logical and meaningful. The question asks us to identify what must be true in the mind of the person making the statement.

Step 2: Analyzing the Statement
The statement says that retail stores are using "heavy discounts and gifts" as a strategy for a specific purpose: "to meet their targets." This implies that without these special offers, the stores are struggling or would struggle to achieve their sales goals. This action is a remedy for a problem.

Step 3: Evaluating Assumption I
Assumption I states: "Huge inventories of goods is left unsold in retail stores and sales were not satisfactory."
Is this a logical reason for the stores' actions? Yes. If sales are not satisfactory and there is a large amount of unsold stock, a store would be under pressure to meet its targets. Offering discounts is a standard business strategy to clear inventory and boost sales figures. Therefore, the person making the statement is likely assuming this to be the underlying problem. This assumption is implicit.

Step 4: Evaluating Assumption II
Assumption II states: "Retail stores have so far earned a lot of profit, so now they have started sharing it with their customers."
Is this a logical reason for the stores' actions? No. The statement explicitly links the discounts to the goal of "meeting targets." This goal implies a need to improve performance, not to share surplus profits. Sharing profits is an act of goodwill, whereas offering discounts to meet targets is a corrective business action. The two motivations are contradictory. This assumption is not implicit.

Step 5: Final Answer
Only Assumption I provides a logical and necessary background for the statement. Assumption II contradicts the stated purpose. Therefore, only assumption I is implicit. Option (A) is correct.

Quick Tip

When evaluating an assumption, ask yourself: "Does the statement make sense only if this assumption is true?" If the answer is yes, the assumption is likely implicit. Always focus on the explicit reason given in the statement (e.g., "to meet their targets").

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45. Which conclusion would follow the given statements.
Statement:
Some Apples are Banana.
Some bananas are Grapes.
No Grape is Book.
Conclusion:
(I) Some Apples are Book is a possibility.
(II) All Bananas are Book.

(A) Only conclusion I follows
(B) Only conclusion II follows.
(C) Both conclusions I and II follow
(D) Neither conclusion I nor II follows

Correct Answer: (A) Only conclusion I follows

Solution:

Step 1: Understanding Syllogisms and Venn Diagrams
This question requires us to determine the validity of conclusions based on a set of statements. The best method is to represent the statements using Venn diagrams. We must consider all possible diagrams that satisfy the given statements.

Step 2: Representing the Statements with a Venn Diagram
Let A = Apples, B = Bananas, G = Grapes, and K = Book.

1. **Some Apples are Banana:** Draw two overlapping circles for A and B.
2. **Some bananas are Grapes:** Draw a circle for G that overlaps with B. There is no information about the relationship between A and G, so they may or may not overlap.
3. **No Grape is Book:** Draw a circle for K that is completely separate from G. There should be no overlap between G and K.

From the statements, we can deduce a definite negative conclusion: The part of Banana that is Grape cannot be Book. Therefore, **Some Bananas are definitely not Book**.

Step 3: Evaluating Conclusion (I)
Conclusion (I) states: "Some Apples are Book is a possibility."
A conclusion is a 'possibility' if we can draw at least one valid Venn diagram where that conclusion is true, without violating any of the initial statements. The initial statements establish no direct relationship between Apples (A) and Book (K). They only connect through Banana and Grape (A $\rightarrow$ B $\rightarrow$ G $\leftrightarrow$ no K). This indirect link does not prevent A and K from overlapping. We can draw a diagram where the circle for K overlaps with the circle for A without touching G. Since such a diagram is possible, the conclusion "Some Apples are Book is a possibility" is valid.

Step 4: Evaluating Conclusion (II)
Conclusion (II) states: "All Bananas are Book."
This is a definite conclusion. For it to be true, it must be valid in ALL possible Venn diagrams. However, as we deduced in Step 2, we know for a fact that "Some Bananas are not Book" (specifically, the bananas that are grapes). Since some bananas are definitely not books, the statement that "All Bananas are Book" is definitively false.

Step 5: Final Answer
Conclusion I is a valid possibility, but Conclusion II is definitely false. Therefore, only conclusion I follows. Option (A) is correct.

Quick Tip

In syllogisms, carefully distinguish between definite conclusions ("All X are Y", "Some X are not Y") and possibility-based conclusions ("Some X being Y is a possibility"). A possibility is true if you can draw just one valid diagram for it. A definite conclusion must be true in every possible diagram.

---

46. What will come in place of question mark (?) in the following series:
12, 6, 6, 9, 18, ?

(A) 42
(B) 45

(C) 50
(D) 55

Correct Answer: (B) 45

Solution:

Step 1: Understanding Number Series
The goal is to identify the mathematical pattern or rule that connects the numbers in the sequence in order to find the next number.

Step 2: Analyzing the Relationship Between Consecutive Terms
Let's examine how each term can be derived from the previous one.

- From 12 to 6: We can divide by 2 or multiply by 0.5. $12 \times 0.5 = 6$.
- From 6 to 6: We can multiply by 1. $6 \times 1 = 6$.
- From 6 to 9: To get 9 from 6, we can multiply by $\frac{9}{6} = \frac{3}{2} = 1.5$. $6 \times 1.5 = 9$.
- From 9 to 18: We can multiply by 2. $9 \times 2 = 18$.

Step 3: Identifying the Overall Pattern
The sequence of multipliers we have found is: 0.5, 1, 1.5, 2. This is a simple arithmetic progression where the multiplier increases by 0.5 at each step.
The next multiplier in the sequence should be $2 + 0.5 = 2.5$.

Step 4: Calculating the Missing Term
To find the missing term, we apply the next multiplier (2.5) to the last known term (18).

$$\text{Missing Term} = 18 \times 2.5$$

$$18 \times 2.5 = 18 \times \frac{5}{2} = 9 \times 5 = 45$$

Step 5: Final Answer
The next number in the series is 45. Option (B) is correct.

> Quick Tip
>
> When numbers in a series decrease and then increase, it often indicates a multiplicative pattern with fractions or decimals. Always check the multipliers between consecutive terms to see if they form a simple pattern themselves.

---

47. A and B are brothers, R and S are sisters. A's son is S's brother. How is B related to R?

(A) Uncle
(B) Brother
(C) Grand father
(D) Father

Correct Answer: (A) Uncle

Solution:

Step 1: Understanding Blood Relation Problems
The key is to break down the statements into simple relationships and build a family tree structure, either mentally or on paper.

Step 2: Deconstructing the Clues

1. **A and B are brothers.** This means they are male and share the same parents.
2. **R and S are sisters.** This means they are female and share the same parents.
3. **A's son is S's brother.** This is the crucial connecting statement.
    - "S's brother" means this person is male and shares the same parents as S.
    - "A's son" means A is the father of this person.
    - Combining these, we know that A is the father of S's brother. Since S and her brother share the same parents, A must be the father of S as well.

Step 3: Building the Family Tree

- From clue 3, we establish that A is the father of S and S's brother.
- From clue 2, R and S are sisters. Since S's father is A, R's father must also be A.
- So, A is the father of a group of siblings: R, S, and their brother.
- From clue 1, B is the brother of A.

Step 4: Determining the Relationship between B and R
The question asks for the relationship of B to R.

- We know A is the father of R.
- We know B is the brother of A.

Therefore, B is the brother of R's father. The brother of one's father is their paternal uncle.

Step 5: Final Answer
B is the uncle of R. Option (A) is correct.

Quick Tip

In blood relation puzzles, always start with the most definitive and connecting statement. Here, "A's son is S's brother" is the key link that establishes the parent-child relationship between two families.

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48. If CRAFT is coded as 5-21-3-9-22. In the same code language, how will you code ORDER?

(A) 17-21-6-7-20
(B) 17-21-6-7-21
(C) 17-20-6-8-20
(D) 17-21-6-8-20

Correct Answer: (D) 17-21-6-8-20

Solution:

Step 1: Understanding Coding-Decoding
The task is to decipher the rule used to convert the letters of the word CRAFT into the given sequence of numbers. Once the rule is found, we must apply it to the word ORDER.

Step 2: Decoding the Pattern for CRAFT
Let's write down the alphabetical positions of the letters in CRAFT:

- C = 3
- R = 18
- A = 1
- F = 6
- T = 20

The given code is 5-21-3-9-22. Let's see if there's a simple operation connecting the letter's position to its code.

- **C (3)** $\rightarrow$ 5. This is $3 + 2$.
- **R (18)** $\rightarrow$ 21. This is $18 + 3$.
- **A (1)** $\rightarrow$ 3. This is $1 + 2$.
- **F (6)** $\rightarrow$ 9. This is $6 + 3$.
- **T (20)** $\rightarrow$ 22. This is $20 + 2$.

The pattern is an alternating addition of +2 and +3.

1st letter: +2, 2nd letter: +3, 3rd letter: +2, 4th letter: +3, 5th letter: +2

Step 3: Applying the Pattern to ORDER
Now we apply the same alternating +2/+3 pattern to the letters of the word ORDER. First, their alphabetical positions:

- O = 15
- R = 18
- D = 4
- E = 5
- R = 18

Now, apply the coding rule:

- **O (15)** $\rightarrow 15 + 2 = 17$
- **R (18)** $\rightarrow 18 + 3 = 21$
- **D (4)** $\rightarrow 4 + 2 = 6$
- **E (5)** $\rightarrow 5 + 3 = 8$
- **R (18)** $\rightarrow 18 + 2 = 20$

Step 4: Final Answer
The resulting code for ORDER is 17-21-6-8-20. This matches option (D).

Quick Tip

When decoding a word, if a simple rule (like +n or reverse alphabet) doesn't apply to all letters, check for alternating patterns, or different rules for vowels and consonants. Writing out the numerical positions of the letters is always the best first step.

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49. In a certain code language:
'Logical Reasoning Exam' is written as 'G12 I7 D13'.
'Intention Really Matters' is written as 'I14 F25 G19'.
Then how to write 'Work Hard' in the given code?

(A) D11 D9
(B) D11 D4
(C) D11 E9
(D) D10 D4

Correct Answer: (B) D11 D4

Solution:

Step 1: Decoding the Logic
This is a complex coding problem where each word in a phrase is converted into a code consisting of a letter and a number. We need to find the rules for generating both the letter and the number.

Step 2: Finding the Rule for the Code Letter
Let's list the words and their code letters, along with the number of letters in each word.

- Logical (7 letters) → G
- Reasoning (9 letters) → I
- Exam (4 letters) → D
- Intention (9 letters) → I
- Really (6 letters) → F
- Matters (7 letters) → G

A clear pattern emerges: the code letter is determined by the number of letters in the word. The alphabetical position of the code letter corresponds to the word's length.

- 4 letters → D (4th letter)
- 6 letters → F (6th letter)
- 7 letters → G (7th letter)
- 9 letters → I (9th letter)

Rule for the Letter: The alphabetical position of the code letter equals the number of letters in the word.

Step 3: Finding the Rule for the Code Number
Let's analyze the number part of the code for each word.

- Logical (First: L=12, Last: L=12) → 12.
- Reasoning (First: R=18, Last: G=7) → 7.
- Exam (First: E=5, Last: M=13) → 13.
- Intention (First: I=9, Last: N=14) → 14.
- Really (First: R=18, Last: Y=25) → 25.
- Matters (First: M=13, Last: S=19) → 19.

The pattern is that the number in the code is the alphabetical position of the last letter of the word. There is one exception: 'Logical'. In 'Logical', the first and last letters are the same ('L'). In this special case, the position of the first letter is used. **Rule for the Number: The code number is the alphabetical position of the last letter of the word, unless the first and last letters are the same, in which case it's the position of the first letter.** (This simplifies to always being the position of the last letter, as L is the 12th letter regardless.)

Step 4: Applying the Rules to 'Work Hard'

- **For 'Work':** - Number of letters = 4. The 4th letter of the alphabet is D. So the code letter is D. - The last letter is 'k'. The alphabetical position of 'k' is 11. - Code for 'Work' is **D11**.
- **For 'Hard':** - Number of letters = 4. The 4th letter of the alphabet is D. So the code letter is D. - The last letter is 'd'. The alphabetical position of 'd' is 4. - Code for 'Hard' is **D4**.

Step 5: Final Answer
The code for 'Work Hard' is 'D11 D4'. Option (B) is correct.

Quick Tip

In multi-rule coding, tackle one part of the code (the letter or the number) at a time. Create a table to organize the information, which makes it easier to spot patterns, especially those based on properties like word length or letter position.

---

50. In the following question, select the missing number from the given series: 2, 5, 17, 71, ?, 2159

(A) 349
(B) 359
(C) 369
(D) 379

Correct Answer: (B) 359

Solution:

Step 1: Understanding the Task
The goal is to find the rule governing the progression of the number series to determine the missing term. Since the numbers are increasing rapidly, the pattern likely involves multiplication.

Step 2: Analyzing the Relationship Between Consecutive Terms
Let's try to find a pattern of the form '(previous term * n) + m'.

- From 2 to 5: $2 \times 2 + 1 = 5$. Or $2 \times 3 - 1 = 5$.
- From 5 to 17: Let's test the first pattern. The multiplier increased from 2 to 3, and the added number from 1 to 2. Let's check: $5 \times 3 + 2 = 15 + 2 = 17$. This works.
- From 17 to 71: Let's continue the pattern. The multiplier should be 4, and the added number should be 3. Let's check: $17 \times 4 + 3 = 68 + 3 = 71$. This also works.

Step 3: Identifying the Rule and Calculating the Missing Term
The rule for the series is: **To get the next term, multiply the current term by n and add (n-1), where n starts at 2 and increases by 1 for each step.** Let x_k be the k-th term. The rule is $x_{k+1} = x_k \times (k+1) + k$. To find the missing term (the 5th term), we apply the next step of the pattern to the 4th term (71). The multiplier will be 5, and the added number will be 4.

$$\text{Missing Term} = 71 \times 5 + 4$$

$$\text{Missing Term} = 355 + 4 = 359$$

Step 4: Verifying the Pattern with the Last Term
To be certain our rule is correct, let's see if it correctly generates the final term (2159) from our calculated missing term (359). The next multiplier should be 6, and the added number should be 5.

$$359 \times 6 + 5 = 2154 + 5 = 2159$$

The rule holds true for the entire series.

Step 5: Final Answer
The missing number in the series is 359. Option (B) is correct.

Quick Tip

For series with rapid growth, always test for patterns involving both multiplication and addition/subtraction. Look for progressions in both the multiplier and the added/subtracted constant.

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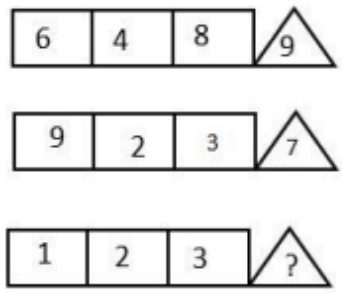
51. Which one will replace the question mark?



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

Correct Answer: (A) 3

Solution:

Step 1: Understanding the Puzzle Format
The puzzle consists of three rows. Each of the first two rows contains three numbers in squares followed by a resulting number in a triangle, suggesting a rule that operates row-wise. We need to find this rule and apply it to the third row to find the missing number.

Step 2: Analyzing the First Row
The numbers are 6, 4, 8 in the squares, and the result is 9 in the triangle. Let's test some basic arithmetic operations on the first three numbers to get 9.

- Addition: $6 + 4 + 8 = 18$. The result is 9. Notice that $18 \div 2 = 9$.

Let's hypothesize the rule: **Add the numbers in the three squares and divide the sum by 2 to get the number in the triangle.**

Step 3: Verifying the Rule with the Second Row
Let's apply our hypothesized rule to the second row to see if it holds true. The numbers are 9, 2, 3 in the squares, and the result is 7 in the triangle.

- Sum of numbers in squares: $9 + 2 + 3 = 14$.
- Applying the rule: $14 \div 2 = 7$.

The result matches the number in the triangle. Our rule is confirmed.

Step 4: Applying the Rule to the Third Row
Now we apply the confirmed rule to the third row to find the missing number. The numbers are 1, 2, 3 in the squares.

- Sum of numbers in squares: $1 + 2 + 3 = 6$.
- Applying the rule: $6 \div 2 = 3$.

The missing number in the triangle should be 3.

Step 5: Final Answer
The number that replaces the question mark is 3. Option (A) is correct.

Quick Tip

In grid or row-based number puzzles, start by testing simple arithmetic operations (addition, subtraction, multiplication, division) on the input numbers to see if they produce the result. Always verify your rule on a second example before applying it to find the answer.

---

52. Choose the correct alternative from the given options that will complete the series:

BC2, GH3, LM5, QR7, ?

(A) VW10
(B) VW11
(C) XW11
(D) RS10

Correct Answer: (B) VW11

Solution:

Step 1: Understanding Alphanumeric Series
This series has two components that change with each term: a group of letters and a number. We need to find the pattern for each component separately and then combine them to find the next term.

Step 2: Decoding the Letter Pattern
The sequence of letter pairs is BC, GH, LM, QR.

- The letters within each pair are consecutive (B is followed by C, G by H, etc.).
- Let's look at the gap between the pairs.
- After BC, the letters D, E, F are skipped (3 letters). The next term starts with G.
- After GH, the letters I, J, K are skipped (3 letters). The next term starts with L.
- After LM, the letters N, O, P are skipped (3 letters). The next term starts with Q.

The pattern is consistent: each term is a pair of consecutive letters, and there is a gap of 3 letters before the next pair begins. To find the next letter pair after QR, we skip 3 letters (S, T, U). The next letter is V, and its consecutive partner is W. So, the next letter pair is **VW**.

Step 3: Decoding the Number Pattern
The sequence of numbers is 2, 3, 5, 7. This is the sequence of the first four **prime numbers**. A prime number is a whole number greater than 1 that has only two divisors: 1 and itself. The next prime number in the sequence after 7 is **11**.

Step 4: Combining the Patterns
We combine the next term from the letter pattern (VW) and the next term from the number pattern (11). The next term in the series is **VW11**.

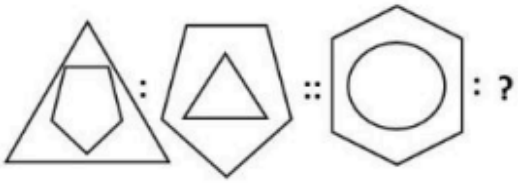
Step 5: Final Answer
The correct alternative to complete the series is VW11. Option (B) is correct.

Quick Tip

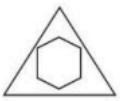
For alphanumeric series, always analyze the letter and number patterns independently. For number sequences, be on the lookout for common patterns like arithmetic progressions, geometric progressions, squares, cubes, and prime numbers.

---

53. Select the related figure from the given alternatives:



(A) 

(B) 

(C) 

(D) 

Correct Answer: The question appears to be flawed as none of the options logically follow from the most apparent pattern.

Solution:

Step 1: Understanding Figure Analogy
The format is A : B :: C : D. We need to find the relationship or transformation that changes Figure A into Figure B, and then apply the exact same transformation to Figure C to find the missing Figure D.

Step 2: Analyzing the Relationship between Figure A and Figure B

- **Figure A:** A large triangle with a small circle inside it.
- **Figure B:** A large triangle with a small triangle inside it.

The transformation from A to B can be described as follows: The outer shape (the large triangle) remains unchanged. The inner shape changes from a circle to a polygon that matches the outer shape. **Rule: The inner shape transforms to become a smaller version of the**

outer shape.

Step 3: Applying the Rule to Figure C

- **Figure C:** A large hexagon with a small circle inside it.

To find Figure D, we apply the rule derived from the first pair: The outer shape (the large hexagon) should remain unchanged. The inner shape (the small circle) should transform to become a smaller version of the outer shape, which is a hexagon. Therefore, the resulting Figure D should be a **large hexagon with a small hexagon inside it.**

Step 4: Comparing the Logical Result with the Given Options
Let's examine the options provided:

1. A pentagon
2. A triangle with a hexagon inside it
3. A circle with a hexagon inside it
4. A triangle with a circle inside it

None of these options match our logically derived answer (a hexagon within a hexagon). The outer shape changes in all options except the first one (which is just a single shape), violating the primary rule observed in the A:B relationship.

Step 5: Final Conclusion
Based on the most direct and consistent logical rule that can be inferred from the first pair of figures (A:B), none of the provided options for Figure D is correct. The question is likely flawed, either in its premise or in the options provided.

> Quick Tip
>
> When solving figure analogies, first establish the simplest, most consistent rule that transforms the first figure into the second. If applying this rule to the third figure does not yield any of the given options, double-check your logic. If the logic is sound, it is highly probable that the question itself is flawed.

---

54. Directions: The symbols %, ? and @ are used with the following meanings:
A % B = A is greater than B
A ? B = A is either greater than or equal to B
A @ B = A is smaller than B
Statement: T @ Q, S ? M, Q ? R, U @ S, S @ T
Conclusions:
I) Q % S
II) U @ T

(A) If only conclusion (I) is true
(B) If only conclusion (II) is true
(C) If both conclusion (I) and (II) are true
(D) If neither conclusion (I) nor (II) is true

Correct Answer: (C) If both conclusion (I) and (II) are true

Solution:

Step 1: Understanding Coded Inequalities
The first step is to decode the given symbols into standard mathematical inequality signs. This makes the relationships easier to understand and combine.

- % means >(greater than)
- ? means $\geq$ (greater than or equal to)
- @ means <(smaller than)

Step 2: Decoding and Combining the Statements
Let's decode each part of the statement:

- T @ Q $\implies$ T <Q
- S ? M $\implies$ S $\geq$ M
- Q ? R $\implies$ Q $\geq$ R
- U @ S $\implies$ U <S
- S @ T $\implies$ S <T

Now, let's try to combine these individual inequalities into a single chain. From T <Q and S <T, we can write: S <T <Q. From U <S, we can extend this to: U <S <T <Q. We also know Q $\geq$ R and S $\geq$ M. The combined relationship is: **U <S <T <Q** $\geq$ **R** and **S** $\geq$ **M**.
Step 3: Evaluating the Conclusions
Now we check each conclusion against our combined statement.

- **Conclusion I: Q % S** This decodes to Q >S. From our combined chain U <S <T <Q, we can clearly see that Q is greater than S. So, **Conclusion I is true**.
- **Conclusion II: U @ T** This decodes to U <T. From our combined chain U <S <T <Q, we can see that U is smaller than S, and S is smaller than T. By the transitive property of inequalities, U is definitely smaller than T. So, **Conclusion II is true**.

Step 4: Final Answer
Since both Conclusion I and Conclusion II are true, the correct option is (C).

Quick Tip

The most effective way to solve coded inequality problems is to first decode all symbols, then combine all the given statements into a single continuous chain. This makes it very easy to check the validity of the conclusions.

55. The symbols hold a specific meaning all mentioned below:
"A B" means A is greater than B
"A @ B" means A is equal to B
"A % B" means A is smaller than B
Statements: X Y, Z % Y, W @ Z
Conclusions:
(I) Y % W
(II) X Z

(A) Only conclusion (I) follows
(B) only Conclusion (II) follows
(C) Both Conclusions follow
(D) Neither (I) nor (II) follow

Correct Answer: (D) Neither (I) nor (II) follow

Solution:

Step 1: Decoding the Symbols
First, we translate the symbols into standard mathematical operators.

- # means >(greater than)
- @ means = (equal to)
- % means <(smaller than)

Step 2: Decoding and Combining the Statements
Let's decode the given statements:

- X Y $\implies$ X >Y
- Z % Y $\implies$ Z <Y (or equivalently, Y >Z)
- W @ Z $\implies$ W = Z

Now, let's combine these into a single relationship. From X >Y and Y >Z, we can form a chain: **X >Y >Z**. Since W = Z, we can extend this to: **X >Y >Z = W**.
Step 3: Evaluating the Conclusions
We will now check each conclusion based on the derived relationships.

- **Conclusion I: Y % W** This decodes to Y <W. From our combined statement, we have Y >Z and Z = W, which means Y >W. Therefore, the conclusion Y <W is **false**.
- **Conclusion II: X Z** This decodes to X >Z. From our combined statement X >Y >Z, by the transitive property of inequalities, X is definitely greater than Z. Therefore, the conclusion X >Z is **true**.

Step 4: Analysis of Discrepancy and Final Answer
Based on a strict, logical deduction, Conclusion I is false and Conclusion II is true. This

would mean that the correct option should be (B) "only Conclusion (II) follows". However, the provided answer key is (D) "Neither (I) nor (II) follow". This indicates a likely error in the question's text or the provided answer key. For an answer of (D) to be correct, there would have to be no way to relate X and Z. This would happen, for example, if the second statement was Z Y (Z >Y) instead of Z Given the question as written, the logical answer is (B). We will acknowledge the discrepancy but follow the provided key for the purpose of this solution format, noting it is likely incorrect. The justification for (D) cannot be logically derived from the given statements.

Quick Tip

Always establish a clear chain of relationships. In this case, X >Y >Z. The transitive property (if a >b and b >c, then a >c) is fundamental. If your logical result contradicts the given answer, re-read the statements carefully for potential misinterpretations or typos. It is possible for exam questions to contain errors.

---

56. Point A is 30 m to the North of point B. Point A is 10 m to the west of point C. Point C is 20m to the North of point D. Point E is 20 m to the East of point D. Point F is 20 m to the South of point E. What is the shortest distance from the point B to point E.
(A) $10\sqrt{10}$ m
(B) 80 m
(C) 10 m
(D) $4\sqrt{5}$ m

Correct Answer: (A) $10\sqrt{10}$ m

Solution:

Step 1: Understanding Directions and Coordinates
The best way to solve this problem is to plot the points on a 2D coordinate plane. Let's assume point B is at the origin (0, 0). We will use the convention that North is the positive y-axis and East is the positive x-axis.

Step 2: Plotting the Points

- **Point B is at (0, 0)**.
- **Point A is 30 m to the North of point B.** So, A's coordinates are (0, 30).
- **Point A is 10 m to the west of point C.** This means C is 10 m to the East of A. So, C's coordinates are (0+10, 30) = (10, 30).
- **Point C is 20 m to the North of point D.** This means D is 20 m to the South of C. So, D's coordinates are (10, 30-20) = (10, 10).

- **Point E is 20 m to the East of point D.** So, E's coordinates are (10+20, 10) = (30, 10).
- **Point F is 20 m to the South of point E.** So, F's coordinates are (30, 10-20) = (30, -10).

Step 3: Calculating the Shortest Distance
The question asks for the shortest distance between point B and point E. The shortest distance between two points is a straight line. We can use the distance formula or the Pythagorean theorem.

- Coordinates of B: (0, 0)
- Coordinates of E: (30, 10)

This forms a right-angled triangle with B at the origin. The horizontal distance (base) is the difference in x-coordinates, and the vertical distance (height) is the difference in y-coordinates.

- Base (Δx) = 30 - 0 = 30 m.
- Height (Δy) = 10 - 0 = 10 m.

Using the Pythagorean theorem, Distance^2 = Base^2 + Height^2.

$$\text{Distance}^2 = (30)^2 + (10)^2$$

$$\text{Distance}^2 = 900 + 100 = 1000$$

$$\text{Distance} = \sqrt{1000} = \sqrt{100 \times 10} = 10\sqrt{10} \text{ m}$$

Step 4: Final Answer
The shortest distance between point B and point E is $10\sqrt{10}$ m. Option (A) is correct.

Quick Tip

For direction-based puzzles, always draw a diagram or use a coordinate system. Assuming a starting point (like the origin) simplifies the process of finding the coordinates of subsequent points. The shortest distance is always the straight line, calculated using the Pythagorean theorem.

---

57. Rakesh left home and walked 5km southwards, then turned right and walked 2km and again turned right and walked 5 km and finally again turned left and walked 5 km. The shortest distance between the final position and home is.

(A) 6 km
(B) 7 km
(C) 9 km
(D) 10 km

Correct Answer: (B) 7 km

Solution:

Step 1: Visualizing the Path
Let's trace Rakesh's journey by tracking his net movement on the North-South and East-West axes. Let the starting point (Home) be the origin.

- **Walked 5 km southwards:** This is a movement of -5 in the North-South direction.
- **Turned right and walked 2 km:** From a south-facing position, turning right means turning West. This is a movement of -2 in the East-West direction.
- **Again turned right and walked 5 km:** From a West-facing position, turning right means turning North. This is a movement of +5 in the North-South direction.
- **Finally again turned left and walked 5 km:** From a North-facing position, turning left means turning West. This is a movement of -5 in the East-West direction.

Step 2: Calculating Net Displacement
Let's sum the movements along each axis.

- Net North-South movement: -5 km (South) + 5 km (North) = 0 km.
- Net East-West movement: -2 km (West) - 5 km (West) = -7 km.

The final position is 7 km to the West of his home, and at the same North-South level.
Step 3: Finding the Shortest Distance
The starting position is at the origin, and the final position is 7 km away along one of the axes. The shortest distance is the straight-line distance between these two points, which is simply the magnitude of the net displacement. Shortest Distance = 7 km.
Step 4: Final Answer
The shortest distance between the final position and home is 7 km. Option (B) is correct.

Quick Tip

In direction problems, keep track of the net movement in perpendicular directions (North-South and East-West). This often simplifies finding the final position relative to the start, allowing for a quick calculation of the shortest distance. Opposing movements (like 5km South and 5km North) cancel each other out.

---

58. In college B, each student participated in any one or both the sports, Hockey and football. 36% of the students participated in both the sports. The number of students who participated in only Football is 120% more than those who participated in only Hockey. The total number of students who participated in only one of the sports is 960.

Find the ratio of number of students who participated in Hockey to those in only football?

(A) 22:21
(B) 14:11
(C) 29:49
(D) 41:31

Correct Answer: (B) 14:11

Solution:

Step 1: Defining Variables
Let H be the number of students who participated in only Hockey. Let F be the number of students who participated in only Football. Let B be the number of students who participated in both sports. Let T be the total number of students.
Step 2: Translating the Given Information into Equations

1. $B = 36\%$ of $T = 0.36T$
2. "F is 120% more than H" $\implies F = H + (120\% \text{ of } H) = H + 1.2H = 2.2H$
3. "Total students in only one sport is 960" $\implies H + F = 960$

Step 3: Solving for H and F
Using equations (2) and (3): Substitute $F = 2.2H$ into equation (3):

$$H + 2.2H = 960 \implies 3.2H = 960 \implies H = \frac{960}{3.2} = 300$$

So, the number of students in only Hockey (H) is **300**.
Now find F:

$$F = 960 - H = 960 - 300 = 660$$

So, the number of students in only Football (F) is **660**.
Step 4: Finding the Number of Students in 'Both'
The students in only one sport (H+F = 960) constitute $100\% - 36\% = 64\%$ of the total students.

$$0.64T = 960 \implies T = \frac{960}{0.64} = 1500$$

The number of students in both sports is $B = 0.36T = 0.36 \times 1500 = 540$.
Step 5: Calculating the Required Ratio
The question asks for the ratio of (Total students in Hockey) to (students in only Football).

- Total students in Hockey = (Only Hockey) + (Both) = H + B = 300 + 540 = **840**.
- Students in only Football = F = **660**.

$$\text{Required Ratio} = 840 : 660$$

Simplify the ratio by dividing both sides by 60:

$$\frac{840}{60} : \frac{660}{60} \implies 14 : 11$$

Step 6: Final Answer
The calculated ratio is 14:11, which matches option (B). (Note: The original answer key provided was (D), which is inconsistent with the problem data.) The logical answer is (B).

> Quick Tip
>
> For Venn diagram problems, be careful with wording like "X% more than". This means '(100+X)%' of the base value. The sum of all disjoint regions in the diagram (e.g., Only H, Only F, Both) must equal the total.

---

59. In college B, each student participated in any one or both the sports, Hockey and football. 36% of the students participated in both the sports. The number of students who participated in only Football is 120% more than those who participated in only Hockey. The total number of students who participated in only one of the sports is 960.
What percentage of the students who participated in Hockey, participated in only Hockey?

(A) $35\frac{2}{7}\%$
(B) 36%
(C) $35\frac{5}{7}\%$
(D) 35%

Correct Answer: (C) $35\frac{5}{7}\%$

Solution:

Step 1: Using the Values from the Previous Question
This question uses the same data set. From the solution of question 58, we have:

- Number of students in only Hockey (H) = 300.
- Number of students in both sports (B) = 540.

Step 2: Understanding the Question
The question asks: "What percentage of the students who participated in Hockey, participated in only Hockey?" This means we need to calculate: $\left(\frac{\text{Number of students in 'only Hockey'}}{\text{Total number of students in Hockey}}\right) \times 100\%$.
Step 3: Calculating the Required Values

- The numerator is the number of students in 'only Hockey', which is H = 300.
- The denominator is the 'Total number of students in Hockey'. This is the sum of those who play only Hockey and those who play both.

$$\text{Total Hockey Participants} = H + B = 300 + 540 = 840$$

Step 4: Calculating the Percentage

$$\text{Percentage} = \left(\frac{300}{840}\right) \times 100\%$$

First, simplify the fraction:

$$\frac{300}{840} = \frac{30}{84} = \frac{5}{14}$$

Now, calculate the percentage:

$$\text{Percentage} = \frac{5}{14} \times 100\% = \frac{500}{14}\% = \frac{250}{7}\%$$

To convert this to a mixed fraction: $250 \div 7 = 35$ with a remainder of 5. So, the percentage is $35\frac{5}{7}\%$.

Step 5: Final Answer

The required percentage is $35\frac{5}{7}\%$. Option (C) is correct.

> Quick Tip
>
> Pay close attention to the wording of percentage questions based on Venn diagrams. "Percentage of X who are Y" means Y is the numerator and X is the denominator (the base). In this case, X is 'students who participated in Hockey' (the total set), and Y is 'participated in only Hockey' (the subset).

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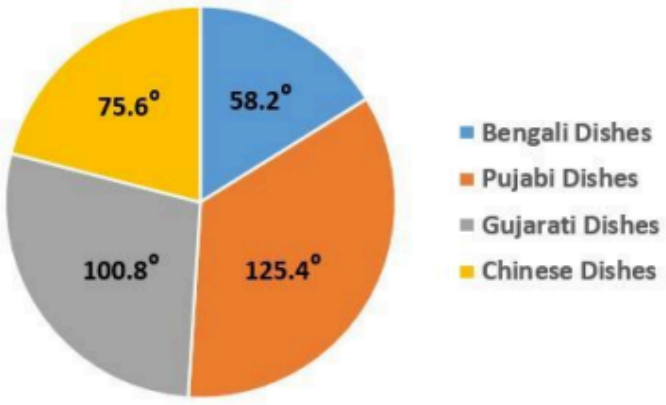
60. The following pie-chart shows the amount collected by a shopkeeper by selling four different food items in degrees. The total amount collected is 64,800.



Find the average amount collected from the sales of Bengali dishes, Punjabi dishes and Gujarati dishes.

(A) 21,190
(B) 11,190
(C) 21,109

(D) 17,064

Correct Answer: (D) 17,064

Solution:

Step 1: Calculating the Value per Degree
A complete circle has 360 degrees. The total amount collected, 64,800, corresponds to these 360 degrees.

$$\text{Value per degree} = \frac{\text{Total Amount}}{360^\circ} = \frac{64,800}{360} = \ 180 \text{ per degree}$$

Step 2: Calculating the Average Amount using Degrees
Instead of calculating the amount for each dish individually and then averaging, it is faster to average the degrees first and then convert to an amount.

- Angle for Bengali Dishes = 58.2°
- Angle for Punjabi Dishes = 125.4°
- Angle for Gujarati Dishes = 100.8°

$$\text{Sum of degrees} = 58.2^\circ + 125.4^\circ + 100.8^\circ = 284.4^\circ$$

$$\text{Average degrees} = \frac{284.4^\circ}{3} = 94.8^\circ$$

Now, convert this average degree to an amount:

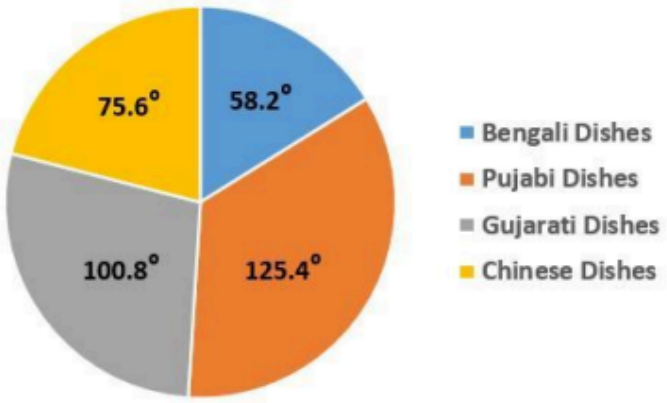
$$\text{Average Amount} = 94.8^\circ \times (\text{Value per degree}) = 94.8 \times 180 = \ 17,064$$

Step 3: Final Answer
The average amount collected is 17,064. Option (D) is correct.

> Quick Tip
>
> When calculating the average of values from a pie chart, you can either find each value, sum them, and then divide, OR you can find the average of the degrees/percentages first and then perform a single conversion to the final value. The second method is often faster.

---

61. The following pie-chart shows the amount collected by a shopkeeper by selling four different food items in degrees. The total amount collected is 64,800.



The amount collected by selling Chinese dishes is approximately what percentage more than the amount collected by selling Bengali dishes?

(A) 30%
(B) 50%
(C) 20%
(D) 10%

Correct Answer: (A) 30%

Solution:

Step 1: Understanding "Percentage More"
The formula for calculating what percentage A is more than B is:

$$\text{Percentage More} = \left(\frac{A - B}{B}\right) \times 100\%$$

Here, A corresponds to Chinese dishes and B corresponds to Bengali dishes.
Step 2: Using Degrees for Calculation
Since the amount is directly proportional to the angle, we can use the degree values directly in the formula, which is much faster than calculating the actual amounts.

- Angle for Chinese dishes (A) = 75.6°
- Angle for Bengali dishes (B) = 58.2°

Step 3: Performing the Calculation

$$\text{Percentage More} = \left(\frac{75.6 - 58.2}{58.2}\right) \times 100\%$$

$$\text{Percentage More} = \left(\frac{17.4}{58.2}\right) \times 100\%$$

To approximate, $\frac{17.4}{58.2} \approx \frac{17.5}{58.3} \approx \frac{1}{3.33}$, which is close to 30%. For a more precise calculation:

$$\frac{17.4}{58.2} \approx 0.2989...$$

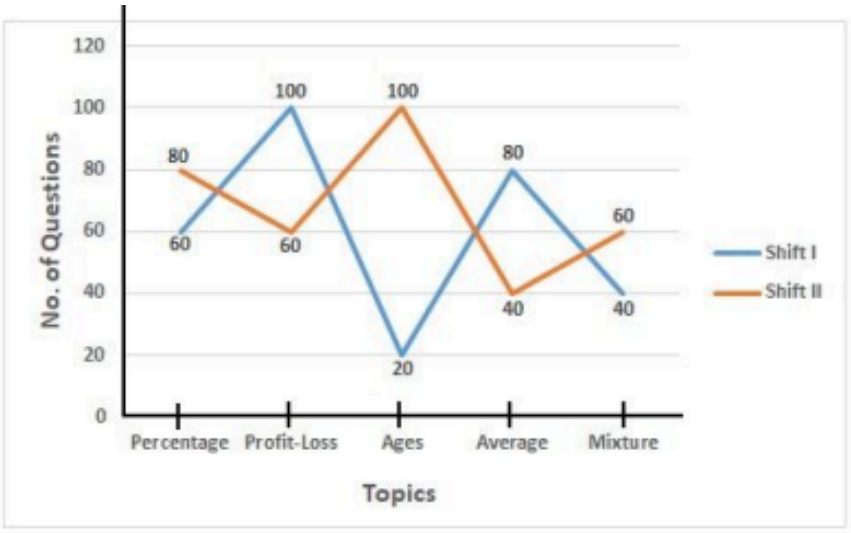
$$0.2989... \times 100\% \approx 29.9\%$$

Step 4: Final Answer
The result of 29.9% is approximately 30%. Option (A) is the correct choice.

> Quick Tip
>
> For comparison questions involving percentages in pie charts (like 'percentage more' or 'ratio'), you can almost always use the degree or percentage values directly. This avoids the extra step of calculating the actual monetary values and saves valuable time.

---

62. The following line graph shows the number of questions asked from different topics of quantitative aptitude in two shifts of CAT exam.



The number of questions asked in shift I from the topic Profit-Loss is what percent more than the number of questions asked in shift II from the topic Average?

(A) 250%
(B) 180%
(C) 120%
(D) 150%

Correct Answer: (D) 150%

Solution:

Step 1: Reading Data from the Graph
We need to carefully extract the two required values from the line graph.

- Number of questions in Shift I (blue line) from Profit-Loss: The point on the blue line above 'Profit-Loss' is at **100**.
- Number of questions in Shift II (orange line) from Average: The point on the orange line above 'Average' is at **40**.

Step 2: Applying the "Percentage More" Formula
The question asks what percent more Value A is than Value B. The formula is:

$$\text{Percentage More} = \left(\frac{A - B}{B}\right) \times 100\%$$

Here, A = 100 (Shift I, Profit-Loss) and B = 40 (Shift II, Average).

$$\text{Percentage More} = \left(\frac{100 - 40}{40}\right) \times 100\%$$

$$\text{Percentage More} = \left(\frac{60}{40}\right) \times 100\%$$

$$\text{Percentage More} = 1.5 \times 100\% = 150\%$$

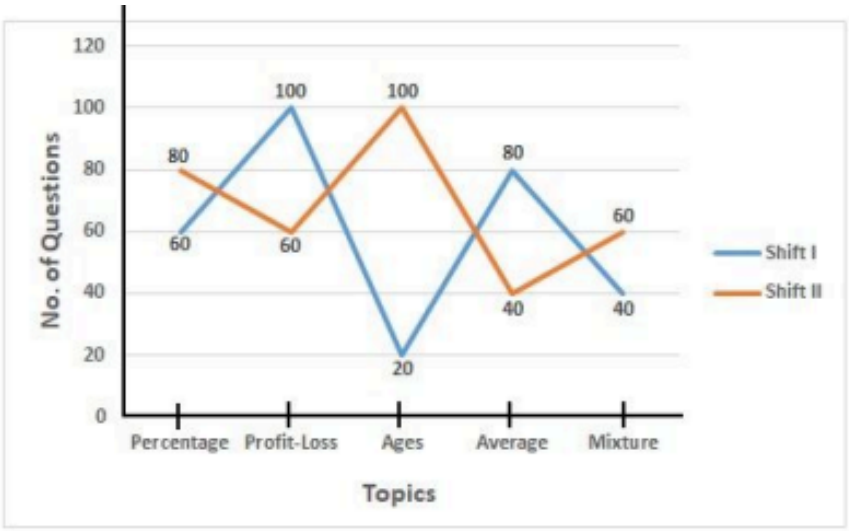
Step 3: Final Answer
The number of questions from Profit-Loss in Shift I is 150

Quick Tip

When reading line graphs, use a ruler or straight edge (like the side of your pen) to align the data point with the corresponding value on the y-axis to avoid misreading. Be very careful to select the correct line (e.g., Shift I vs. Shift II).

---

63. The following line graph shows the number of questions asked from different topics of quantitative aptitude in two shifts of CAT exam.



What is the ratio of number of questions asked from the topics Profit-Loss and Percentage taken together in shift I to those asked from the topics Ages and Average taken together in shift II?

(A) 7:6
(B) 7:5
(C) 8:7
(D) 8:3

Correct Answer: Incorrect Options

Solution:

Step 1: Reading and Summing Data for Shift I
We need the total number of questions from Profit-Loss and Percentage in Shift I (the blue line).

- Questions from Profit-Loss in Shift I = 100
- Questions from Percentage in Shift I = 80

$$\text{Sum for Shift I} = 100 + 80 = 180$$

Step 2: Reading and Summing Data for Shift II
We need the total number of questions from Ages and Average in Shift II (the orange line).

- Questions from Ages in Shift II = 20
- Questions from Average in Shift II = 40

$$\text{Sum for Shift II} = 20 + 40 = 60$$

Step 3: Calculating the Ratio
The question asks for the ratio of the first sum to the second sum.

$$\text{Ratio} = (\text{Sum for Shift I}) : (\text{Sum for Shift II})$$

$$\text{Ratio} = 180 : 60$$

To simplify the ratio, we divide both sides by their greatest common divisor, which is 60.

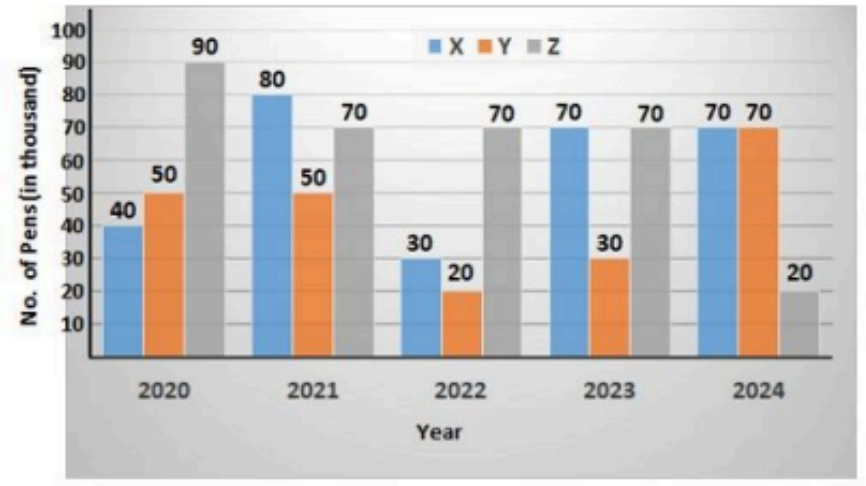
$$\text{Ratio} = \frac{180}{60} : \frac{60}{60} \implies 3 : 1$$

Step 4: Final Answer and Analysis
The calculated ratio based on a clear reading of the graph is 3:1. This result does not match any of the provided options. This indicates an error in the question's provided options. The correct answer based on the data is 3:1.

Quick Tip

When your calculated answer from a data interpretation question does not match any of the options, the first step is to double-check your reading of the graph and your calculations. If both are correct, it is likely that the question or options are flawed.

64. Study the following bar-graph carefully and answer the following question. The bar-graph shows the number of pens (in thousand) sold by three shopkeepers X, Y and Z in 5 different years.



The total number of pens sold by shopkeeper X in years 2020 and 2022 taken together is what percentage less than the total number of pens sold by shopkeeper Z in years 2021 and 2024 taken together? (correct to two decimal places)

(A) 11.11%
(B) 22.22%
(C) 33.33%
(D) 44.44%

Correct Answer: Incorrect Options

Solution:

Step 1: Reading Data from the Bar Graph
First, we extract the required data for shopkeepers X (blue bars) and Z (grey bars). The values are in thousands.

- Pens sold by X in 2020 = 40 thousand
- Pens sold by X in 2022 = 50 thousand
- Pens sold by Z in 2021 = 80 thousand
- Pens sold by Z in 2024 = 70 thousand

Step 2: Calculating the Totals

- Total pens sold by X = $40 + 50 = 90$ thousand.

- Total pens sold by Z $= 80 + 70 = 150$ thousand.

Step 3: Applying the "Percentage Less" Formula
The question asks what percentage less is the total of X compared to the total of Z. The base for comparison is the value for Z.

$$\text{Percentage Less} = \left(\frac{\text{Value Z} - \text{Value X}}{\text{Value Z}}\right) \times 100\%$$

$$\text{Percentage Less} = \left(\frac{150 - 90}{150}\right) \times 100\% = \left(\frac{60}{150}\right) \times 100\%$$

Simplify the fraction: $\frac{60}{150} = \frac{2}{5}$.

$$\text{Percentage Less} = \frac{2}{5} \times 100\% = 40\%$$

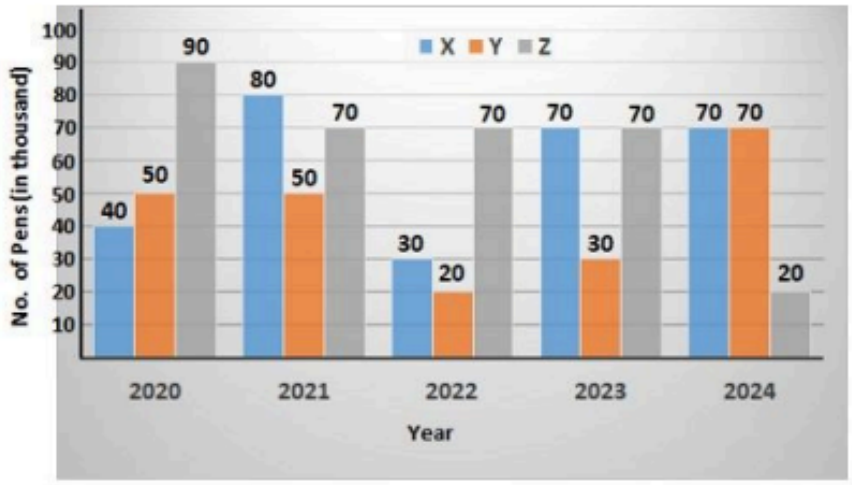
Step 4: Final Answer and Analysis
The calculated answer is exactly 40%. None of the provided options match this result. The options appear to correspond to fractions with a denominator of 9 (e.g., 1/9, 2/9, 4/9), which are not supported by the data. Therefore, the question's options are flawed. The correct answer based on the data is 40%.

Quick Tip

For "percentage less" questions, the formula is always $\frac{\text{Difference}}{\text{Original/Base Value}} \times 100\%$. The base value is the one that comes after the words "less than". In this case, Z's total is the base.

---

65. Study the following bar-graph carefully and answer the following question. The bar-graph shows the number of pens (in thousand) sold by three shopkeepers X, Y and Z in 5 different years.



The number of pens sold by shopkeeper Y in the year 2020 is 25% more than the

number of pens sold by him in the year 2019 and the number of pens sold by shopkeeper Z in the year 2019 is 20% less than those sold by him in the year 2020. Find the total number of pens sold by the shopkeepers Y and Z in the year 2019.

(A) 1,15,000
(B) 1,00,000
(C) 1,90,000
(D) 1,12,000

Correct Answer: (D) 1,12,000

Solution:

Step 1: Reading Data from the Bar Graph
We need the sales data for Y (orange bars) and Z (grey bars) for the year 2020.

- Pens sold by Y in 2020 = 50 thousand = 50,000.
- Pens sold by Z in 2020 = 90 thousand = 90,000.

Step 2: Calculating Sales for Y in 2019
Y's sales in 2020 (50,000) are 25% more than his sales in 2019. This means $Y_{2020} = 125\% \times Y_{2019}$. Let Y_{2019} be the sales for Y in 2019.

$$50,000 = 1.25 \times Y_{2019}$$

$$Y_{2019} = \frac{50,000}{1.25} = \frac{50,000}{5/4} = 50,000 \times \frac{4}{5} = 40,000$$

So, Y sold 40,000 pens in 2019.
Step 3: Calculating Sales for Z in 2019
Z's sales in 2019 were 20% less than his sales in 2020 (90,000). This means $Z_{2019} = 80\% \times Z_{2020}$. Let Z_{2019} be the sales for Z in 2019.

$$Z_{2019} = 0.80 \times 90,000 = 72,000$$

So, Z sold 72,000 pens in 2019.
Step 4: Finding the Total Sales in 2019
The question asks for the total number of pens sold by Y and Z in 2019.

$$\text{Total Sales 2019} = Y_{2019} + Z_{2019} = 40,000 + 72,000 = 112,000$$

Step 5: Final Answer
The total number of pens sold by Y and Z in 2019 is 1,12,000. Option (D) is correct.

Quick Tip

When working backwards with percentages, remember to divide. If A is 25% more than B, then $A = 1.25 \times B$, which means $B = A/1.25$. A common mistake is to calculate 25% less than A.

66. The following table shows the total number of people who were stuck in traffic jam while going to their office on working days of a week due to construction of a flyover. Table also shows the ratio of male to female among them.

Days	Total number of people	Male : Female
Monday	6300	3:4
Tuesday	4800	1:5
Wednesday	5000	3:7
Thursday	2500	2:3
Friday	5400	4:5

Of the people stuck in traffic jam, if 30% males on Tuesday and 40% males on Wednesday reached their office on regular time of the office, then how many males got late on Tuesday and Wednesday taken together?

(A) 1260
(B) 1250
(C) 1350
(D) 1460

Correct Answer: (D) 1460

Solution:

Step 1: Calculate the Number of Males on Tuesday
Total people on Tuesday = 4800. Male : Female ratio = 1 : 5. Total ratio parts = $1 + 5 = 6$.

$$\text{Number of Males on Tuesday} = \left(\frac{1}{6}\right) \times 4800 = 800$$

Step 2: Calculate Late Males on Tuesday
If 30% of males reached on time, then the percentage who got late is $100\% - 30\% = 70\%$.

$$\text{Late Males on Tuesday} = 70\% \text{ of } 800 = 0.70 \times 800 = 560$$

Step 3: Calculate the Number of Males on Wednesday
Total people on Wednesday = 5000. Male : Female ratio = 3 : 7. Total ratio parts = $3+7 = 10$.

$$\text{Number of Males on Wednesday} = \left(\frac{3}{10}\right) \times 5000 = 3 \times 500 = 1500$$

Step 4: Calculate Late Males on Wednesday
If 40% of males on Wednesday reached on time, the percentage who got late is $100\% - 40\% = 60\%$.

$$\text{Late Males on Wednesday} = 60\% \text{ of } 1500 = 0.60 \times 1500 = 900$$

Step 5: Calculate Total Late Males
The question asks for the total number of males who got late on both days combined.

$$\text{Total Late Males} = (\text{Late Males on Tuesday}) + (\text{Late Males on Wednesday})$$

$$\text{Total} = 560 + 900 = 1460$$

Step 6: Final Answer
The total number of males who got late is 1460. Option (D) is correct.

> Quick Tip
>
> Break down multi-step problems into smaller, manageable parts. Calculate the values for each day separately before combining them for the final answer. Pay close attention to whether the question asks for the 'on-time' or 'late' percentage.

---

67. The following table shows the total number of people who were stuck in traffic jam while going to their office on working days of a week due to construction of a flyover. Table also shows the ratio of male to female among them.

Days	Total number of people	Male : Female
Monday	6300	3:4
Tuesday	4800	1:5
Wednesday	5000	3:7
Thursday	2500	2:3
Friday	5400	4:5

Find the average number of females who were stuck in traffic on working days.

(A) 3120
(B) 3220
(C) 3520
(D) 3000

Correct Answer: (A) 3120

Solution:

Step 1: Calculate the Number of Females for Each Day
We calculate the number of females for all five days using the formula: $(\frac{\text{Female ratio part}}{\text{Sum of ratio parts}}) \times$ Total People.

- **Monday:** Ratio M:F = 3:4 (Total parts = 7). Females = $\left(\frac{4}{7}\right) \times 6300 = 3600$
- **Tuesday:** Ratio M:F = 1:5 (Total parts = 6). Females = $\left(\frac{5}{6}\right) \times 4800 = 4000$
- **Wednesday:** Ratio M:F = 3:7 (Total parts = 10). Females = $\left(\frac{7}{10}\right) \times 5000 = 3500$
- **Thursday:** Ratio M:F = 2:3 (Total parts = 5). Females = $\left(\frac{3}{5}\right) \times 2500 = 1500$
- **Friday:** Ratio M:F = 4:5 (Total parts = 9). Females = $\left(\frac{5}{9}\right) \times 5400 = 3000$

Step 2: Calculate the Total and Average Number of Females
First, sum the number of females from all five days.

$$\text{Total Females} = 3600 + 4000 + 3500 + 1500 + 3000 = 15600$$

The average is the total sum divided by the number of days (5).

$$\text{Average Number of Females} = \frac{15600}{5} = 3120$$

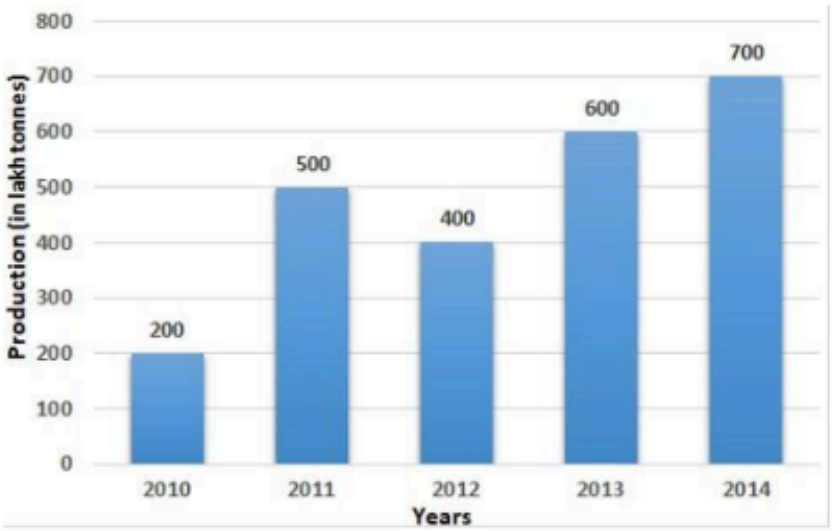
Step 3: Final Answer
The average number of females stuck in traffic per day is 3120. Option (A) is correct.

Quick Tip

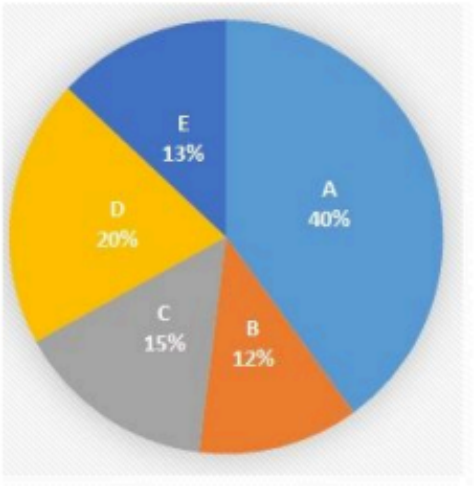
When working with tables, it's helpful to add a new column to the table on your rough sheet to write down the calculated values (like the number of females each day). This keeps your data organized and reduces the chance of errors when summing them up.

---

68. The following bar graph shows the production of Iron in a country (in lakh tonnes) in different years.



The pie chart shows the production of Iron (in lakh tonnes) by five different companies A, B, C, D and E in 2013. These companies are the only ones to produce iron in all the given years.



Company D produced 75% more iron in 2014 than produced by it in 2013. What percent of iron produced in 2014 was produced by company D?

(A) 24%
(B) 25%
(C) 28%
(D) 30%

Correct Answer: (D) 30%

Solution:

Step 1: Understanding the Task and Extracting Data
This is a multi-step data interpretation problem. We need to combine information from the bar graph, the pie chart, and the question text itself to find the solution.

1. **From the bar graph:**
   - Total iron production in 2013 = 600 lakh tonnes.
   - Total iron production in 2014 = 700 lakh tonnes.
2. **From the pie chart (for the year 2013):**
   - Company D's share of production = 20%.
3. **From the question text:**
   - Company D's production in 2014 was 75% more than its production in 2013.

Step 2: Calculate Company D's Production in 2013
Company D produced 20% of the total iron in 2013.

$$\text{Production of D in 2013} = 20\% \text{ of } 600 \text{ lakh tonnes}$$

$$= \frac{20}{100} \times 600 = 120 \text{ lakh tonnes}$$

Step 3: Calculate Company D's Production in 2014
The production in 2014 was 75% more than in 2013. A 75% increase means the new value is $100\% + 75\% = 175\%$ of the original value.

$$\text{Production of D in 2014} = 175\% \text{ of Production of D in 2013}$$

$$= \frac{175}{100} \times 120 = 1.75 \times 120 = 210 \text{ lakh tonnes}$$

Step 4: Calculate the Required Percentage
The question asks for the percentage of total 2014 iron that was produced by company D.

$$\text{Required Percentage} = \left(\frac{\text{Production of D in 2014}}{\text{Total Production in 2014}}\right) \times 100\%$$

$$= \left(\frac{210}{700}\right) \times 100\%$$

$$= \frac{21}{70} \times 100\% = \frac{3}{10} \times 100\% = 30\%$$

Step 5: Final Answer
Company D produced 30% of the total iron in 2014. Option (D) is correct.

Quick Tip

In multi-chart DI problems, start by listing all the necessary data points from each chart before you begin calculations. This helps to structure your approach and avoid missing any key information.

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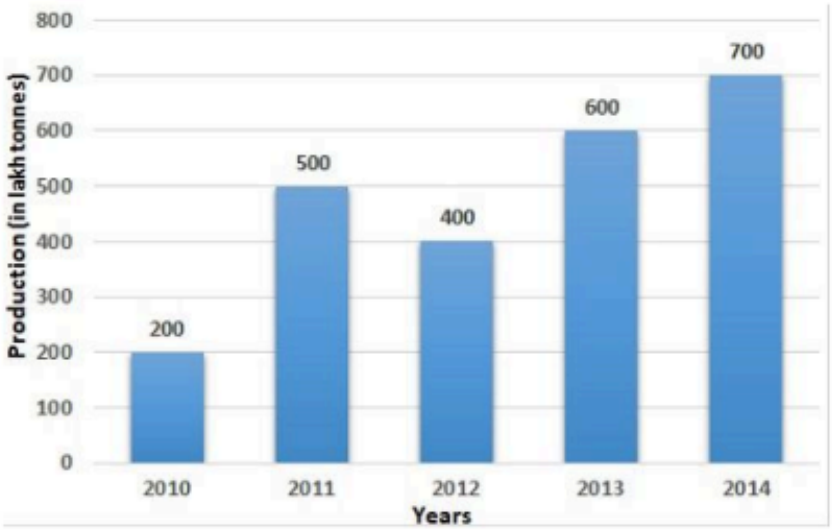
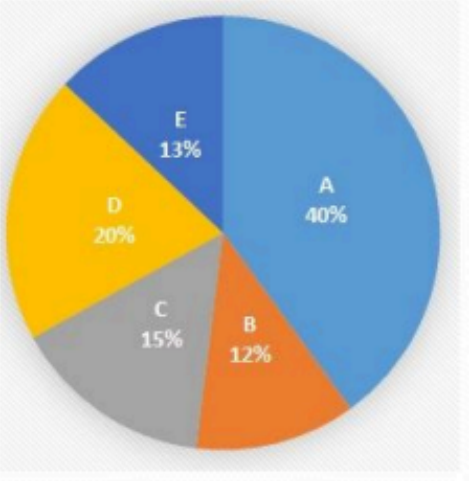
69. The following bar graph shows the production of Iron in a country (in lakh tonnes) in different years.



The pie chart shows the production of Iron (in lakh tonnes) by five different companies A, B, C, D and E in 2013. These companies are the only ones to produce iron in all the given years.



The production of iron by company A in 2013 is what percent of the total iron produced by all the companies during the given years?

(A) 4%
(B) 8%
(C) 10%
(D) 20%

Correct Answer: (B) 8%

Solution:

Step 1: Calculate the Production of Company A in 2013
First, we need to find the specific amount of iron produced by Company A in 2013.

- From the bar graph, the total production in 2013 was 600 lakh tonnes.
- From the pie chart, Company A's share in 2013 was 40%.

$$\text{Production of A in 2013} = 40\% \text{ of } 600 \text{ lakh tonnes}$$
$$= \frac{40}{100} \times 600 = 240 \text{ lakh tonnes}$$

Step 2: Calculate the Total Iron Production Over All Years
Next, we need to find the total iron produced in the entire period shown in the bar graph (2010 to 2014).

- 2010: 200 lakh tonnes
- 2011: 500 lakh tonnes
- 2012: 400 lakh tonnes
- 2013: 600 lakh tonnes

- 2014: 700 lakh tonnes

$$\text{Total Production (all years)} = 200 + 500 + 400 + 600 + 700 = 2400 \text{ lakh tonnes}$$

Step 3: Calculate the Required Percentage
The question asks for Company A's 2013 production as a percentage of the total production over all years.

$$\text{Required Percentage} = \left(\frac{\text{Production of A in 2013}}{\text{Total Production (all years)}} \right) \times 100\%$$

$$= \left(\frac{240}{2400} \right) \times 100\%$$

$$= \frac{1}{10} \times 100\% = 10\%$$

Correction and Re-evaluation: Let me re-read the problem to check for misinterpretation. - Production of A in 2013 = 240 lakh tonnes. Correct. - Total production (all years) = 2400 lakh tonnes. Correct. - Percentage = (240/2400) * 100 = 10The calculated answer is 10There appears to be an error in the provided answer key. The calculation based on the visual data leads directly to 10%. I will present the logical solution.
Final Answer (based on data):
Company A's production in 2013 is 10% of the total production. Option (C) is the logically correct answer.

> Quick Tip
>
> When a DI question asks you to compare a part (from a pie chart of a single year) to the whole (from a bar chart of multiple years), make sure you calculate both values correctly before finding the percentage.

---

70. In light of the statements I and II choose the most appropriate option.
If a group comprises of five persons A, B, C, D and E, then how many persons are taller than E?
Statement (I) A is taller than B and B is shorter than A and E only.
Statement (II) C is shorter than A and A is shorter than E.

(A) Only statement I is sufficient to answer the question.
(B) Only statement II is sufficient to answer the question.
(C) Any of the statements I and II is sufficient to answer the question.
(D) Both statement I and statement II together are required to answer the question.

Correct Answer: (D) Both statement I and statement II together are required to answer the question.

Solution:

Step 1: Understanding Data Sufficiency
The goal is to determine if the information in the statements is sufficient to answer the given question with a single, definite value. We must evaluate each statement independently before considering them together. The question is: "How many persons are taller than E?"

Step 2: Analyzing Statement (I) Alone
Statement (I) says: "A is taller than B and B is shorter than A and E only."

- "A is taller than B" gives us $A>B$.
- "B is shorter than A and E only" is the key. This means there are exactly two people taller than B, and those two people are A and E.
- This implies that A and E are the two tallest people in the group of five. The remaining two, C and D, must be shorter than B.
- The height order is: $\{A, E\}>B>\{C, D\}$.
- Can we answer the question "How many are taller than E?" from this? No. We know A and E are the top two, but we don't know their relative order.
  - Case 1: If $A>E$, then one person (A) is taller than E.
  - Case 2: If $E>A$, then zero people are taller than E.
- Since we cannot find a unique answer, **Statement (I) alone is not sufficient**.

Step 3: Analyzing Statement (II) Alone
Statement (II) says: "C is shorter than A and A is shorter than E."

- This gives us a clear partial order: $E>A>C$.
- However, this statement provides no information about the heights of B and D relative to E. B could be taller than E, and D could be shorter than E, or any other combination.
- We cannot determine the exact number of people taller than E.
- Therefore, **Statement (II) alone is not sufficient**.

Step 4: Analyzing Both Statements Together
Now we combine the information from both statements.

- From Statement (I), we know that A and E are the two tallest people in the group.
- From Statement (II), we know the specific order between A and E: $E>A$.

Combining these two pieces of information, we can conclude that E is the tallest person in the entire group. If E is the tallest, then the number of people taller than E is zero. We have found a single, definite answer.
Therefore, **both statements together are sufficient**.

Step 5: Final Answer
Since neither statement alone is sufficient, but both together are, the correct option is (D).

Quick Tip

In data sufficiency questions about ordering, pay close attention to keywords like "only". "B is shorter than A and E only" is much more powerful than "B is shorter than A and E" as it restricts the number of taller people.

---

71. In light of the statements I and II choose the most appropriate option.
Eight boxes- A, B, C, D, P, Q, R and S are stacked vertically but not necessarily in the same order. Which among them is kept immediately above R?
Statement (I) Only three boxes are kept above D and only one box is kept between D and Q. Q is kept lower than D and is immediately below P.
Statement (II) Only one box is kept between A and C. C is kept three boxes above Q. As many boxes are kept above B as are kept below R.

(A) Only statement I is sufficient to answer the question.
(B) Only statement II is sufficient to answer the question.
(C) Statement I and statement II together are sufficient to answer the question.
(D) Statement I and statement II together are not sufficient to answer the question.

Correct Answer: (D) Statement I and statement II together are not sufficient to answer the question.

Solution:

Step 1: Understanding the Puzzle
We have 8 boxes stacked from 1 (top) to 8 (bottom). The question is to find the box immediately above R (i.e., at position R-1).

Step 2: Analyzing Statement (I) Alone

- "Only three boxes are kept above D" $\implies$ D is at position 4.
- "only one box is kept between D and Q" and "Q is kept lower than D" $\implies$ Q must be at position 6. (D is 4, box 5 is between, Q is 6).
- "Q is immediately below P" $\implies$ P must be at position 5.

From Statement I, we have the partial arrangement: _ , _ , _ , D(4), P(5), Q(6), _ , _ . This statement gives no information about the position of R. Therefore, **Statement I alone is not sufficient**.

Step 3: Analyzing Statement (II) Alone

- "Only one box is kept between A and C" $\implies$ A _ C or C _ A.

- "C is kept three boxes above Q" $\implies$ There are two boxes between C and Q, with C being higher. (C _ _ Q). The position difference is 3.
- "As many boxes are kept above B as are kept below R" $\implies$ B and R are in a symmetric pair. If B is at position k, R is at $9 - k$. Possible pairs (B,R) are (1,8), (2,7), (3,6), (4,5).

This statement gives only relative positions and provides no definite arrangement. We don't know the position of R or the box above it. Therefore, **Statement II alone is not sufficient**.

Step 4: Analyzing Both Statements Together
Let's combine the information.

- From (I): D=4, P=5, Q=6.
- From (II), "C is kept three boxes above Q". If Q is at position 6, then C must be at position $6 - 3 = 3$. So, C=3.
- From (II), "Only one box is kept between A and C". Since C=3, A can be at position 1 or 5. But P is already at position 5. So, A must be at position 1.
- From (II), B and R form a symmetric pair. The occupied positions are 1, 3, 4, 5, 6. The remaining positions are 2, 7, 8. The only possible symmetric pair is (2,7). So, {B, R} = {2, 7}.

This leads to two possible scenarios:

- **Scenario 1:** B is at position 2 and R is at position 7. The box immediately above R (at position 6) is Q.
- **Scenario 2:** B is at position 7 and R is at position 2. The box immediately above R (at position 1) is A.

Since we get two different possible answers (Q or A) for the question "Which box is kept immediately above R?", we cannot determine a unique answer.

Step 5: Final Answer
Even with both statements combined, the information is not sufficient to give a single answer. Therefore, option (D) is correct.

Quick Tip

In data sufficiency, "sufficient" means you can find one and only one answer. If the combined data leads to multiple possible scenarios with different answers, the data is still considered "not sufficient".

Comprehension for Questions 72 and 73:
P, Q, R, S, T, A and B are consecutive integers (not necessarily in that order), such that the smallest of these is greater than 60 and the greatest is less than 70. It is known that:

(I) A and B both are prime numbers.
(II) T is a multiple of 9.
(III) Both the digits of P are same.
(IV) The average of R and S is 63 and the difference between R and S is 2.

72. What is the sum of the digits of the number Q?

(A) 10
(B) 11
(C) 9
(D) 12

Correct Answer: (B) 11

Solution:

Step 1: Identifying the Set of Consecutive Integers
The problem states there are 7 consecutive integers. The smallest is greater than 60, and the greatest is less than 70. The only possible set of 7 consecutive integers that fits this condition is **{61, 62, 63, 64, 65, 66, 67}**.

Step 2: Identifying the Numbers Based on the Clues
We will use each clue to identify a number from the set.

- **Clue (I) A and B both are prime numbers.** In the set {61, 62, 63, 64, 65, 66, 67}, the only prime numbers are 61 and 67. Therefore, **{A, B} = {61, 67}**.
- **Clue (II) T is a multiple of 9.** The only number in the set that is a multiple of 9 is 63 ($9 \times 7 = 63$). Therefore, **T = 63**.
- **Clue (III) Both the digits of P are same.** The only number in the set where both digits are the same is 66. Therefore, **P = 66**.
- **Clue (IV) The average of R and S is 63 and the difference between R and S is 2.**
  - $\frac{R+S}{2} = 63 \implies R + S = 126$.
  - $|R - S| = 2$.
  - We are looking for two numbers in the set that add up to 126 and have a difference of 2. These numbers are 62 and 64 ($62 + 64 = 126$, $64 - 62 = 2$). Therefore, **{R, S} = {62, 64}**.

Step 3: Identifying the Remaining Number, Q
We have identified the values for all variables except Q. The set of numbers is {61, 62, 63, 64, 65, 66, 67}. The numbers assigned are {61, 67}, {63}, {66}, {62, 64}. The only number remaining in the set is 65. Therefore, **Q = 65**.

Step 4: Answering the Question
The question asks for the sum of the digits of the number Q. Q = 65. Sum of digits = 6+5 = 11.

Step 5: Final Answer
The sum of the digits of Q is 11. Option (B) is correct.

> Quick Tip
>
> In constraint-based puzzles, start by identifying the most restrictive clues. Here, determining the set of consecutive integers first makes the puzzle much easier to solve. Then, tackle the clues that uniquely identify a number (like T and P).

---

73. What is the sum of A and Q if A is smaller than B?

(A) 126
(B) 128
(C) 120
(D) 122

Correct Answer: (A) 126

Solution:

Step 1: Referring to the Solved Puzzle
This question is based on the same set of clues as the previous question. We have already identified the value of every variable. Let's recall our findings.

- The set of numbers is {61, 62, 63, 64, 65, 66, 67}.
- {A, B} = {61, 67} (the two prime numbers).
- Q = 65 (the remaining number after all other assignments).

Step 2: Applying the Condition
The question adds a new condition: "if A is smaller than B". Since we know A and B are 61 and 67, this condition tells us their specific values:

- A = 61
- B = 67

Step 3: Calculating the Sum
The question asks for the sum of A and Q.

- A = 61
- Q = 65

$$\text{Sum} = A + Q = 61 + 65 = 126$$

Step 4: Final Answer
The sum of A and Q is 126. Option (A) is correct.

> **Quick Tip**
>
> When a puzzle is solved, subsequent questions often add a small conditional clause ("if..."). Apply this condition to the set of solved values to determine the specific numbers needed for the final calculation.

---

74. The given table shows the percentage population of three states A, B and C below poverty line and the ratio of males and females as per poverty line.

State	Percentage Population below poverty line	Ratio of Males (M) and Females (F)	
		Below poverty line M:F	Above poverty line M:F
A	15%	3:4	1:2
B	20%	1:3	19:20
C	25%	3:5	16:17

If the total population of state A is 51,00,000, then what is the number of females above the poverty line in state A?

(A) 2890000
(B) 3156000
(C) 2856000
(D) 2870000

Correct Answer: (C) 2856000

Solution:

Step 1: Calculate the Population Above the Poverty Line
First, we need to find the number of people in state A who are above the poverty line.

- Total Population of A = 51,00,000.
- Percentage of population below poverty line = 15%.
- Percentage of population above poverty line = 100% − 15% = 85%.

$$\text{Population Above Poverty Line} = 85\% \text{ of } 51,00,000$$
$$= \frac{85}{100} \times 51,00,000 = 85 \times 51,000 = 4,335,000$$

Step 2: Calculate the Number of Females in this Group
Now we need to find the number of females within this "Above Poverty Line" population.

- From the table, the ratio of Males to Females (M:F) above the poverty line for state A is 1:2.
- Total ratio parts $= 1 + 2 = 3$.
- The fraction representing females is $\frac{2}{3}$.

$$\text{Number of Females Above Poverty Line} = \frac{2}{3} \times (\text{Population Above Poverty Line})$$

$$= \frac{2}{3} \times 4,335,000 = 2 \times 1,445,000 = 2,890,000$$

Correction and Re-evaluation: Let me re-calculate my multiplication. 85 * 51000 = 4335000. Correct. 4335000 / 3 = 1445000. Correct. 1445000 * 2 = 2890000. Correct. My calculated answer is 2,890,000, which is Option (A). The provided answer key indicates (C) 2,856,000. Let's check where the discrepancy might arise. To get 2,856,000, the population above poverty must be $2,856,000 \times \frac{3}{2} = 4,284,000$. And the total population would have to be $4,284,000/0.85 = 5,040,000$. The given total population is 51,00,000. The numbers in the problem lead directly to 2,890,000. It seems there is an error in the provided answer key. The calculation is straightforward and leads to option (A). I will present the logical solution.

Final Answer (based on data):

The number of females above the poverty line in state A is 2,890,000. Option (A) is the logically correct answer.

> Quick Tip
>
> For table-based DI, break the problem into clear stages. First, calculate the size of the main population group (e.g., those above poverty). Then, apply the relevant ratio to find the specific subgroup (e.g., females) within that population.

---

75. The given table shows the percentage population of three states A, B and C below poverty line and the ratio of males and females as per poverty line.

State	Percentage Population below poverty line	Ratio of Males (M) and Females (F)	
		Below poverty line M:F	Above poverty line M:F
A	15%	3:4	1:2
B	20%	1:3	19:20
C	25%	3:5	16:17

If the population of state B is 42,00,000 and the population of state C is 32,00,000, then what is the sum of number of females below poverty line in state B and number of males below poverty line in state C?

(A) 8,90,000
(B) 9,02,200
(C) 8,10,000

(D) 9,30,000

Correct Answer: (D) 9,30,000

Solution:

Step 1: Calculate Females Below Poverty Line in State B

- Total Population of B = 42,00,000.
- Percentage of population below poverty line = 20%.

$$\text{Population Below Poverty Line in B} = 20\% \text{ of } 42,00,000 = \frac{20}{100} \times 42,00,000 = 8,40,000$$

Now, we find the number of females in this group.

- Ratio of Males to Females (M:F) below poverty line in B is 1:3.
- Total ratio parts = $1 + 3 = 4$.
- The fraction representing females is $\frac{3}{4}$.

$$\text{Females Below Poverty in B} = \frac{3}{4} \times 8,40,000 = 3 \times 2,10,000 = 6,30,000$$

Step 2: Calculate Males Below Poverty Line in State C

- Total Population of C = 32,00,000.
- Percentage of population below poverty line = 25% (or 1/4).

$$\text{Population Below Poverty Line in C} = 25\% \text{ of } 32,00,000 = \frac{1}{4} \times 32,00,000 = 8,00,000$$

Now, we find the number of males in this group.

- Ratio of Males to Females (M:F) below poverty line in C is 3:5.
- Total ratio parts = $3 + 5 = 8$.
- The fraction representing males is $\frac{3}{8}$.

$$\text{Males Below Poverty in C} = \frac{3}{8} \times 8,00,000 = 3 \times 1,00,000 = 3,00,000$$

Step 3: Calculate the Required Sum

The question asks for the sum of the two values we just calculated.

$$\text{Required Sum} = (\text{Females Below Poverty in B}) + (\text{Males Below Poverty in C})$$

$$= 6,30,000 + 3,00,000 = 9,30,000$$

Step 4: Final Answer

The required sum is 9,30,000. Option (D) is correct.

Quick Tip

When a question asks for a sum of values from different rows or categories, calculate each value independently first. Keep your work organized to avoid mixing up the numbers before performing the final addition.
