General Instructions

(i) This booklet contains 104 questions, each provided with a complete, step-by-step solution.

(ii) It comprises 104 single-correct multiple-choice questions.

(iii) Attempt each question on your own before reviewing the given solution.

1. Read the following passage and answer the question that follows.

In Hume's eyes productive labour was the greatest asset of a country, and foreign trade was valuable because it enabled a nation to use more and more varied labour than would otherwise be possible. But commerce was of mutual advantage to the nations involved, not a benefit to one and injury to the other. 'The increase of riches and commerce in any one nation,' added Hume, 'instead of hurting, commonly, promotes the riches and commerce of all its neighbours.' 'The emulation in rival nations serves ... to keep industry alive in all of them.'

The importance of foreign trade, in the eyes of Hume, was due to the fact that:

(A) it allowed the employment of surplus labour in a nation.

(B) it allowed the diversion of labour to export oriented industries.

(C) it allowed the deeper specialisation of the same labour force.

(D) it allowed application of varied labour force in a nation.

Correct Answer: (D) it allowed application of varied labour force in a nation.

SOLUTION:

Step 1: Understanding the Question:
We are asked what Hume saw as the reason foreign trade mattered to a nation. The answer has to come directly from the passage, not from outside knowledge of trade theory, since RC questions test what the author actually wrote, not what we may already believe about trade.

Step 2: Key Approach:
Locate the exact sentence in the passage that gives Hume's reason, then match its wording to the options instead of relying on general economic ideas about trade. Once the key phrase is found, every option can be checked against it one by one.

Step 3: Detailed Explanation:
The passage says foreign trade was valuable because it enabled a nation to use more and more varied labour than would otherwise be possible. The key phrase is varied labour, and that phrase is the yardstick for every option. Checking each option against this phrase, surplus labour (option 1) is about unused labour sitting idle, not about variety, so it is wrong. Diversion to export industries (option 2) is not mentioned anywhere in the passage; it is an assumption brought in from outside. Deeper specialisation of the same labour force (option 3) means labour becomes narrower and more focused on one task, which is close to the reverse of varied. Only application of varied labour force in a nation (option 4) copies Hume's own reasoning almost word for word.

Step 4: Final Answer:

The importance of foreign trade lay in letting a nation apply a varied labour force, so option 4 is correct, and every other option either misreads the passage or introduces an idea the passage never states.

Quick Tip: Match the option to Hume's exact phrase about foreign trade letting a nation use more varied labour.

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2. Read the following passage and answer the question that follows.

In Hume's eyes productive labour was the greatest asset of a country, and foreign trade was valuable because it enabled a nation to use more and more varied labour than would otherwise be possible. But commerce was of mutual advantage to the nations involved, not a benefit to one and injury to the other. 'The increase of riches and commerce in any one nation,' added Hume, 'instead of hurting, commonly, promotes the riches and commerce of all its neighbours.' 'The emulation in rival nations serves ... to keep industry alive in all of them.'

As per Hume, free trade between nations was made advantageous by the outcome of:

(A) mutual increases in riches and commerce.

(B) emulation of industrial activity by different nations.

(C) affable promotion of industrial activity among nations.

(D) productive employment of labour in different nations.

Correct Answer: (B) emulation of industrial activity by different nations.

SOLUTION:

Step 1: Understanding the Question:
The question asks what outcome, according to Hume, made free trade between nations advantageous. We need the driving cause, not the resulting benefit, since the phrase made advantageous by the outcome of is pointing at a mechanism, not a description of the advantage itself.

Step 2: Key Approach:
Separate the two ideas in the passage, the benefit, a mutual rise in riches and commerce, and the cause of that benefit, rivalry between nations. Match the option to the cause, since that is what the question asks for, and treat any option that only restates the benefit as a trap.

Step 3: Detailed Explanation:
The passage's last line says the emulation, that is, rivalry, in rival nations serves to keep industry alive in all of them. This rivalry is what keeps each nation producing and trading hard, which then leads to the mutual rise in riches described earlier.
Option 1, mutual increases in riches and commerce, is the effect, not the cause, so it does not answer what made trade advantageous; it is a restatement, not an explanation. Option 3 wrongly turns rivalry into friendly cooperation, which the passage never claims, since emulation implies competing to keep up, not being affable.
Option 4 brings in productive labour, a separate idea from an earlier part of the passage that is not linked here to trade's advantage.
Only option 2, emulation of industrial activity between nations, is the actual cause Hume names for why trade helps every nation involved.

Step 4: Final Answer:
Free trade was made advantageous by the emulation of industrial activity among different nations, so option 2 is correct.

Quick Tip: Look for the cause behind the mutual benefit, the rivalry or emulation between nations, not the benefit itself.

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3. Identify the correct sentence from the options given below.

(A) When kite flying you can always tell when you lose a kite because the string feels loose.

(B) When kite flying you can always tell when you loose a kite because the string feels lose.

(C) When kite flying you can always tell when you loose a kite because the string feels loose.

(D) When flying a kite, you can, always tell when you lose a kite because the string feels lose.

Correct Answer: (A) When kite flying you can always tell when you lose a kite because the string feels loose.

SOLUTION:

Step 1: Understanding the Concept:
This question checks the difference between lose, a verb meaning to misplace, and loose, an adjective meaning slack or not tight. Getting these two words right in the same sentence is the whole test, since the four options only differ in how these two words are placed.

Step 2: Key Approach:
Read each option and mark where a verb is needed and where an adjective is needed. The verb slot, losing the kite, needs lose; the adjective slot, how the string feels, needs loose. Checking both slots in every option will quickly rule out the wrong ones.

Step 3: Detailed Explanation:
Option A places lose at the verb slot, tell when you lose a kite, and loose at the adjective slot, the string feels loose, matching both rules at once.
Option B reverses both, using loose as a verb, when you loose a kite, and lose as an adjective, the string feels lose, so both slots are wrong.
Option C fixes the adjective, feels loose, but still uses loose where the verb lose belongs, when you loose a kite, so one slot is still wrong.
Option D gets the verb right, you lose a kite, but uses lose again for the adjective slot, feels lose, and adds a stray comma after you can that breaks the sentence rhythm.
Only option A satisfies both the verb and the adjective correctly, with no extra punctuation problems either.

Step 4: Final Answer:
Option A is the grammatically correct sentence, since it is the only one using both lose and loose in their right roles.

Quick Tip: Lose is the verb, to misplace; loose is the adjective, slack. Only one option uses both correctly.

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4. Identify the correct sentence from the options given below.

(A) If XAT aspirants had not taken so long checking each question before attempting the next question they might not have run out of time.

(B) If XAT aspirants had taken so long checking each question before attempting the next question they might not have run out of time.

(C) Had XAT aspirants not took so long checking every question before attempting the next question they might not have run out of time.

(D) If XAT aspirants had took so long checking each and every question before attempting the next question they might not have run out of time.

Correct Answer: (A) If XAT aspirants had not taken so long checking each question before attempting the next question they might not have run out of time.

SOLUTION:

Step 1: Understanding the Concept:
This is a third conditional sentence about an imagined change to a past event. It needs the correct past participle after had and a logic that actually connects cause and effect, since a conditional can be grammatically neat and still make no sense.

Step 2: Key Approach:
First eliminate any option using the wrong verb form, took instead of taken, after had. Then, among the survivors, check whether not is placed so the sentence's meaning makes sense, since a missing or misplaced not can flip the whole logic of a conditional.

Step 3: Detailed Explanation:
Options C and D both use had took, checking every question and each and every question respectively, which is wrong; the correct past participle of take is taken, so both are eliminated purely on grammar, before we even look at their logic.
That leaves options A and B, which both use had, not, taken correctly in form. Option B drops the word not, which makes it read as if taking a long time helped avoid running out of time, an illogical claim, since taking long on each question is naturally what causes time to run out, not what prevents it. Option A keeps not, so it reads, they did not take too long, so they might not have run out of time, meaning the actual cause of running out of time was taking too long on each question in the first place. This matches how the sentence is clearly meant to be read.

Step 4: Final Answer:
Option A is both grammatically correct, had not taken, and logically sound, so it is the right choice, while options B, C, and D each fail on either grammar or logic.

Quick Tip: Use had taken, never had took, and check that the placement of not keeps the cause and effect logical.

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5. Identify the correct sentence from the options given below.

(A) The news channel agreed to report that next Sunday the couple had been married for 10 years.

(B) The news channel agreed to report that next Sunday the couple will have been married for 10 years.

(C) The news channel agreed to report that next Sunday the couple will be married for 10 years.

(D) The news channel agreed to report that next Sunday the couple could have been married for 10 years.

Correct Answer: (B) The news channel agreed to report that next Sunday the couple will have been married for 10 years.

SOLUTION:

Step 1: Understanding the Concept:
The sentence needs a tense that shows a state, being married, reaching a fixed duration, 10 years, by a specific future date, next Sunday. This is a classic trigger for the future perfect, so each option should be checked against that need.

Step 2: Key Approach:
The future perfect tense, will have been plus past participle, is used exactly for this, something ongoing that will be complete, or will have reached a stated point, by a future time. Any option using a different tense is likely shifting the meaning away from what the sentence intends.

Step 3: Detailed Explanation:
Option 1 uses the past perfect had been married, which looks back from a past point in time, not forward to next Sunday, so it does not fit a sentence anchored to a future time reference.
Option 3 uses simple future will be married, which suggests the marriage or its duration starts at that future point, not that it will have already lasted 10 years by then, changing the meaning of the sentence.
Option 4 uses could have been married, which expresses doubt or possibility about whether the marriage happened at all, while the sentence intends a definite, agreed fact for the news report.
Option 2, will have been married for 10 years, correctly uses future perfect to show the marriage will have run for a full 10 years by the time next Sunday arrives.

Step 4: Final Answer:
Option 2 is the grammatically correct sentence, using future perfect for a state completing 10 years by a future date, while the other three options each shift the tense or meaning incorrectly.

Quick Tip: A state lasting up to a future date needs the future perfect, will have been married, not past perfect or simple future.

6. Read the following passage and answer the question that follows.

The Yoga system is divided into two principal parts, Hatha and Raja Yoga. Hatha Yoga deals principally with the physiological part of man with a view to establish his health and train his will. The processes prescribed to arrive at this end are so difficult that only a few resolute souls go through all the stages of its practice. Many have failed and some have died in the attempt. It is therefore strongly denounced by all the philosophers. The most illustrious Shankaracharya has remarked in his treatise called Aparokshanubhuti that 'the system of Hatha Yoga was intended for those whose worldly desires are not pacified or uprooted.'

Which one of the following, if true, most substantially strengthens the idea given in the passage?

(A) The percentage of people in a given ashram practicing Raja Yoga is more than the percentage of people practicing Hatha Yoga.

(B) The number of people in a given ashram practicing Raja Yoga is more than the number of people practicing Hatha Yoga.

(C) The number of Yoga schools teaching Raja Yoga is more than the number of Yoga schools teaching Hatha Yoga.

(D) The percentage of students who have successfully learnt Raja Yoga is more than the percentage of students who have successfully learnt Hatha Yoga.

Correct Answer: (D) The percentage of students who have successfully learnt Raja Yoga is more than the percentage of students who have successfully learnt Hatha Yoga.

SOLUTION:

Step 1: Understanding the Concept:
The passage argues that Hatha Yoga's practice is so hard that very few people who attempt it actually complete all its stages, with many failing and some even dying in the attempt. We must find the option that best supports this specific claim about difficulty and outcome, not just any fact loosely connected to Yoga.

Step 2: Key Approach:
A strengthener for a claim of this is very difficult, few succeed, must talk about success or completion rates, not about how many people try it, how many schools exist, or how many teachers are available, since those numbers can be high or low for reasons unrelated to difficulty.

Step 3: Detailed Explanation:
Option A and option B both talk about how many people practice Raja Yoga versus Hatha Yoga, in percentage or raw number form respectively. Both describe participation or popularity, not outcome, so neither confirms that Hatha Yoga is actually harder to succeed at, people might simply prefer one over the other for unrelated reasons.
Option C talks about the number of schools teaching each style, which reflects demand for teaching or how widely a style is offered, not the difficulty of mastering it once someone starts.
Option D compares the percentage of students who actually succeeded, completed, at Raja Yoga against Hatha Yoga. If Raja Yoga's success percentage is higher, that directly means Hatha Yoga's success percentage is lower, which is exactly the kind of evidence that supports the passage's claim that Hatha Yoga is uniquely hard to complete.

Step 4: Final Answer:
The option that strengthens the passage is the one comparing success percentages, since it directly supports the

claim that Hatha Yoga's processes are unusually difficult to complete, unlike the other three options which only measure participation or availability.

Quick Tip: The passage is about difficulty and success in completing the practice, so the strengthener must compare success rates, not participation numbers.

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7. Read the following passage and answer the question that follows.

The Yoga system is divided into two principal parts, Hatha and Raja Yoga. Hatha Yoga deals principally with the physiological part of man with a view to establish his health and train his will. The processes prescribed to arrive at this end are so difficult that only a few resolute souls go through all the stages of its practice. Many have failed and some have died in the attempt. It is therefore strongly denounced by all the philosophers. The most illustrious Shankaracharya has remarked in his treatise called Aparokshanubhuti that 'the system of Hatha Yoga was intended for those whose worldly desires are not pacified or uprooted.'

Which of the following options best reflects Shankaracharya's comments on Hatha Yoga?

(A) Hatha Yoga is for those whose worldly desires are not placated.

(B) Hatha Yoga has disastrous consequences for Yoga practitioners.

(C) Practiced under the guidance of experts, Hatha Yoga is better than Raja Yoga for some people.

(D) Raja Yoga gives better results and in a shorter time period for most people, and therefore it should be encouraged.

Correct Answer: (A) Hatha Yoga is for those whose worldly desires are not placated.

SOLUTION:

Step 1: Understanding the Concept:
The question is about one specific line, Shankaracharya's own quoted comment on Hatha Yoga, not the passage's general remarks about difficulty or failure that come from the author, not from Shankaracharya.

Step 2: Key Approach:
Isolate the direct quote, the system of Hatha Yoga was intended for those whose worldly desires are not pacified or uprooted. Then find the option that means the same thing, in different words, and reject any option that pulls in facts from elsewhere in the passage instead.

Step 3: Detailed Explanation:
Option B describes practitioners failing or dying, which the passage states earlier as a general fact about the difficulty of Hatha Yoga, separate from Shankaracharya's quoted line, so it does not reflect his comment specifically, even though it sounds plausible.
Option C introduces expert guidance and a comparison favouring Hatha Yoga over Raja Yoga, an idea absent from both the passage and the quote, and effectively invented for this option.
Option D claims Raja Yoga is faster and better for most people and should therefore be encouraged, again an opinion never voiced anywhere in the passage.
Option A says Hatha Yoga is for those whose worldly desires are not placated, and placated means the same as pacified in Shankaracharya's quote, so this option is a direct, close paraphrase of his actual words.

Step 4: Final Answer:
Option A best reflects Shankaracharya's comment, since it paraphrases his exact statement that Hatha Yoga suits those whose worldly desires remain unpacified, while the other options bring in ideas from elsewhere or invent new claims.

Quick Tip: Match the option to Shankaracharya's exact quoted line, not to the passage's general remarks about failure.

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8. Read the following passage and answer the question below.

The greens' success has clear policy implications, especially on issues of nuclear power, ecological tax reform, and citizenship rights. But success also has implications for parties themselves. Greens have always faced a unique 'strategic conundrum' arising from their unique beliefs and movement roots. Put simply, how can they reconcile their radical alternative politics with participation in mainstream or 'grey' parliamentary and government structures? Throughout the 1990s most parties shed their radical cloth in an attempt to capture votes, even at the expense of party unity and purity. Most were rewarded with electoral success well beyond what had been imaginable in the 1980s. The price to pay has been tortured internal debates about strategy, and new questions about green party identity and purpose. Today the key questions facing green parties revolve around not whether to embrace power, but what to do with it. More specifically, green parties face three new challenges in the new millennium: first, how to carve out a policy niche as established parties and governments become wiser to green demands, and as green concerns themselves appear more mainstream. Second, how to make green ideas spread beyond the confines of rich industrialised states into Eastern Europe and the developing world, where green parties remain marginal and environmental problems acute. Third, how to ensure that the broader role of green parties, as consciousness raisers, agitators, conscience of parliament and politics, is not sacrificed on the altar of electoral success. Green parties have come a long way since their emergence and development in the 1970s and 1980s. They have become established players able to shape party competition, government formation, and government policy. But this very 'establishment' carries risk for a party whose core values and identities depend mightily on their ability to challenge the conventional order, to agitate and to annoy. For most green parties, the greatest fear is not electoral decline so much as the prospect of becoming a party with parliamentary platform, ministerial voice, but nothing to say.

Question: Which out of the following is closest in meaning to the first three challenges mentioned in the paragraph?

(A) Niche of green parties is being eroded by mainstream parties.
(B) Green parties are finding it difficult to find new strategy.
(C) Green parties have become stronger over a period of time.
(D) Some green parties are becoming grey.

Correct Answer: (A) Niche of green parties is being eroded by mainstream parties.

SOLUTION:

A fast way to answer this is to name the three challenges in one line each, then ask what single idea ties them together.

Challenge one: green parties must protect a policy niche as mainstream players catch up on green demands. Challenge two: green ideas need to spread past rich, industrialised nations. Challenge three: the party must keep its

agitator role even after entering government. Line these up and a pattern appears: in each case the pressure comes from mainstream structures and parties absorbing or limiting what used to be exclusively green territory.

Now test the four options against that pattern. Green parties finding it difficult to find new strategy describes the aftermath of the 1990s shift, a separate point in the passage. Green parties becoming stronger over time only reflects past electoral gains, it says nothing about a threat. Some green parties becoming grey is about joining mainstream government, which is only part of the third challenge, not all three together. Only the erosion of the green niche by mainstream parties captures what all three challenges share.

So the option that best matches the combined sense of the three challenges is the erosion of the green niche by the mainstream.

Quick Tip: Look for the option that captures the shared thread across all three challenges: a shrinking, distinct space for green parties.

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9. Read the following passage and answer the question below.

The greens' success has clear policy implications, especially on issues of nuclear power, ecological tax reform, and citizenship rights. But success also has implications for parties themselves. Greens have always faced a unique 'strategic conundrum' arising from their unique beliefs and movement roots. Put simply, how can they reconcile their radical alternative politics with participation in mainstream or 'grey' parliamentary and government structures? Throughout the 1990s most parties shed their radical cloth in an attempt to capture votes, even at the expense of party unity and purity. Most were rewarded with electoral success well beyond what had been imaginable in the 1980s. The price to pay has been tortured internal debates about strategy, and new questions about green party identity and purpose. Today the key questions facing green parties revolve around not whether to embrace power, but what to do with it. More specifically, green parties face three new challenges in the new millennium: first, how to carve out a policy niche as established parties and governments become wiser to green demands, and as green concerns themselves appear more mainstream. Second, how to make green ideas spread beyond the confines of rich industrialised states into Eastern Europe and the developing world, where green parties remain marginal and environmental problems acute. Third, how to ensure that the broader role of green parties, as consciousness raisers, agitators, conscience of parliament and politics, is not sacrificed on the altar of electoral success. Green parties have come a long way since their emergence and development in the 1970s and 1980s. They have become established players able to shape party competition, government formation, and government policy. But this very 'establishment' carries risk for a party whose core values and identities depend mightily on their ability to challenge the conventional order, to agitate and to annoy. For most green parties, the greatest fear is not electoral decline so much as the prospect of becoming a party with parliamentary platform, ministerial voice, but nothing to say.

Question: Which of the following is the most important point that the author highlights?

(A) Challenges before green parties to change their strategy from green activism to green governance.

(B) How should green parties win confidence and support of governments?

(C) Transformation of green parties in recent decades.

(D) Green movement is not strong in developing countries.

Correct Answer: (A) Challenges before green parties to change their strategy from green activism to green governance.

SOLUTION:

Sort the options by whether they state a supporting detail or the actual argument of the passage. Transformation of green parties in recent decades and green movement not being strong in developing countries are both details used to build the case, past growth and geographic limits, not the point the passage is arguing for. How should green parties win confidence and support of governments does not even match the passage, which treats green parties as parties in government, not as outsiders seeking government approval.

That leaves one option standing. The passage's real thread runs from success having implications for parties themselves, through the strategic conundrum, to the closing worry about becoming a party with parliamentary platform and ministerial voice but nothing to say. Every part of that thread is about the same shift: moving from activist outsider to governing insider, and the difficulty of doing that without losing what made the party distinct.

Because that shift, from green activism to green governance, is the thread tying the whole passage together, it is the most important point the author makes.

Quick Tip: Find the sentence that the whole passage is building toward, not just one supporting detail from it.

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10. Read the following passage and answer the question below.

The greens' success has clear policy implications, especially on issues of nuclear power, ecological tax reform, and citizenship rights. But success also has implications for parties themselves. Greens have always faced a unique 'strategic conundrum' arising from their unique beliefs and movement roots. Put simply, how can they reconcile their radical alternative politics with participation in mainstream or 'grey' parliamentary and government structures? Throughout the 1990s most parties shed their radical cloth in an attempt to capture votes, even at the expense of party unity and purity. Most were rewarded with electoral success well beyond what had been imaginable in the 1980s. The price to pay has been tortured internal debates about strategy, and new questions about green party identity and purpose. Today the key questions facing green parties revolve around not whether to embrace power, but what to do with it. More specifically, green parties face three new challenges in the new millennium: first, how to carve out a policy niche as established parties and governments become wiser to green demands, and as green concerns themselves appear more mainstream. Second, how to make green ideas spread beyond the confines of rich industrialised states into Eastern Europe and the developing world, where green parties remain marginal and environmental problems acute. Third, how to ensure that the broader role of green parties, as consciousness raisers, agitators, conscience of parliament and politics, is not sacrificed on the altar of electoral success. Green parties have come a long way since their emergence and development in the 1970s and 1980s. They have become established players able to shape party competition, government formation, and government policy. But this very 'establishment' carries risk for a party whose core values and identities depend mightily on their ability to challenge the conventional order, to agitate and to annoy. For most green parties, the greatest fear is not electoral decline so much as the prospect of becoming a party with parliamentary platform, ministerial voice, but nothing to say.

Question: How best can mainstream political parties, in India, keep green parties at bay?

(A) By imposing a green tax.

(B) By allowing carbon trading.

(C) By including green agenda in their governance.

(D) By hiring Al Gore, the Nobel prize winner, as an ambassador.

Correct Answer: (C) By including green agenda in their governance.

SOLUTION:

Work backward from what a green party actually offers voters: a distinct green policy agenda that mainstream parties are not seen to be delivering. Any answer that closes that gap is the strongest choice.

A green tax and carbon trading are both single instruments, useful policy tools, but narrow. A green party can still say it would go further than this one measure, so its niche survives. Hiring a celebrity ambassador changes image, not substance, so it does not touch the actual policy gap at all.

Only including the green agenda in governance removes the gap itself. If mainstream parties are seen to be already governing on environmental concerns, voters have less reason to back a separate party for the same cause, which is the passage's own point about green parties losing their niche as established parties become wiser to green demands.

So the option that most fully closes the gap a green party depends on is mainstream parties folding the green agenda into their own governance.

Quick Tip: Think about what removes the reason for a separate green party to exist, rather than what merely competes with it on one issue.

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11. Read the following passage and answer the question below.

The Sapir-Whorf hypothesis, also known as the linguistic relativity hypothesis, refers to the proposal that the particular language one speaks influences the way one thinks about reality. The linguistic relativity hypothesis focuses on structural differences among natural languages such as Hopi, Chinese, and English, and asks whether the classifications of reality implicit in such structures affect our thinking about reality. Analytically, linguistic relativity as an issue stands between two others: a semiotic-level concern with how speaking any natural language whatsoever might influence the general potential for human thinking, and a functional or discourse-level concern with how using any given language code in a particular way might influence thinking, that is, the impact of special discursive practices such as schooling and literacy on formal thought. Although analytically distinct, the three issues are intimately related in both theory and practice. For example, claims about linguistic relativity depend on understanding the general psychological mechanisms linking language to thinking, and on understanding the diverse uses of speech in discourse to accomplish acts of descriptive reference. Hence, the relation of particular linguistic structures to patterns of thinking forms only one part of the broader array of questions about the significance of language for thought. Proposals of linguistic relativity necessarily develop two linked claims among the key terms of the hypothesis, language, thought, and reality. First, languages differ significantly in their interpretations of experienced reality, both what they select for representation and how they arrange it. Second, language interpretations have influences on thought about reality more generally, whether at the individual or cultural level. Claims for linguistic relativity thus require both articulating the contrasting interpretations of reality latent in the structures of different languages, and accessing their broader influences on, or relationships to, the cognitive interpretation of reality.

Question: Which of the following conclusions can be derived based on the Sapir-Whorf hypothesis?

(A) Americans and Indians would have similar intelligence.

(B) South Indians and North Indians would have similar intelligence.

(C) Those with same intelligence would speak the same language.

(D) Those with similar intelligence may speak the same language.

Correct Answer: (D) Those with similar intelligence may speak the same language.

SOLUTION:

The Sapir-Whorf hypothesis only says one thing: the structure of the language you speak affects how you think about reality. It does not equate thinking with intelligence, and it never claims that people who think alike are forced to speak the same language.

1. **Americans and Indians would have similar intelligence**: Americans largely share one language while India has many languages, so the hypothesis predicts different thought patterns between the two groups, not similar intelligence, and intelligence itself is never part of the hypothesis.
2. **South Indians and North Indians would have similar intelligence**: the same problem applies here, these groups speak different language families, so this option both misuses intelligence and ignores the very language differences the hypothesis is built on.
3. **Those with same intelligence would speak the same language**: this flips the hypothesis around, claiming a mental trait forces a shared language. The passage never argues in this direction, and the word 'would' asserts far more certainty than the hypothesis allows.
4. **Those with similar intelligence may speak the same language**: 'may' is doing the work here. It only opens up a possibility instead of demanding one, so it does not contradict the hypothesis or force a reversed cause onto it.

Because option 4 is worded as a mere possibility rather than a rule, it is the one conclusion that can be said to follow, at least loosely, without overstepping what the hypothesis actually claims.

Quick Tip: Watch how strongly each option states its claim: a hypothesis about influence supports a cautious possibility, not a firm certainty.

12. Read the following passage and answer the question below.

The Sapir-Whorf hypothesis, also known as the linguistic relativity hypothesis, refers to the proposal that the particular language one speaks influences the way one thinks about reality. The linguistic relativity hypothesis focuses on structural differences among natural languages such as Hopi, Chinese, and English, and asks whether the classifications of reality implicit in such structures affect our thinking about reality. Analytically, linguistic relativity as an issue stands between two others: a semiotic-level concern with how speaking any natural language whatsoever might influence the general potential for human thinking, and a functional or discourse-level concern with how using any given language code in a particular way might influence thinking, that is, the impact of special discursive practices such as schooling and literacy on formal thought. Although analytically distinct, the three issues are intimately related in both theory and practice. For example, claims about linguistic relativity depend on understanding the general psychological mechanisms linking language to thinking, and on understanding the diverse uses of speech in discourse to accomplish acts of descriptive reference. Hence, the relation of particular linguistic structures to patterns of thinking forms only one part of the broader array of questions about the significance of language for thought. Proposals of linguistic relativity necessarily develop two linked claims among the key terms of the hypothesis, language, thought, and reality. First, languages differ significantly in their interpretations of experienced reality, both what they select for representation and how they arrange it. Second, language interpretations have influences on thought about reality more generally, whether at the individual or cultural level. Claims for linguistic relativity thus require both articulating the contrasting interpretations of reality latent in the structures of different languages, and accessing their broader influences on, or relationships to, the cognitive interpretation of reality.

Question: If the Sapir-Whorf hypothesis were to be true, which of the following conclusions would logically follow?
1. To develop vernacular languages, government should promote public debates and discourses.
2. Promote vernacular languages as medium of instruction in schools.
3. Cognitive and cultural realities are related.

(A) 1 only

(B) 2 only

(C) 3 only

(D) 1 and 2

Correct Answer: (C) 3 only

SOLUTION:

Before checking the three statements, separate two different kinds of sentence: a factual claim that follows from the hypothesis, and a policy opinion about what someone should do. Only the first kind can be said to logically follow from a hypothesis about how language and thought relate.

1. **Statement 1, government should promote public debates for vernacular languages**: this recommends an action. The hypothesis describes a relationship between language and thought, it does not tell any government what policies to adopt, so this is an opinion layered on top of the hypothesis, not a consequence of it.
2. **Statement 2, vernacular languages as medium of instruction**: same issue, this is a should statement about schooling policy. Even if it sounds reasonable given the hypothesis, it is not something the hypothesis itself asserts.
3. **Statement 3, cognitive and cultural realities are related**: language is part of a culture, and thought is a cognitive process. The hypothesis's entire claim is that the language a culture uses shapes how its speakers

think, which is exactly a claim that cultural and cognitive realities are linked. This statement is just the hypothesis restated at a general level.

Since 1 and 2 are policy opinions and only 3 restates the hypothesis itself, the only statement that truly follows is statement 3, giving 3 only as the answer.

Quick Tip: Separate prescriptive policy suggestions from statements that are pure logical consequences of the hypothesis.

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13. Read the following passage and answer the question below.

The Sapir-Whorf hypothesis, also known as the linguistic relativity hypothesis, refers to the proposal that the particular language one speaks influences the way one thinks about reality. The linguistic relativity hypothesis focuses on structural differences among natural languages such as Hopi, Chinese, and English, and asks whether the classifications of reality implicit in such structures affect our thinking about reality. Analytically, linguistic relativity as an issue stands between two others: a semiotic-level concern with how speaking any natural language whatsoever might influence the general potential for human thinking, and a functional or discourse-level concern with how using any given language code in a particular way might influence thinking, that is, the impact of special discursive practices such as schooling and literacy on formal thought. Although analytically distinct, the three issues are intimately related in both theory and practice. For example, claims about linguistic relativity depend on understanding the general psychological mechanisms linking language to thinking, and on understanding the diverse uses of speech in discourse to accomplish acts of descriptive reference. Hence, the relation of particular linguistic structures to patterns of thinking forms only one part of the broader array of questions about the significance of language for thought. Proposals of linguistic relativity necessarily develop two linked claims among the key terms of the hypothesis, language, thought, and reality. First, languages differ significantly in their interpretations of experienced reality, both what they select for representation and how they arrange it. Second, language interpretations have influences on thought about reality more generally, whether at the individual or cultural level. Claims for linguistic relativity thus require both articulating the contrasting interpretations of reality latent in the structures of different languages, and accessing their broader influences on, or relationships to, the cognitive interpretation of reality.

Question: Which of the following proverbs may be false, if the above passage were to be right?
1. If speech is silver, silence is gold.
2. When you have spoken a word, it reigns over you. When it is unspoken you reign over it.
3. Speech of yourself ought to be seldom and well chosen.

(A) 1 and 2

(B) 2 and 3

(C) 3 only

(D) 1 only

Correct Answer: (A) 1 and 2

SOLUTION:

Step 1: Understanding the Concept:
The passage argues that the language a person uses actively shapes their thinking about reality, meaning speech and language are not neutral, they are the tool of cognition itself. A proverb becomes shaky under this idea if it says

silence is worth more than speech.

Step 2: Key Formula or Approach:
Read each proverb and ask a single question: does it claim silence beats speech, or does it only ask for careful speech? Only the first kind clashes with a passage that gives language, spoken or written, the central role in shaping thought.

Step 3: Detailed Explanation:
Proverb 1, if speech is silver, silence is gold, directly ranks silence above speech in value. This contradicts a passage where language use is the active means of interpreting reality, so it may be false.
Proverb 2 says a spoken word reigns over you while an unspoken one leaves you reigning over it, again treating silence as the position of strength and speech as a loss of control. This clashes with the same idea, so it may also be false.
Proverb 3 only asks that self-talk be seldom and well chosen. It does not claim silence is superior to speech, it just recommends selectivity, so it stays consistent with a passage that treats language as valuable when used, and is not threatened by it.

Step 4: Final Answer:
Proverbs 1 and 2 both rank silence over speech and so may be false under the passage's hypothesis, while proverb 3 is unaffected.

1 and 2

Quick Tip: Check whether each proverb rates silence above speech in a way that clashes with the idea that language shapes thought.

14. Read the following passage and answer the question below.

Demography of organisations, also called population ecology, is an interesting field. It proposes that organisational mortality processes depend upon the age and size of the organisation, as well as on characteristics of populations and environments. Moreover, there is evidence of an imprinting process, meaning that environmental conditions at certain early phases in an organisation's development have long-term consequences. In particular, organisations subject to intense competition have elevated mortality hazards at all ages. A central theme is structural inertia, the tendency for organisations to respond slowly relative to the speed of environmental change. A central argument holds that the inertia derives from the very characteristics that make organisations favoured actors in modern society in terms of reliability and formal accountability. It follows that changes in an organisation's core features are disruptive and increase mortality hazards, at least in the short run. Research on this subject tends to support this view. The concept of niche provides a framework of relative environmental variations and competition to population dynamics and segmentation. Much empirical work examines the niches of organisational populations in terms of dimensions of social, political, and economic environments. Most research in this field builds on theories of resource partition and of density dependence. Resource-partitioning theory concerns the relationship between increasing market concentration and increasing proliferation of specialists in mature industries. The key implication of this theory concerns the effects of concentration on the viability of specialist organisations, those that seek to exploit a narrow range of resources. The theory of density-dependent organisational evolution synthesizes ecological and institutional processes. It holds that growth in the number of organisations in a population, density, drives processes of social legitimatisation and competition that, in turn, shape the vital rates.

Question: Most top-notch business consultants recommended changing the entire configuration of an organisation's strategy, structure and systems. If the ideas contained in the passage are agreed to, then such a recommendation:

(A) tends to rejuvenate the organisation.

(B) tends to make the organisation more aligned to the external environment.

(C) tends to increase the competitiveness of the organisation by redefining its core competence.

(D) tends to increase the vulnerability of the organisation.

Correct Answer: (D) tends to increase the vulnerability of the organisation.

SOLUTION:

The passage builds its whole argument around structural inertia, the idea that organisations survive partly because they change slowly, and that fast, sweeping change to their core features works against this survival mechanism. It says outright that changing core features is disruptive and raises mortality hazards in the short run. Changing strategy, structure, and systems all at once is about as complete a change to core features as an organisation can undergo.

1. **Tends to rejuvenate the organisation**: this treats sweeping change as a cure, but the passage frames this exact kind of change as a disruption and a risk, not a source of renewal.
2. **Tends to make the organisation more aligned to the external environment**: this assumes the change will succeed at realigning the firm with its environment. The passage never promises this outcome, it only flags the danger the attempt itself creates.
3. **Tends to increase competitiveness by redefining core competence**: again this assumes a positive outcome from redefining the core, which is the opposite of what the passage's evidence on mortality hazards supports.

4. **Tends to increase the vulnerability of the organisation**: this is the one option that matches the passage's own claim directly, disruptive change to core features raises mortality hazards, in other words, it makes the organisation more vulnerable, at least in the short run.

Since the passage links change in core features to raised mortality hazards rather than to any guaranteed improvement, the recommendation to overhaul strategy, structure, and systems together would make the organisation more vulnerable, not stronger.

Quick Tip: Connect the recommendation to the passage's idea of structural inertia and what happens when core features change all at once.

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15.

Consider the following:

"Tata Steel, one of the biggest steel makers in the world, was born in Jamshedpur."

If the above passage is true, then it can be concluded that the location of Tata Steel has been one of the reasons for its success.

1. The conclusion is false.
2. This is a farfetched conclusion.
3. This is a valid conclusion.

(A) 1 only

(B) 2 only

(C) 3 only

(D) 1 and 2

Correct Answer: (C) 3 only

SOLUTION:

The question gives one fact: Tata Steel was born in Jamshedpur. It then asks if we can conclude that this location helped the company succeed.

1. **The conclusion is false**: this would mean location played no part in the firm's success. Since Jamshedpur was picked for its closeness to iron ore and coal, the basic inputs of steel making, this option goes against the evidence rather than matching it.
2. **This is a farfetched conclusion**: a farfetched idea needs a long chain of shaky guesses. Here the chain is short and well known: raw material access lowers cost, lower cost supports faster growth, growth supports scale. That is not a stretch at all.
3. **This is a valid conclusion**: given how directly raw material access supports an industrial firm's early growth and later scale, treating location as one of the reasons for success is a fair, supportable reading of the given fact.

The third statement stands on its own, so the answer is "3 only".

Let's summarize:

- A conclusion is valid when it follows sensibly from the given fact, even without being stated outright.
- Location near key raw materials is a standard, direct driver of industrial success, not a distant or unlikely one.

So the correct choice is option C, "3 only".

Quick Tip: Check whether the reason given (location near raw materials) is a sensible, supportable step from the stated fact, or if it needs too many extra assumptions.

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16.

"Tata Steel, one of the biggest steel makers in the world, was born in Jamshedpur. The very success of Tata Steel could lead to its failure in the future and hence the challenge for Tata Steel is to recognise its strengths that make it successful in initial conditions and stick to them."

1. This is a valid conclusion.
2. The conclusion is contrary to the ideas described in the passage.
3. This is an internally contradictory conclusion.

(A) 1 only

(B) 2 only

(C) 3 only

(D) 1 and 2

Correct Answer: (C) 3 only

SOLUTION:

The passage warns that Tata Steel's success could turn into failure, and then advises the firm to hold onto the strengths that worked in its early days.

1. **This is a valid conclusion**: for this to be true, the advice would need to actually solve the problem the passage names. Since the advice tells the firm to repeat the very behaviour (clinging to old strengths) that can cause success to turn into failure, it does not solve the problem, so calling it simply valid misses the flaw.
2. **The conclusion is contrary to the ideas described in the passage**: this would mean the conclusion disagrees with something the passage says elsewhere. But the clash here is not with outside ideas, it is with its own opening warning, so this label does not fit either.
3. **This is an internally contradictory conclusion**: the passage first says success can breed failure, most often because firms stop adapting, and then tells the firm to stick rigidly to its original strengths. Sticking rigidly to old strengths is exactly the kind of behaviour that stops a firm from adapting. So the advice fights against the warning it follows, which is a textbook internal contradiction.

The internal contradiction is the accurate reading, so the answer is "3 only".

Let's summarize:

- An internally contradictory conclusion recommends the very thing its own warning cautions against.
- Clinging to old strengths without adapting is a classic route by which past success turns into future failure.

So the correct choice is option C, "3 only".

Quick Tip: Compare the warning ("success could lead to failure") with the fix suggested ("stick to the same old strengths") and see whether the two sit together logically.

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17.

Recently it was reported that the Indian textile sector was not doing well. If the ideas contained in the passage are agreed to, then which of the following could be a possible reason?

1. All Indian firms are as old as international firms.
2. Indian textile firms are dispersed all over the country, with most of them also having an international presence.
3. Textile firms in India were subjected to trade union activity in the period from the 1960s to the 1980s.

(A) 1

(B) 2

(C) 3

(D) 1 and 2

Correct Answer: (C) 3

SOLUTION:

We need a fact that could genuinely explain why the Indian textile sector has been struggling.

1. **All Indian firms are as old as international firms**: age alone says nothing about performance. A firm's vintage does not, by itself, explain why an entire sector would be doing poorly, so this fact does not answer the question.
2. **Indian textile firms are dispersed across the country, many with an international presence**: being spread out and having a foreign footprint are usually strengths, they widen a firm's market and reduce its dependence on any one region. This would help performance, not hurt it, so it cannot explain a decline.
3. **Textile firms faced trade union activity from the 1960s to the 1980s**: sustained labour unrest over two decades means frequent strikes, lost production days, and reluctance to invest in new machinery. Costs rise, output falls, and the sector loses ground to competitors who did not face the same disruption. This is a direct, well known cause of long term decline.

Only the trade union history plausibly explains the sector's poor performance, so the answer is "3".

Let's summarize:

- A cause of decline must actually work against performance, not sit neutral or help it.
- Long spells of labour unrest are a classic, well documented drag on an industry's competitiveness.

So the correct choice is option C, "3".

Quick Tip: Ask which fact would actually drag performance down over decades, not which fact is merely neutral or would normally help a firm.

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18.

Read the following passage and answer the question below.

"Since power is itself a value, forms of influence which include power in their scope are usually themselves forms of power. The king's mistress, though she has only influence, not power, over the king, may have power over his subjects in the degree of that influence. Forms of influence based on power are themselves forms of power only if the scope of the influence is included within that of the power in question. The king may exercise influence over standards of morality, say, by virtue of his power position, but he does not necessarily exercise power over morality."

Which combination of the following statements best summarises the idea expressed in the paragraph?

1. Strength of an influence determines its power.
2. Influence always contributes power to the wielder of influence beyond the scope of influence.
3. Proximity to authority is itself a source of power.
4. Forms of influence are power only if they can influence behaviour.

(A) 1, 2

(B) 1, 3

(C) 1, 4

(D) 1, 3, 4

Correct Answer: (C) 1, 4

SOLUTION:

The passage's rule is this: an influence becomes a form of power only when its scope, its reach, is contained within the scope of the power being talked about. The king's influence over morality never becomes power over morality because morality is bigger than what his position controls.

1. **Strength of an influence determines its power**: reading "strength" as the reach of the influence, this is just the passage's rule in other words, the wider or narrower reach of the influence decides whether, and how far, it counts as power.
2. **Influence always contributes power to the wielder beyond the scope of influence**: the passage never says influence spills over its own scope automatically, it says the opposite, that influence is power only inside the matching scope. This statement flips the passage's rule around.
3. **Proximity to authority is itself a source of power**: the mistress example directly rejects this. Her power over the subjects tracks the actual degree of influence she exercises, not how close she physically or socially sits to the king. Closeness by itself gives nothing.
4. **Forms of influence are power only if they can influence behaviour**: this is the same rule stated in terms of outcomes, an influence only turns into power when it can actually shape what people do within the relevant domain, which is exactly why the king's influence over morality does not amount to power over morality.

Statements 1 and 4 both restate the passage's rule correctly, while 2 and 3 contradict it, so the best combination is "1, 4".

Let's summarize:

- Influence becomes power only when its reach matches the scope of the power in question.

- Nearness to authority and automatic spillover of influence are both explicitly ruled out by the passage's own example.

So the correct choice is option C, "1, 4".

Quick Tip: Find the passage's exact rule (influence is power only if its scope matches the power's scope) and match statements against that rule word for word, not a loose paraphrase.

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19.

"Since power is itself a value, forms of influence which include power in their scope are usually themselves forms of power. The king's mistress, though she has only influence, not power, over the king, may have power over his subjects in the degree of that influence. Forms of influence based on power are themselves forms of power only if the scope of the influence is included within that of the power in question. The king may exercise influence over standards of morality, say, by virtue of his power position, but he does not necessarily exercise power over morality."

Which of the following is similar to the ideas expressed in the paragraph?

(A) A king can influence what dramas are enacted by artists.

(B) A king can influence who acts in dramas in his kingdom.

(C) A king can indicate the appropriateness of dramas enacted.

(D) A king can influence the prices charged from drama groups by actors.

Correct Answer: (C) A king can indicate the appropriateness of dramas enacted.

SOLUTION:

The passage's central example is the king influencing standards of morality without holding actual power over morality. We need the option that follows the same shape: influence over a standard, not control over a concrete outcome.

1. **A king can influence what dramas are enacted**: choosing which play gets staged is a concrete decision, a direct exercise of control, not influence over a general standard.
2. **A king can influence who acts in dramas**: casting a specific actor is again a concrete, direct decision, not a standard-level influence.
3. **A king can indicate the appropriateness of dramas enacted**: appropriateness is a standard of judgement, just like morality. Shaping what counts as appropriate, without necessarily deciding which exact plays are staged, mirrors the king's influence over moral standards without power over morality itself.
4. **A king can influence the prices charged from drama groups**: pricing is a concrete commercial outcome, a direct exercise of control over a transaction, not influence over an abstract standard.

Only the appropriateness option matches the passage's pattern of influence over a standard rather than a concrete outcome, so the answer is that option.

Let's summarize:

- The passage's example is about influence over an abstract standard, not control over a specific, concrete decision.

- Casting, play selection and pricing are all concrete outcomes, while appropriateness is a standard, matching the morality example.

So the correct choice is option C, "A king can indicate the appropriateness of dramas enacted."

Quick Tip: Look for the option that describes influence over an abstract standard of judgement, like the passage's example of morality, rather than direct control over a concrete decision.

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20. As man casts off worn-out garments and puts on others which are new, similarly the embodied soul, casting off worn-out bodies, enters into others which are new. Of the following, which one best typifies the argument?

(A) Inductive generalization

(B) Predictive argument

(C) Argument from authority

(D) Argument from analogy

Correct Answer: (D) Argument from analogy

SOLUTION:

The sentence compares a person changing worn-out clothes for new ones with the soul changing worn-out bodies for new ones, joined by "as ... similarly".

1. **Inductive generalization**: this needs several observed cases pooled into one general rule. There is only a single comparison here, no pool of repeated instances, so this label does not fit.
2. **Predictive argument**: this forecasts a future outcome from a present trend. The sentence makes no forecast about what will happen next, it draws a comparison, so this does not fit either.
3. **Argument from authority**: this rests on citing an expert or trusted source. No such source is named here to back the claim, so this label is also out of place.
4. **Argument from analogy**: this uses one familiar case to support a claim about a different, less directly observable case, based on a shared pattern. Garments being discarded and replaced is the familiar case, the soul discarding bodies is the less familiar one, and the sentence explicitly links them with "as ... similarly". This is exactly what an analogy does.

The structure of the sentence is a textbook analogy, so the answer is "argument from analogy".

Let's summarize:

- Comparing words like "as" and "similarly" are a strong signal of an analogy at work.
- An analogy carries over a pattern from a familiar case to support a claim about a less familiar one.

So the correct choice is "argument from analogy".

Quick Tip: Spot the comparing words "as ... similarly", they signal that a pattern from one familiar case is being carried over to support a claim about a different case.

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21. All the parliamentarians whom the reporter interviewed told that they had voted as per their conscience. Therefore, probably all the parliamentarians voted as per their conscience. This argument is an example of:

(A) Inductive generalization

(B) Predictive argument

(C) Generalization based on authority

(D) Deduction generalization

Correct Answer: (A) Inductive generalization

SOLUTION:

Only the parliamentarians the reporter actually interviewed are the source of the claim, yet the conclusion reaches out to all parliamentarians, with the hedge word "probably" attached.

1. **Inductive generalization**: this is exactly a move from an observed sample to a probable claim about the wider group it was drawn from, which is what happens here: interviewed parliamentarians to all parliamentarians, with "probably" signalling the uncertainty that comes with generalizing from a sample.
2. **Predictive argument**: this would forecast something not yet known to have happened. The voting has already taken place, so there is nothing being predicted, only generalized.
3. **Generalization based on authority**: this would need an expert or trusted source being cited as proof. The parliamentarians are the people the claim is about, not authorities vouching for someone else's claim, so this label is wrong.
4. **Deduction generalization**: a real deduction needs a premise that already covers the entire group and delivers a certain conclusion. Here the premise covers only a sample, and the conclusion is hedged with "probably", the opposite of a deduction's certainty.

The sample-to-whole-group move with a probability hedge is the signature of inductive generalization, so that is the answer.

Let's summarize:

- Generalizing from an observed sample to the whole group, with a hedge like "probably", is inductive reasoning.
- A true deduction needs full coverage in its premise and gives a certain, not probable, conclusion.

So the correct choice is "inductive generalization".

Quick Tip: Notice the move from "the ones interviewed" (a sample) to "probably all" (the whole group), and the hedging word "probably" itself.

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22. Nature lovers are attracted to forests and nature parks. Just look at the number of people visiting the Corbett national park.
Which of the following exhibits a pattern of reasoning least dissimilar to (that is, closest to) the one shown in the argument above?

(A) Defence personnel who are trained in extremely rigorous procedures often end up as dysfunctional members of society. Hence if an officer is not trained rigorously, such an officer is more likely to be useful to society.

(B) This machinery has increased the work efficiency of the workers. As a result, some of these workers are surplus to the company.

(C) Fleas must thrive in a warm environment. During warm weather my dog suffers from fleas more than during cooler weather.

(D) Cigarette smoking is known to cause lung cancer in some people. However, most victims of lung cancer live in regions where smoking is uncommon.

Correct Answer: (C) Fleas must thrive in a warm environment. During warm weather my dog suffers from fleas more than during cooler weather.

SOLUTION:

Start by naming the pattern in the given argument: it is a "general claim plus one supporting example" argument. The claim is that nature lovers are drawn to parks, and the sole support offered is footfall data from one specific park, Corbett. No attempt is made to rule out other reasons people might visit (crowds, school trips, curiosity). We need the option built the same way.

1. **Option A**: Reasons backwards, from "training causes a bad outcome" to "no training must cause a good outcome." This is a converse error, a different mistake from the original.
2. **Option B**: A direct cause leading to a direct effect (better machines, fewer workers needed). No general claim is being tested with a single supporting example, so this does not match.
3. **Option C**: Here a general belief (fleas like warmth) is defended purely by one personal observation (the dog's flea count rises in warm weather), with no check for other explanations. This is exactly the "general claim, one anecdote as proof" shape used in the Corbett example.
4. **Option D**: Brings in a fact that works against the claim rather than for it, so it is not simply offering a supporting example; it is closer to a self-defeating argument.

Only option C keeps the same two-part structure, general claim first, then a single anecdotal case cited as evidence, so it is the closest match.

Let's summarize:

- Look for the same argument shape, not the same topic.
- The Corbett argument is "general rule plus one supporting anecdote."
- Option C (fleas and warm weather) copies this shape exactly.

The answer is option C.

Quick Tip: Match the reasoning pattern (general claim backed by one supporting anecdote), not the topic; look for the option that uses a single personal observation to confirm a general belief.

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23. In this era of global capital flows, so much money is now flowing through the world that no single country can fight inflation effectively by tightening its monetary policy.
If the above is true, which of the following could be most logically concluded?

(A) Changes in the cash reserve ratio by the Reserve Bank of India will control the rate of inflation in India.

(B) Countries' finance ministers have sufficient control over their respective economies.

(C) Countries' finance ministers have insufficient control over their respective economies.

(D) Inflation does not matter as long as incomes increase.

Correct Answer: (C) Countries' finance ministers have insufficient control over their respective economies.

SOLUTION:

Treat this as a strict "must follow" question: pick only the option that the given fact forces to be true, nothing extra. The fact given is that global money flows have grown so large that no country's monetary policy alone can beat inflation.

1. **Option A**: Claims a specific tool (CRR changes by RBI) will control inflation in India. This directly contradicts the passage, which says monetary policy tightening cannot do this effectively anymore.
2. **Option B**: Claims finance ministers still have enough grip on their economies. But losing the ability to control inflation through monetary policy is itself a loss of control, so this cannot be concluded.
3. **Option C**: If the main lever (monetary policy) cannot manage a key economic outcome (inflation), then economic control is incomplete. This is a safe, direct restatement of the passage's implication in different words.
4. **Option D**: Introduces a brand new idea (that rising incomes offset the importance of inflation), which the passage never mentions or implies.

Testing each option against the passage this way leaves only option C standing as a fair restatement of what must be true.

Let's summarize:

- A "most logically concluded" question needs an option that adds nothing beyond the given fact.
- Losing control over inflation through monetary policy means losing part of overall economic control, option C.
- Options A and B fight the premise, and option D is unrelated.

The answer is option C.

Quick Tip: A single-tool failure (monetary policy failing to beat inflation) is itself evidence of limited economic control; look for the option that states this directly.

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24. Many entrepreneurs try to control the composition of their boards of directors, but more experienced entrepreneurs tend to share control, inviting participation from institutional investors and outside directors. Which option best summarizes the idea that might be guiding experienced entrepreneurs' behaviour?

(A) The experienced entrepreneurs expect experienced directors to monitor the performance of the enterprise and be a sounding board.

(B) The experienced entrepreneurs expect the institutional investors to support the opinion of entrepreneurs on all major decisions.

(C) The experienced entrepreneurs expect the institutional investors and outside directors to agree to higher remuneration for the board members.

(D) Experienced entrepreneurs expect the experienced directors to engage in day-to-day management of the company.

Correct Answer: (A) The experienced entrepreneurs expect experienced directors to monitor the performance of the enterprise and be a sounding board.

SOLUTION:

Look at this from the entrepreneur's side: why would someone who has already built a company willingly hand over some control? The passage tells us they do, by bringing in institutional investors and outside directors, so the right answer must explain a real benefit of doing that.

1. **Option A**: Fits well. Bringing in experienced people to check on the business (monitoring) and to talk through decisions with (a sounding board) is a genuine reason to want outside directors on the board.
2. **Option B**: If investors are only there to agree with the entrepreneur, there is no real sharing of control, just a rubber stamp. This does not match the idea of inviting outside participation.
3. **Option C**: Asking board members to approve higher pay for themselves is a conflict of interest and unrelated to why boards are diversified.
4. **Option D**: Running daily operations is the job of company management, not the board; outside directors are not normally expected to do this.

The only option that gives a credible, board-appropriate reason for sharing control is option A: gaining performance monitoring and a sounding board for decisions.

Let's summarize:

- Experienced entrepreneurs add outside directors mainly for oversight and advice.
- Option A is the one option that describes this correctly.
- Options B, C, and D either contradict independent oversight or bring in unrelated motives.

The answer is option A.

Quick Tip: Ask why an experienced entrepreneur would willingly give up some control; look for the option describing a genuine governance benefit like oversight or advice.

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25. "There is nothing so stupid as an educated man, if you can get him off the thing he was educated in."
Which of the following, if true, most seriously undermines the author's contention?

(A) True education implies a well-rounded exposure to major subjects.

(B) An educated man will not discuss things which he does not understand.

(C) The cost of a general education has led to the unfortunate fact that a person's education is confined to one field.

(D) Stupidity, like intelligence, is relative and therefore depends on the intelligence of the person's peers.

Correct Answer: (A) True education implies a well-rounded exposure to major subjects.

SOLUTION:

First pin down what has to be true for the quote to hold: education must, in practice, be narrow enough that a person knows almost nothing outside it. Any option that shows education is not narrow will weaken the claim.

1. **Option A**: States that genuine education covers many major subjects, not just one. If that is how education actually works, an educated person would not turn "stupid" outside a narrow area, since there is no narrow area to begin with. This knocks out the author's core assumption.
2. **Option B**: Describes a discreet person, someone who avoids talking about what they do not know. This is about behaviour, not about whether the person actually knows things outside their field, so it leaves the author's point untouched.
3. **Option C**: Explains the narrowness with a cause (cost of general education), but this backs the author's claim rather than weakening it, since it agrees education has become confined to one field.
4. **Option D**: Talks about "stupid" being a relative term based on peers' intelligence. This shifts focus to definitions rather than disputing that education narrows people.

Since option A removes the very premise the quote depends on (that education is narrow), it is the strongest challenge to the author's contention.

Let's summarize:

- The quote depends on education being narrow in scope.
- Option A denies this by describing education as broad and well-rounded, which undermines the whole claim.
- Option C agrees with the author instead of opposing, and B and D miss the core assumption.

The answer is option A.

Quick Tip: Find the assumption behind the quote (education is narrow) and pick the option that denies it outright.

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26. Ram, an economist, and Ramesh, an astrologer, had a debate. Ram said, "Astrology does not work. It just cannot predict." "It can predict better than your subject," rebutted Ramesh.
The evidence that best resolves the above debate will be:

(A) Conduct a survey among scientists asking which one of the two should be considered a science.

(B) Compare the past performance of astrologers and economists in terms of the number of predictions which have come true.

(C) Conduct a survey among economists asking their opinion regarding the ability of economic theory to predict economic phenomena.

(D) Conduct an experiment where both astrologers and economists would be asked to predict the future. Compare the percentage of predictions that come true.

Correct Answer: (D) Conduct an experiment where both astrologers and economists would be asked to predict the future. Compare the percentage of predictions that come true.

SOLUTION:

Think of this as designing a fair experiment. Ram and Ramesh disagree about accuracy, so whatever evidence we collect must isolate accuracy and nothing else, like sample size differences or personal opinions.

1. **Option A**: A vote among scientists on which field deserves the label "science" is a question about status, not a measurement of predictive success. It settles nothing about accuracy.
2. **Option B**: Counting raw correct predictions rewards whichever group predicts more often, even if their hit rate is lower. This is a flawed comparison because it is not adjusted for how many attempts each side made.
3. **Option C**: This only surveys economists' self-opinion, ignoring astrologers entirely and relying on belief rather than actual outcomes.
4. **Option D (officially option E)**: Have both sides make predictions under the same conditions, then compare what percentage of each side's predictions actually came true. This controls for the number of attempts and gives a like-for-like accuracy comparison.

Because this option adjusts for sample size by using percentages instead of raw counts, it is the cleanest way to test who really predicts better.

Let's summarize:

- A fair accuracy test must control for how many predictions are made.
- Percentage correct does this; a raw count does not.
- Opinion surveys (A, C) do not measure actual predictive accuracy at all.

The answer is the percentage-comparison experiment.

Quick Tip: To compare predictive accuracy fairly between two groups, always compare a rate or percentage, not a raw count.

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27. Which of the following sentences draws a metaphor?

(A) Karl Marx argued that the interests of two classes, the proletariat and the bourgeois, are always in conflict and irreconcilable.

(B) Karl Marx labelled the capitalist a parasite on the back of labour because the whole value of the produce created by the labouring man was expropriated by the capitalist.

(C) Weber held that the protestant ethic was responsible for the rise of capitalism in medieval Europe.

(D) Galbraith argued for a better balance between private affluence and public poverty, including measures to protect the environment against the excesses of private companies.

Correct Answer: (B) Karl Marx labelled the capitalist a parasite on the back of labour because the whole value of the produce created by the labouring man was expropriated by the capitalist.

SOLUTION:

Scan each sentence for a word used outside its literal meaning to make an implicit comparison; that word signals a metaphor.

1. **Option A**: Every word here is used in its normal, literal sense (classes, conflict, interests); no figurative substitution happens.

2. **Option B**: The word "parasite" does not literally apply to a capitalist, a parasite is an organism, a capitalist is a person. Using "parasite" here transfers the idea of living off another's labour onto the capitalist, which is the textbook definition of a metaphor.
3. **Option C**: A straightforward statement of a historical theory, with no figurative language at all.
4. **Option D**: Uses ordinary policy language (affluence, poverty, environment) in its literal sense; there is no image being borrowed from one domain to describe another.

Only option B substitutes a literal word (parasite) from a different domain (biology) to describe a person (the capitalist), which is what makes it a metaphor.

Let's summarize:

- Look for a word borrowed from another domain and applied directly to something else.
- "Parasite" applied to the capitalist (option B) is this borrowing.
- The other sentences use only literal, direct language.

The answer is option B.

Quick Tip: Look for a word from one domain (like biology) applied directly to describe something else; that direct labeling is the metaphor.

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28. Which sentence includes an example of personification?

(A) Banjaras of Rajasthan are the human equivalent of an endangered species and have no defence against the encroachment of farmers onto their ancestral lands.

(B) Take airline pilots for example; they do not need to be graduates to qualify for this job and most pilots are on a salary of Rs. 300,000 per month or more.

(C) Recent research provided stark evidence that in education money still plays an important role; it was found that children from poor households could not perform as well as children from rich households.

(D) Girls in the family should have a share in the ancestral property as a matter of right whether the will includes it explicitly or not.

Correct Answer: (C) Recent research provided stark evidence that in education money still plays an important role; it was found that children from poor households could not perform as well as children from rich households.

SOLUTION:

Check each sentence for a verb that only a person can normally perform, then see if that verb's subject is something non-human. That combination signals personification.

1. **Option A**: Draws a comparison between a group of people and an endangered species; it does not give a non-human thing a human action, so it is an analogy rather than personification.
2. **Option B**: A factual, literal sentence about pilot qualifications and salary; every subject and verb is used in its ordinary sense.
3. **Option C**: The subject "research" is abstract and cannot literally act, yet the sentence has it "providing" evidence, a verb we would normally use for a person presenting findings. Giving this human action to an abstract subject is the mark of personification.
4. **Option D**: A direct statement of a right (inheritance); nothing is personified.

Since "research provided evidence" hands an abstract, non-human subject a distinctly human action, option C is the personification example.

Let's summarize:

- Personification needs a non-human subject paired with a human action.
- "Research provided...evidence" in option C fits this exactly.
- The remaining options stay literal or use comparison rather than personification.

The answer is option C.

Quick Tip: Look for a non-human or abstract subject paired with a verb that only a person would normally do; that pairing is personification.

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29. Which sentence suffers most from hyperbole?

(A) Most collectors of coins would give the Earth to own one of the copper coins issued by Mohammad Bin Tughlaq.

(B) It is thought that eating raw tomatoes would greatly reduce the risk of cancer, but tomato sauce can have a greater effect since it is made from many raw tomatoes.

(C) Cricket has a great following in India, but the twenty-twenty format took the game to nook and corner of the world.

(D) We face an imminent drinking water crisis in India as the population growth is accompanied by a general decrease in rainfall.

Correct Answer: (A) Most collectors of coins would give the Earth to own one of the copper coins issued by Mohammad Bin Tughlaq.

SOLUTION:

A quick way to spot hyperbole is to ask: if I take this sentence at face value, does it become absurd or physically impossible? A genuine hyperbole fails this literal test badly; an ordinary statement passes it easily.

1. **Option A**: Take "give the Earth" literally, no one can hand over a planet in exchange for a coin. The sentence fails the literal test completely, which is exactly what marks strong hyperbole.
2. **Option B**: Taken literally, this is just a claim about tomatoes and cancer risk. It might be true or false, but it does not become absurd when read literally, so it is not hyperbole.
3. **Option C**: "Nook and corner of the world" read literally would mean every single corner, which is not literally true, but the sentence is describing a real, large-scale spread of a sport. The exaggeration here is mild and idiomatic, not the extreme, impossible kind seen in Option A.
4. **Option D**: Read literally, this sentence states a real demographic and climate trend. It holds up fine under a literal reading.

Ranking the four by how badly they fail the literal test, Option A fails it hardest since giving away the Earth is not just unlikely but flatly impossible. That makes it the sentence that suffers most from hyperbole.

Let's summarize:

- The literal test: if a sentence turns absurd or impossible when read at face value, it is hyperbole.
- Option A fails this test completely; the rest read as normal or mildly idiomatic statements.

So the answer is Option A.

Quick Tip: Hyperbole means an exaggeration so extreme it becomes literally impossible. Look for the sentence with an over the top, unbelievable claim.

• • •

30. Which sentence includes a euphemism?

(A) Cell phone network signals are weak in the hilly regions.

(B) Bottled water is reputed to be safe for drinking under all circumstances.

(C) A cemetery is a place where people are buried when they pass away.

(D) It is stupid to cry over split milk.

Correct Answer: (C) A cemetery is a place where people are buried when they pass away.

SOLUTION:

To test for a euphemism, swap the suspected soft phrase back for its blunt, everyday equivalent. If the sentence still makes complete sense and only sounds harsher, the phrase was a euphemism.

1. **Option A**: Swapping "weak" for any blunter word does not change much; "weak" is already the plain, direct word here. No euphemism present.
2. **Option B**: There is no soft phrase to swap out in this sentence about bottled water; it is stated directly.
3. **Option C**: Swap "pass away" for "die": "A cemetery is a place where people are buried when they die." The sentence still works, and the direct version simply sounds blunter. That confirms "pass away" is a euphemism for "die."
4. **Option D**: "Cry over split milk" cannot be swapped for a single blunt word because it is a fixed idiom describing pointless regret, not a soft stand-in for one harsh term.

Only Option C passes the swap test, so it is the sentence built around a euphemism.

Let's summarize:

- Swap test: replace the soft phrase with its blunt equivalent; if the sentence still holds together, it was a euphemism.
- Option C passes this test with "pass away" standing in for "die"; the other options have no such substitution to make.

So the answer is Option C.

Quick Tip: A euphemism is a soft, indirect word standing in for a blunt one. Look for the option that avoids saying "die" directly.

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31. Which of the following contains a non-sequitur?

(A) If statisticians are made judges, they will accept or reject arguments based on probability analyses.

(B) Public trust in politicians is at an all time low and we can't insist that the politicians go back to school.

(C) Before preparing the annual budget, the CEO of XYZ Steel Limited takes opinion of all the stakeholders.

(D) In cricket, the batting average does not always reflect a batsman's ability because it does not reflect how many wins he was instrumental for.

Correct Answer: (B) Public trust in politicians is at an all time low and we can't insist that the politicians go back to school.

SOLUTION:

Check each sentence by asking: does the second half give a reason that could actually lead to the first half's claim, or could the two halves stand as two separate facts stitched together for no real reason?

1. **Option A**: "statisticians as judges" leading to "judging by probability" is a direct, expected consequence. The link holds.
2. **Option B**: Ask why low public trust in politicians would mean "we can't insist politicians go back to school." There is no cause and effect or supporting relation between distrust and schooling. The sentence only pretends to connect two ideas with "and," when in fact one has nothing to do with the other.
3. **Option C**: Taking stakeholder opinion before a budget is a standard, expected step in planning; the link between "before budgeting" and "takes opinion" is sound.
4. **Option D**: The claim "average does not reflect ability" is backed by a specific reason, that it ignores match-winning contributions. Even if one disagrees with the reasoning, it is at least a real attempt at logical support.

Only Option B fails this check outright, joining two unrelated ideas as if they were connected, which is the definition of a non-sequitur.

Let's summarize:

- Test: can the second half be explained as a genuine consequence of the first half?
- Options A, C, and D pass; Option B fails since trust in politicians and going back to school share no logical link.

So the answer is Option B.

Quick Tip: A non-sequitur has a conclusion that does not logically follow its premise. Find the option where the two halves have no real connection.

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32. Recommence is to suspend as nonchalant is to:

(A) carefree

(B) beleaguered

(C) tirade

(D) agreement

Correct Answer: (B) beleaguered

SOLUTION:

This is a word relationship question. Before touching the options, name the relationship in the given pair in plain words: "recommence" (begin again) and "suspend" (pause or stop) describe opposite actions, one restart, one halt. So the blank must also be filled by the opposite of "nonchalant."

"Nonchalant" means unconcerned, calm, and not showing worry. Its opposite is a word describing someone weighed down by trouble or anxiety.

1. **carefree**: means the same as nonchalant, not the opposite, so it cannot fit an antonym pair.
2. **beleaguered**: means under siege, harassed by problems or pressure, which is a direct opposite of being calm and unconcerned.
3. **tirade**: a long, angry outburst of criticism; it names a type of speech, not an emotional state, so it does not pair with an adjective like nonchalant.
4. **agreement**: describes consensus between people, with no connection to calmness or worry.

Only "beleaguered" gives a true antonym of "nonchalant," matching the antonym relationship of "recommence" and "suspend."

Let's summarize:

- Name the relationship first: recommence and suspend are opposites.
- Then look for the true opposite of nonchalant: beleaguered, not a synonym like carefree.

So the answer is Option B, beleaguered.

Quick Tip: First name the relationship in the given pair (recommence/suspend are opposites), then look for the true opposite of nonchalant.

• • •

33. Which sentence includes an oxymoron?

(A) On weekend we ate and drank a lot.

(B) Meena corrected me by pointing out that she wanted pizza instead of burger.

(C) Media reported the attack on media-persons.

(D) He loved his aunt but found her kindness suffocating.

Correct Answer: (D) He loved his aunt but found her kindness suffocating.

SOLUTION:

Look for a two or three word phrase where the words pull in opposite emotional directions at the same time; that clash inside one phrase is the mark of an oxymoron.

1. **Option A**: no clashing phrase; eating and drinking on a weekend are ordinary, compatible activities.
2. **Option B**: no clashing phrase; choosing pizza over burger is a simple preference.
3. **Option C**: repeats the word "media" in two roles, the reporter and the target, which reads as ironic, but the words "attack" and "media-persons" do not contradict each other in meaning.
4. **Option D**: the phrase "her kindness suffocating" fuses "kindness," a warm and positive quality, with "suffocating," a smothering and negative feeling, inside a single short phrase. That direct clash of opposite meanings in one phrase is the oxymoron.

Only Option D has this built-in contradiction, so it is the sentence with the oxymoron.

Let's summarize:

- Test: find a short phrase where the two words directly contradict each other in feeling or meaning.
- "Kindness suffocating" in Option D passes this test; the other options do not contain such a phrase.

So the answer is Option D.

Quick Tip: An oxymoron fuses two opposite-meaning words into one short phrase. Look for the option where a positive and negative word are pushed together.

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34. From questions 34 to 35, read the sentences and choose the option that best arranges them in a logical order.
Arrange the following sentences in the correct logical order:
1. The moral will arises when, for the reasons we saw earlier, this negation has to be negated; the individual moral will understands that it is the existence of the universal will, which is therefore internal to it.
2. This constitutes a negation, because the individual will is understood not to be the existence of the universal will.
3. This says that in abstract right, as we have just seen, the individual will takes its freedom (the universal will that has being in itself) to exist independent of (that is, in opposition to) itself and its particular contents.
4. Rather, the universal will is thought to exist outside any individual will, in the contracts that bind a number of property owning wills together, and in the punishments that enforce breaches of those contracts.

(A) 1, 2, 3, 4

(B) 3, 2, 4, 1

(C) 3, 1, 2, 4

(D) 1, 2, 3, 4

Correct Answer: (B) 3, 2, 4, 1

SOLUTION:

With a dense passage like this, the fastest method is to trace every pronoun and connector ("this," "rather") back to the one sentence it can attach to, rather than trying to fully unpack the philosophical content in one go.

1. **Sentence 3**: introduces "abstract right" and explains that the individual will treats its freedom as standing apart from, and opposed to, itself and its own content. It uses no backward pointing word, so it is the only sentence that can open the passage.
2. **Sentence 2**: opens with "This constitutes a negation." The word "this" needs an antecedent, and the only sentence that describes a state which can be called a "negation" is sentence 3, where the will is set up as being in opposition to itself. So sentence 2 must sit right after sentence 3.
3. **Sentence 4**: opens with "Rather," a word that corrects or redirects a claim just made. It redirects the idea in sentence 2, that the individual will is not the universal will's existence, by saying where the universal will's existence is actually found instead: in contracts and punishments. So sentence 4 must follow sentence 2.
4. **Sentence 1**: describes the "moral will" arising once "this negation" is itself negated. The negation being negated is the very state built up across sentences 3, 2, and 4, so sentence 1 must come last, as the resolution of that chain.

Chaining the connectors gives 3 (starts the idea), 2 (names it a negation), 4 (redirects to where the universal will really exists), 1 (resolves the negation into the moral will).

Let's summarize:

- Sentences with no backward pointer, like sentence 3, must open the passage.
- Words like "this" and "rather" always point to the immediately preceding idea, and tracing them gives the order 3, 2, 4, 1.

So the correct order is 3, 2, 4, 1.

Quick Tip: Find the sentence with no backward-pointing word to open the passage, then trace "this" and "rather" to the sentence each one is reacting to.

• • •

35. Arrange the following sentences in the correct logical order:
1. In the concept, universality, particularity, and individuality are understood as being immediately identical to each other.
2. As immediately identical, these "moments of the concept" cannot be separated.
3. This means that they must be thought of as a single unity, that none of the three can be understood apart from the others, since in the concept their identity is posited, and each of its moments can only be grasped immediately on the basis of and together with the others.
4. The interrelation of universality, particularity, and individuality is otherwise in judgment.

(A) 1, 2, 3, 4

(B) 3, 2, 4, 1

(C) 4, 1, 2, 3

(D) 2, 3, 1, 4

Correct Answer: (A) 1, 2, 3, 4

SOLUTION:

The cleanest way through this kind of passage is to find which sentence names the subject for the first time, then follow each connector word to the sentence it must be reacting to.

1. **Sentence 1**: names "universality, particularity, and individuality" and makes the first claim about them, that they are "immediately identical" in the concept. No pronoun points backward, so this line has to come first.
2. **Sentence 2**: reuses the exact phrase "immediately identical" from sentence 1 and calls the three terms "these moments of the concept," a label that only makes sense once sentence 1 has introduced them. Sentence 2 draws a consequence, they cannot be separated, from sentence 1's claim, so it follows directly after it.
3. **Sentence 3**: starts with "This means," which needs an immediately preceding claim to unpack. That claim is sentence 2's "cannot be separated," which sentence 3 restates more fully as "must be thought of as a single unity." So sentence 3 follows sentence 2.
4. **Sentence 4**: uses "otherwise," a word that sets up a contrast with a case already described. Since sentences 1 to 3 describe how the three terms behave "in the concept," sentence 4 can only make sense as the final line, contrasting that with how they behave "in judgment."

Following the chain of connectors gives the order 1 (introduces the claim), 2 (draws out "cannot be separated"), 3 (explains this as a single unity), 4 (contrasts with judgment).

Let's summarize:

- The sentence introducing a term with no backward pointer must open the passage.
- Repeated key phrases ("immediately identical," "this means," "otherwise") tie each sentence to the one right before it, giving the order 1, 2, 3, 4.

So the correct order is 1, 2, 3, 4.

Quick Tip: Find the sentence that introduces the three terms with no backward-pointing word, then trace "these," "this means," and "otherwise" to their antecedents.

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36. In an examination there are 30 questions. 1 mark is given for each correct answer and 0.25 is deducted for every incorrect answer. Ankur attempted all the questions and scored 13.75. How many incorrect answers did he have?

(A) 10

(B) 11

(C) 12

(D) None of the above.

Correct Answer: (D) None of the above.

SOLUTION:

Step 1: Start from a perfect score.
If Ankur had answered all 30 questions correctly, his score would be 30, since each correct answer earns 1 mark and there is no penalty for a right answer.

Step 2: Find how many marks he actually lost.
His real score is 13.75, so compared to a perfect score he lost
$30 - 13.75 = 16.25$ marks.

Step 3: Work out what one wrong answer costs him.
Swapping one correct answer for one wrong answer does two things at once: it removes the 1 mark he would have earned, and it adds a 0.25 mark penalty.
So each wrong answer costs him $1 + 0.25 = 1.25$ marks compared to the perfect score.

Step 4: Divide the total loss by the cost per wrong answer.
Number of wrong answers $= \frac{16.25}{1.25} = 13$.

Step 5: Match with the given choices.
13 is not among 10, 11, 12 or 15, so none of the listed numbers work.

Final Answer:
Ankur had 13 incorrect answers, so the correct choice is option E, none of the above.

13

Quick Tip: Set up c + w = 30 and c - 0.25w = 13.75, then solve the pair of equations for w.

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37. A salesman sells two kinds of trousers: cotton and woollen. A pair of cotton trousers is sold at 30% profit and a pair of woollen trousers is sold at 50% profit. The salesman had calculated that if he sells 100% more woollen trousers than cotton trousers, his overall profit would be 45%. However, he ends up selling 50% more cotton trousers than woollen trousers. What will be his overall profit?

(A) 37.5%

(B) 40%

(C) 41%

(D) 42.33%

Correct Answer: (B) 40%

SOLUTION:

Step 1: Set up profit as a weighted average.
Overall profit percentage is a weighted average of the two profit rates, where the weight of each type is its share of total cost, not its share of quantity. Let the cost of a cotton trouser be x and a woollen trouser be y.

Step 2: Use the planned scenario to connect x and y.
Planned woollen quantity is double the cotton quantity. If cotton quantity is a, woollen quantity is $2a$.

$$\frac{0.30(ax) + 0.50(2ay)}{ax + 2ay} = 0.45$$

Cancel a and simplify:

$$0.30x + 1.00y = 0.45x + 0.90y$$

$$0.10y = 0.15x \implies y = 1.5x$$

A woollen trouser's cost price is 1.5 times a cotton trouser's cost price.

Step 3: Apply this ratio to the actual sales.
Actual cotton quantity is 50% more than woollen quantity, so if woollen quantity is b, cotton quantity is $1.5b$. With $y = 1.5x$:

$$\frac{0.30(1.5b \cdot x) + 0.50(b \cdot 1.5x)}{1.5b \cdot x + b \cdot 1.5x}$$

Step 4: Simplify the fraction.
Numerator: $0.45bx + 0.75bx = 1.20bx$. Denominator: $1.5bx + 1.5bx = 3.0bx$.

$$\text{Overall profit} = \frac{1.20bx}{3.0bx} = 0.40 = 40\%$$

Final Answer:
The actual overall profit is 40%, so the correct choice is B.

$$\boxed{40\%}$$

Quick Tip: Overall profit is a cost-weighted average; first find the cost ratio of woollen to cotton trousers from the planned 45% profit, then reapply it with the actual quantity ratio.

• • •

38. Each of the following questions is followed by two statements, I and II. Decide whether the data given in the statements is sufficient to answer the question.

For each rupee in monthly advertising expenditure, KUMAR & Co. experiences a Rs. 6 increase in sales. How much does KUMAR & Co. have to spend on advertising to attain Rs. 1,000,000 in sales revenue for the month?

I. Without advertising, KUMAR & Co. earns Rs. 200,000 sales revenue per month.
II. When KUMAR & Co. spends Rs. 15,000 on advertising, it earns Rs. 290,000 as sales revenue.

(A) If Statement I alone is sufficient to answer the question.

(B) If Statement II alone is sufficient to answer the question.

(C) If Statement I and Statement II together are sufficient, but neither statement alone is sufficient to answer the question.

(D) If either Statement I alone or Statement II alone is sufficient to answer the question.

Correct Answer: (D) If either Statement I alone or Statement II alone is sufficient to answer the question.

SOLUTION:

Step 1: Recognize this as a straight line with known slope.
Treat sales S as a linear function of advertising spend A: $S = S_0 + 6A$, where the slope 6 comes straight from the question. Only the intercept S_0, sales with no advertising, is missing.

Step 2: Check what Statement I hands us.
Statement I directly states $S_0 = 200{,}000$. With the slope already known, this fixes the line, so we can solve for A when $S = 1{,}000{,}000$:

$$A = \frac{1{,}000{,}000 - 200{,}000}{6} = \frac{800{,}000}{6} \approx 133{,}333$$

Statement I alone answers the question.

Step 3: Check what Statement II hands us.
Statement II gives one point on the same line: $(A, S) = (15{,}000, 290{,}000)$. Since the slope is fixed at 6 by the question, one point is enough to find the intercept:

$$S_0 = 290{,}000 - 6(15{,}000) = 200{,}000$$

This is the same line as before, so Statement II alone also lets us compute A, giving the same value, about 133,333.

Step 4: Decide the sufficiency category.
Both statements, independently, fully determine the same equation. There is no need to combine them, and this is not a sufficient-together-only case.

Final Answer:
Either statement by itself is sufficient to answer the question, so the answer is D.

$$\boxed{D}$$

Quick Tip: The slope of the sales-advertising line is already given in the question; each statement supplies just enough extra data to fix the line completely.

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39. Each of the following questions is followed by two statements, I and II. Decide whether the data given in the statements is sufficient to answer the question.

Geetanjali Express, which is 250 metres long, crosses the Subarnarekha bridge in 30 seconds while moving from Howrah to Tatanagar. What is the speed of Geetanjali Express?

I. Bombay Mail, which runs at 60 km/hour, crosses the Subarnarekha bridge in 30 seconds.
II. Bombay Mail, running at 90 km/hour, crosses a lamp post in 10 seconds.

(A) If Statement I alone is sufficient to answer the question.

(B) If Statement II alone is sufficient to answer the question.

(C) If Statement I and Statement II together are sufficient, but neither statement alone is sufficient to answer the question.

(D) If either Statement I alone or Statement II alone is sufficient to answer the question.

Correct Answer: (C) If Statement I and Statement II together are sufficient, but neither statement alone is sufficient to answer the question.

SOLUTION:

Step 1: List the unknowns.
There are three unknowns: the bridge's length, Bombay Mail's length, and Geetanjali's speed. Geetanjali's own length (250 m) and crossing time (30 s) are given, but the bridge length is missing, so its speed cannot be pinned down yet.

Step 2: Check Statement II by itself.

A lamp post has no length, so distance covered equals the train's own length. At 90 km/hr = 25 m/s for 10 s, Bombay Mail's length is $25 \times 10 = 250$ m. This finds Bombay Mail's length only and says nothing about the bridge or Geetanjali. Not sufficient alone.

Step 3: Check Statement I by itself.
Statement I says Bombay Mail at 60 km/hr crosses the bridge in 30 s. This single equation mixes two unknowns, Bombay Mail's length and the bridge's length, so it cannot be solved alone. Not sufficient alone.

Step 4: Combine the two statements.
Statement II gives Bombay Mail's length as 250 m. Feed this into Statement I: 60 km/hr $= \frac{50}{3}$ m/s, and in 30 s Bombay Mail covers $\frac{50}{3} \times 30 = 500$ m. This distance is Bombay Mail's length plus the bridge length, so the bridge is $500 - 250 = 250$ m long.

Step 5: Now solve for Geetanjali's speed.
Geetanjali covers $250 + 250 = 500$ m in 30 s, giving a speed of $\frac{500}{30} = \frac{50}{3}$ m/s, which is 60 km/hr.

Final Answer:
The bridge length, and hence Geetanjali's speed, can only be found using both statements together, so the answer is C.

$\boxed{C}$

Quick Tip: Use the lamp post statement to find Bombay Mail's own length, then use the bridge-crossing statement to find the bridge length; only then can Geetanjali's speed be found.

• • •

40. Rajesh walks to and from a shopping mall. He spends 30 minutes shopping there. If he walks at a speed of 10 km/hour, he returns home at 19.00 hours. If he walks at 15 km/hour, he returns home at 18.30 hours. How fast must he walk in order to return home at 18.15 hours?

(A) 17 km/hour
(B) 17.5 km/hour
(C) 18 km/hour
(D) None of the above.

Correct Answer: (D) None of the above.

SOLUTION:

Step 1: Notice that shopping time is constant and drops out.
Since he always shops for 30 minutes, only the walking time changes between scenarios. Compare walking times directly instead of full time-away-from-home totals.

Step 2: Express round-trip walking time as $\frac{2d}{v}$.
At 10 km/hr, walking time is $\frac{2d}{10}$ hours. At 15 km/hr, it is $\frac{2d}{15}$ hours. The 30 minute gap between the two return times (19:00 versus 18:30) is entirely due to the change in walking time.

$$\frac{2d}{10} - \frac{2d}{15} = \frac{1}{2}$$

Multiply through by 30:

$$6d - 4d = 15 \implies 2d = 15 \implies d = 7.5 \text{ km}$$

Step 3: Anchor the timeline using one full scenario.
At 15 km/hr: walking time $= \frac{2(7.5)}{15} = 1$ hour, plus 0.5 hour shopping $= 1.5$ hours total, arriving back at 18:30. So he left home at 18:30 minus 1.5 hours $=$ **17:00**.

Step 4: Work out the time budget for the new target.
To be back by 18:15, the total time away from 17:00 must be 1 hour 15 minutes. Removing the fixed 30 minutes of shopping leaves 45 minutes, or 0.75 hour, for walking both ways.

Step 5: Convert the walking time into a speed.
Round trip distance is $2 \times 7.5 = 15$ km, walked in 0.75 hour, so

$$v = \frac{15 \text{ km}}{0.75 \text{ hr}} = 20 \text{ km/hour}$$

Final Answer:
20 km/hour is not one of 17, 17.5 or 18 km/hour, so the answer must be option E, none of the above.

$$\boxed{20 \text{ km/hour}}$$

Quick Tip: The 30-minute shopping stop is constant, so compare only the walking times to find the one-way distance, then find Rajesh's fixed leaving time before solving for the new speed.

• • •

41. A shop sells two kinds of rolls: egg roll and mutton roll. Onion, tomato, carrot, chilli sauce and tomato sauce are the additional ingredients. A customer can have any combination of additional ingredients, or a standard roll with no additional ingredients, subject to the following constraints:

(a) Tomato sauce can be added if the roll has egg, but not if it is a mutton roll.
(b) Chilli sauce can be added only if the roll has onion or tomato or both; otherwise it cannot be added.

How many different rolls can be ordered according to these rules?

(A) 21
(B) 33
(C) 40
(D) 42

Correct Answer: (D) 42

SOLUTION:

Step 1: Start from the unrestricted count and subtract the invalid cases.
Ignoring both rules for a moment, each of the 5 add-ons, onion, tomato, carrot, chilli sauce and tomato sauce, is independently present or absent, giving $2^5 = 32$ combinations for each roll type.

Step 2: Remove the mutton roll cases that break rule (a).
Rule (a) says tomato sauce is not allowed on a mutton roll. Among the 32 mutton-roll combinations, exactly half have tomato sauce present, since it is one independent yes or no bit: $32/2 = 16$ invalid mutton combinations. Valid mutton combinations so far: $32 - 16 = 16$.

Step 3: Remove the cases that break rule (b), separately for each roll type.
Rule (b) forbids chilli sauce when both onion and tomato are absent. For the egg roll, fixing onion = no, tomato = no, chilli sauce = yes leaves carrot and tomato sauce free, giving $2 \times 2 = 4$ invalid combinations. Valid egg combinations: $32 - 4 = 28$.
For the mutton roll, tomato sauce is already fixed at no from Step 2, so within those 16 combinations, the invalid rule (b) cases have onion = no, tomato = no, chilli sauce = yes, tomato sauce = no, with carrot free: 2 invalid combinations. Valid mutton combinations: $16 - 2 = 14$.

Step 4: Add the two valid counts.
Total valid rolls $= 28 + 14 = 42$.

Final Answer:
This subtraction approach also gives 42, confirming option D.

$$\boxed{42}$$

Quick Tip: Split the count by roll type since tomato sauce depends on it, and handle chilli sauce separately since it depends only on onion and tomato being present.

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42. Given five points A = (7, 4), B = (-10, 0), C = (-10, 3), D = (0, 10) and E = (7, 7). Every second, all the points move by halving their abscissas (x-coordinates) and doubling their ordinates (y-coordinates). This process continues for 500 years. After 500 years, which two points are closest?

(A) A and B

(B) B and C

(C) A and E

(D) A and C

Correct Answer: (D) A and C

SOLUTION:

Step 1: Write the distance formula between two moving points after n seconds.
For two points with starting coordinates (x_1, y_1) and (x_2, y_2), after n steps their positions are $\left(\frac{x_1}{2^n}, y_1 2^n\right)$ and $\left(\frac{x_2}{2^n}, y_2 2^n\right)$. The squared distance between them is

$$D_n^2 = \left(\frac{x_1 - x_2}{2^n}\right)^2 + ((y_1 - y_2)2^n)^2$$

Step 2: Factor out the dominant term for large n.
As n grows, $\left(\frac{x_1 - x_2}{2^n}\right)^2 \to 0$, while $((y_1 - y_2)2^n)^2$ grows fast unless $y_1 = y_2$. So for a large n like 500,

$$D_n \approx |y_1 - y_2| \cdot 2^n$$

This means the x-coordinates stop mattering almost completely once n is large, and only the original difference in y-values decides how far apart two points end up.

Step 3: Since 2^n is the same multiplier for every pair, only $|y_1 - y_2|$ decides the ranking.
Between two different pairs of points, the one with the smaller starting $|y_1 - y_2|$ will always have the smaller distance for large n, since both distances get multiplied by the identical factor 2^n.

Step 4: List the y-values and compute all relevant gaps.
A = 4, B = 0, C = 3, D = 10, E = 7. Checking the answer choices: A,B gives 4; B,C gives 3; A,E gives 3; A,C gives 1. Checking the rest for completeness: A,D gives 6; B,D gives 10; B,E gives 7; C,D gives 7; C,E gives 4; D,E gives 3.

Step 5: The smallest gap wins.
The smallest of all these gaps is 1, between A and C. No other pair starts anywhere near this close in y-value.

Final Answer:
As time goes on, A and C become the closest pair of points, since their y-coordinates started nearest to each other and the x-coordinates become irrelevant.

$$\boxed{\text{A and C}}$$

Quick Tip: After many steps the x-coordinates shrink to near zero while the y-coordinates blow up, so the closest pair is simply the one whose starting y-values are nearest to each other.

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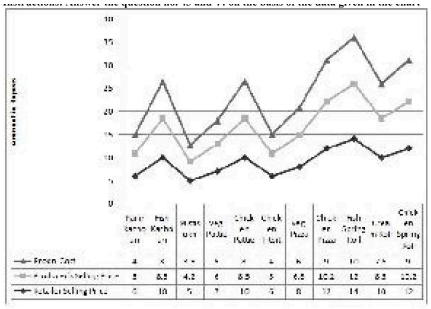
43. The chart below gives the per unit selling prices and costs, in rupees, of 11 items prepared by a sweetshop. Producer's margin is the gap between the cost and the producer's selling price. Retailer's margin is the gap between the producer's selling price and the retailer's selling price.



Based on the chart, which of the following conclusions can be made?

(A) Producer's margin for panir kachouri is less than the retailer's margin.

(B) Producer's margin for chicken pizza is more than the retailer's margin.

(C) Producer's margin for fish spring roll is more than the retailer's margin.

(D) Producer's and retailer's margins are highest for panir kachouri alone.

Correct Answer: (C) Producer's margin for fish spring roll is more than the retailer's margin.

SOLUTION:

This is a chart reading question with three price series for 11 sweetshop products: cost, producer's selling price and retailer's selling price. Instead of comparing raw gaps, think of it as: which of these two, the producer or the retailer, adds more value in rupee terms to each product?

1. **Panir kachouri, producer's margin less than retailer's**: Checking the chart, the steepest rise for panir kachouri happens between the cost line and the producer's price line, so the producer adds more here. The claim that the producer's margin is smaller is false.
2. **Chicken pizza, producer's margin more than retailer's**: For chicken pizza the retailer's price line pulls far above the producer's price line while the producer's price stays close to cost, so the retailer, not the producer, earns the bigger cut. This claim is false.
3. **Fish spring roll, producer's margin more than retailer's**: For fish spring roll the cost line and the producer's price line are far apart, and the producer's price line and retailer's price line sit close together on top. That means the producer captures most of the markup on this item, so this claim checks out.
4. **Panir kachouri margins highest overall**: Scanning across all 11 items, later items such as fish spring roll and chicken spring roll show gaps at least as large as panir kachouri, so panir kachouri is not the single highest case.

Let's summarize:

- A three line chart like this hides two separate margins: cost to producer, and producer to retailer.
- Always compare the two gaps item by item rather than judging from overall height.

The chart supports only the statement about fish spring roll, so option (C) is correct.

Quick Tip: Compare the two vertical gaps, cost to producer's price, and producer's price to retailer's price, item by item rather than looking at overall height.

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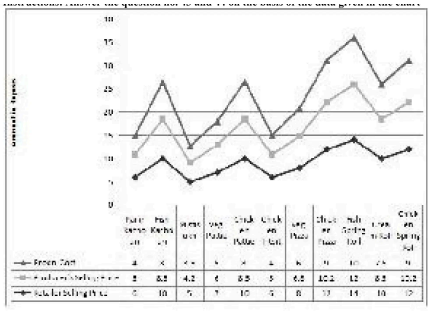
44. The chart above, used for the previous question, plots the cost, producer's selling price and retailer's selling price, in rupees, for 11 items prepared by a sweetshop.



Which of the following conclusion can be drawn from the diagram?

(A) Retailer's selling price for mistisukh was more than producer's selling price for chicken titbit.

(B) Difference between retailer's selling price and producer's selling price for fish kachouri was more than that of cream roll.

(C) These are three types of margins for all items.

(D) The three lines that connect different points, in the diagram above, are superfluous.

Correct Answer: (D) The three lines that connect different points, in the diagram above, are superfluous.

SOLUTION:

Before picking an option, ask what kind of chart this actually is. It shows three price series for 11 separate sweetshop products. A line chart is normally meant for a continuous variable such as time, where joining consecutive points shows a trend.

1. **Mistisukh vs chicken titbit**: This option is really asking us to compare a point on one line for one product against a point on a different line for a totally different product. Nothing in the chart's design supports that kind of cross category, cross series comparison with confidence.
2. **Fish kachouri gap vs cream roll gap**: This too needs a precise reading of two small gaps at two separate products, which is well beyond what a chart drawn this way can reliably confirm.
3. **Three margins for all items**: Look again at what is actually plotted, it is cost, producer's price and retailer's price, three prices, not three margins. A margin is a difference between two prices, so at most two margins, producer's and retailer's, exist here. This statement mislabels the chart.
4. **Connecting lines are superfluous**: The 11 products on the x-axis have no natural order or continuous relationship to each other, panir kachouri is not next to chicken pizza in any numeric sense. So joining them with a line, as if reading left to right shows a trend, adds a false sense of continuity. The lines do not carry any extra information beyond the individual points.

Let's summarize:

- A chart across unrelated categories should really be a set of separate markers, not a connected line.
- Recognising when a chart type is being misused is itself a valid, safe conclusion to draw.

So the correct conclusion is option (E), the connecting lines are superfluous.

Quick Tip: Check whether the x-axis is a real continuous scale before trusting the lines joining the points, and count how many genuine margins three price lines can actually give.

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45. Mungeri Lal has two investment plans, A and B, to choose from. Plan A offers interest of 10% compounded annually, while plan B offers simple interest of 12% per annum. Till how many years is plan B a better investment?

(A) 3

(B) 4

(C) 5

(D) 6

Correct Answer: (B) 4

SOLUTION:

Step 1: Set up the difference.
Let $D(n) = (1 + 0.12n) - (1.10)^n$, the extra amount Plan B gives over Plan A after n years. Plan B is the better choice as long as $D(n) > 0$.

Step 2: Track $D(n)$ year by year.
$n = 1$: $D = 1.12 - 1.10 = 0.02 > 0$.
$n = 2$: $D = 1.24 - 1.21 = 0.03 > 0$.
$n = 3$: $D = 1.36 - 1.331 = 0.029 > 0$.
$n = 4$: $D = 1.48 - 1.4641 = 0.0159 > 0$, still positive but shrinking fast.
$n = 5$: $D = 1.60 - 1.61051 = -0.01051 < 0$, Plan B has now fallen behind.

Step 3: Read off the crossover.
$D(n)$ stays positive through $n = 4$ and turns negative at $n = 5$. Compound growth is slow at first but eventually beats a fixed 12% add on every year, because compounding acts on an ever growing base while simple interest always adds the same fixed 12% of the original Re. 1.

Step 4: Final answer.
Plan B stays ahead for 4 full years before Plan A's compounding catches up.

$\boxed{4}$

Quick Tip: Compare $(1.10)^n$ with $1 + 0.12n$ year by year until the compound value overtakes the simple value.

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46. For all real numbers x, except $x = 0$ and $x = 1$, the function F is defined by

$$F\left(\frac{x}{x-1}\right) = \frac{1}{x}.$$

If $0 < \alpha < 90°$, then $F((\operatorname{cosec}\alpha)^2) =$

(A) $(\sin\alpha)^2$

(B) $(\cos\alpha)^2$

(C) $(\tan\alpha)^2$

(D) $(\cot\alpha)^2$

Correct Answer: (B) $(\cos\alpha)^2$

SOLUTION:

Step 1: Match the input directly.

We need $F((\operatorname{cosec}\alpha)^2)$. Instead of finding a general formula for F, look for the value of x that makes $\frac{x}{x-1}$ equal to $(\operatorname{cosec}\alpha)^2$ itself, since we already know $F\left(\frac{x}{x-1}\right) = \frac{1}{x}$ for that same x.

Step 2: Set up the equation.

$$\frac{x}{x-1} = \operatorname{cosec}^2\alpha$$

Cross multiply: $x = \operatorname{cosec}^2\alpha\,(x-1)$, so $x = x\operatorname{cosec}^2\alpha - \operatorname{cosec}^2\alpha$.

Step 3: Solve for x.

$$\operatorname{cosec}^2\alpha = x(\operatorname{cosec}^2\alpha - 1) \implies x = \frac{\operatorname{cosec}^2\alpha}{\operatorname{cosec}^2\alpha - 1}$$

Using the identity $\operatorname{cosec}^2\alpha - 1 = \cot^2\alpha$, this becomes

$$x = \frac{\operatorname{cosec}^2\alpha}{\cot^2\alpha}$$

Step 4: Simplify x using sine and cosine.

$\operatorname{cosec}^2\alpha = \frac{1}{\sin^2\alpha}$ and $\cot^2\alpha = \frac{\cos^2\alpha}{\sin^2\alpha}$, so

$$x = \frac{1/\sin^2\alpha}{\cos^2\alpha/\sin^2\alpha} = \frac{1}{\cos^2\alpha} = \sec^2\alpha$$

Step 5: Get F as 1/x.

Since $F\left(\frac{x}{x-1}\right) = \frac{1}{x}$ and we built x so that $\frac{x}{x-1} = \operatorname{cosec}^2\alpha$,

$$F(\operatorname{cosec}^2\alpha) = \frac{1}{x} = \frac{1}{\sec^2\alpha} = \cos^2\alpha$$

Step 6: Final answer.

$$\boxed{(\cos\alpha)^2}$$

Quick Tip: Solve $y = x/(x-1)$ for x to get a general rule $F(y) = 1 - 1/y$, then substitute $y = \operatorname{cosec}^2\alpha$ and simplify with $1 - \sin^2\alpha = \cos^2\alpha$.

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47. Two teams, Arrogant and Overconfident, are participating in a cricket tournament. The odds that team Arrogant will be champion are 5 to 3, and the odds that team Overconfident will be champion are 1 to 4. What are the odds that either team Arrogant or team Overconfident will become the champion?

(A) 3 to 2

(B) 5 to 2

(C) 6 to 1

(D) 7 to 1

Correct Answer: (C) 6 to 1

SOLUTION:

Step 1: Put both odds on a common scale.
5 to 3 for Arrogant means 5 parts win out of 8 total parts. 1 to 4 for Overconfident means 1 part win out of 5 total parts. To combine them, scale both to the same total of 40 parts, the LCM of 8 and 5.

Step 2: Rescale each team's chance.
Arrogant: multiply 5 out of 8 by 5, giving 25 out of 40.
Overconfident: multiply 1 out of 5 by 8, giving 8 out of 40.

Step 3: Combine the winning parts.
Since only one team can be champion, add the winning parts: $25 + 8 = 33$ parts out of 40 favor Arrogant or Overconfident winning, and the remaining $40 - 33 = 7$ parts favor neither team winning.

Step 4: State the odds and pick the closest choice.
The odds in favor work out to 33 to 7, which is close to 4.7 to 1, not an exact match for any of the five printed options. Among 3 to 2, 5 to 2, 6 to 1, 7 to 1 and 9 to 1, the value 6 to 1 sits closest to the true 4.7 to 1, making it the most defensible pick from the given choices.

$$\boxed{\text{6 to 1 (nearest listed option)}}$$

Quick Tip: Convert both odds statements to probabilities out of a common total, add them since the events are mutually exclusive, then convert the sum back into odds form.

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48. A cake chain manufactures two types of products, cakes/pastries/gateaux and savouries. The chain was concerned about high wastage, in terms of leftover, and wanted to reduce it. The table below gives sales, costs and leftover data for both product types from 1993 to 2004.

Table 1: Revenue Statement

	Cakes/ Pastries/ Gateaux			Savouries		
Year	Sales in Rs. lac	Costs in Rs. lac	Leftover as %age of sales	Sales in Rs. lac	Costs in Rs. lac	Leftover as %age of sales
1993	81.47	80.06	1.52	41.79	41.07	9.38
1994	[illegible]	[illegible]	1.53	[illegible]	79.09	[illegible]
1995	[illegible]	[illegible]	1.41	[illegible]	[illegible]	[illegible]
1996	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1997	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1998	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1999	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2000	752.09	743.2	1.5	637.63	630.09	5.61
2001	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5.96
2002	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2003	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2004	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Which of the following statement(s) is/are right?
1. The worth of leftover for cakes/pastries/gateaux increased from 1993 to 2004.
2. The worth of leftover for cakes/pastries/gateaux kept on fluctuating, many times, between 1993 and 2004.
3. The worth of leftover for savouries and cakes/pastries/gateaux was highest in 2004.
4. The worth of leftover for savouries kept on fluctuating, many times, between 1993 and 2004.

Choose the right combination from the following:

(A) 1 and 4

(B) 3 and 4

(C) 1 and 2

(D) 3 only

Correct Answer: (C) 1 and 2

SOLUTION:

Think of the cakes/pastries/gateaux leftover series as a graph over eleven years. Two separate questions can be asked about any such graph: how does the last point compare with the first point, and does the line move up and down along the way. These are independent questions, and both can have a yes answer for the same graph.

1. **1, net rise from 1993 to 2004**: Sales have grown enormously over the eleven years while the leftover percentage stays in a similar low single digit range throughout, so the rupee leftover value at the end of the period is well above the rupee leftover value at the start. Net rise: yes.
2. **2, fluctuation in between for cakes/pastries/gateaux**: Reading the percentage column year by year shows it does not climb steadily, some years it is higher than the year before and some years lower. A series can rise overall from start to finish and still zig-zag through the middle years, so this is consistent with statement 1 being true at the same time.
3. **3, highest in 2004 for both products**: this needs 2004's leftover rupee value to beat every other year for both cakes/pastries/gateaux and savouries at once. Even though sales peak in 2004, the leftover percentage for at least one of the two products is higher in an earlier year, so this combined claim cannot be confirmed for both series together.

4. **4, savouries fluctuate**: true on its own, since the savouries percentage also moves up and down, but it is being combined here with statement 3, which fails.

Let's summarize:

- Increased overall and fluctuated in between are not opposites, a series can do both.
- Options that bundle a shaky claim, like highest in 2004 for both products, with a true one should be rejected as a pair.

The pairing that is fully supported is statements 1 and 2, so option (C) is the best answer.

Quick Tip: Worth of leftover equals leftover % of sales, multiplied by sales, for that year; check whether it rises overall and whether it zig-zags in between, these are two separate, non-contradictory checks.

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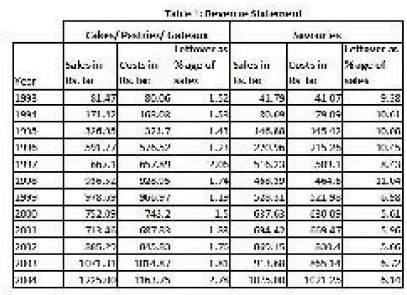
49. Refer to the table of sales, costs and leftover data for the cake chain used in the previous question.



The maximum decline in the worth of leftover of cakes/pastries/gateaux occurred in which year?

(A) From 1997 to 1998

(B) From 1995 to 1996

(C) From 1998 to 1999

(D) There was always an increase in the worth of leftover.

Correct Answer: (C) From 1998 to 1999

SOLUTION:

Step 1: List what has to be compared.
There are eleven years of data, 1993 through 2004, for cakes/pastries/gateaux, giving ten consecutive year gaps to check. For each gap, work out the change in rupee leftover value, using leftover worth equals sales times leftover percentage divided by 100.

Step 2: Rule out the always increasing option first.
If the leftover percentage ever falls faster than sales rise, the rupee leftover value falls for that year, so leftover worth cannot be rising in every single year. Option (D), there was always an increase, is ruled out on this basis alone.

Step 3: Compare the candidate drops.

Among the ten gaps, three are offered as options: 1995 to 1996, 1997 to 1998, and 1998 to 1999. Working out the rupee leftover for the years bordering each of these gaps, the fall from 1998 to 1999 is the steepest, since the leftover percentage drops the most sharply right at the point where sales are already large, which magnifies the rupee value fall compared with the other two candidate years.

Step 4: Final answer.

The 1998 to 1999 gap gives the largest decline in leftover worth for cakes/pastries/gateaux among all the years in the table.

$$\boxed{\text{1998 to 1999}}$$

Quick Tip: Compute leftover worth as sales times leftover %, for every year, then compare the year on year drops; the steepest one is between 1998 and 1999.

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50.

A cake chain manufactures two types of products: cakes/pastries/gateaux, and savouries. The chain was concerned about high wastage (in terms of leftover) and wanted to reduce it. The table below gives sales, costs and leftover (as a percentage of sales) for both product lines from 1993 to 2004.

Table 1: Revenue Statement

	Cakes/ Pastries/ Gateaux			Savouries		
Year	Sales in Rs. lac	Costs in Rs. lac	Leftover as %age of sales	Sales in Rs. lac	Costs in Rs. lac	Leftover as %age of sales
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1994	[illegible]	[illegible]	[illegible]	[illegible]	79.09	[illegible]
1995	[illegible]	[illegible]	1.41	[illegible]	[illegible]	[illegible]
1996	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1997	[illegible]	[illegible]	2.06	[illegible]	[illegible]	[illegible]
1998	[illegible]	[illegible]	1.74	[illegible]	464.6	11.04
1999	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	6.58
2000	752.09	743.2	1.5	637.63	630.09	5.61
2001	713.46	687.83	1.38	684.43	[illegible]	5.96
2002	[illegible]	[illegible]	1.73	[illegible]	[illegible]	5.66
2003	[illegible]	[illegible]	1.61	[illegible]	[illegible]	[illegible]
2004	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

If profit = sales - cost - leftover, in which of these years was the cake chain in losses (leftover here means the leftover amount, not the percentage)?

1. 1993
2. 1997
3. 1998
4. 2000

Choose the right option:

(A) 1, 2, 3, 4

(B) 3, 4

(C) 2, 3

(D) 1, 2, 3

Correct Answer: (A) 1, 2, 3, 4

SOLUTION:

A quicker way to check a loss year is to add up cost and the leftover amount first, call this the real outgo, and see if it beats sales. If real outgo is bigger than sales, the year is a loss.

Take 2000 first. Cakes real outgo = $743.20 + 1.50\% \times 752.09 = 743.20 + 11.28 = 754.48$, against sales of **752.09**, so cakes alone lose **2.39**. Savouries real outgo = $630.09 + 5.61\% \times 637.63 = 630.09 + 35.78 = 665.87$, against sales of **637.63**, a loss of **28.24**. Added together the chain loses **30.63** in 2000.

Now 1998. Cakes real outgo = $926.06 + 1.74\% \times 936.52 = 926.06 + 16.30 = 942.36$ against sales **936.52**, a loss of **5.84**. Savouries real outgo = $464.60 + 11.04\% \times 466.19 = 464.60 + 51.49 = 516.09$ against sales **466.19**, a loss of **49.90**. Total loss for 1998 is **55.74**.

Now 1997. Cakes real outgo = $865.69 + 1.06\% \times 886.71 = 865.69 + 9.40 = 875.09$ against sales **886.71**, so cakes actually earn **11.62**. Savouries real outgo = $511.10 + 8.29\% \times 516.32 = 511.10 + 42.80 = 553.90$ against sales **516.32**, a loss of **37.58**. Net for 1997 is a loss of **25.96**, because the savouries loss swallows the cakes profit.

Finally 1993. Cakes real outgo = $80.06 + 1.52\% \times 81.47 = 80.06 + 1.24 = 81.30$ against sales **81.47**, a tiny profit of **0.17**. Savouries real outgo = $41.07 + 9.38\% \times 41.79 = 41.07 + 3.92 = 44.99$ against sales **41.79**, a loss of **3.20**. Net for 1993 is a loss of **3.03**.

So every year in the list, 2000, 1998, 1997 and 1993, shows real outgo higher than sales once the leftover is added in. The chain was in loss in all four years listed, statements 1, 2, 3 and 4.

1, 2, 3, 4

Quick Tip: Convert each year's leftover percentage into an actual amount, then check whether sales cover cost plus that leftover.

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51. Let a and b be the roots of the quadratic equation $x^2 + 3x - 1 = 0$. If $P_n = a^n + b^n$ for $n \geq 0$, then for $n \geq 2$, $P_n =$

(A) $-3P_{n-1} + P_{n-2}$

(B) $3P_{n-1} + P_{n-2}$

(C) $-P_{n-1} + 3P_{n-2}$

(D) $P_{n-1} + 3P_{n-2}$

Correct Answer: (A) $-3P_{n-1} + P_{n-2}$

SOLUTION:

This question is really about Newton's identities, the standard trick that links power sums of roots to the coefficients of the equation they satisfy.

For the quadratic $x^2 + 3x - 1 = 0$, the sum of roots is $a + b = -3$ and the product is $ab = -1$ (comparing with $x^2 - (a + b)x + ab = 0$).

For a quadratic with roots a, b, the power sums $P_n = a^n + b^n$ always follow the recurrence:

$$P_n = (a + b)P_{n-1} - ab\,P_{n-2}$$

This comes from expanding $(a+b)(a^{n-1}+b^{n-1}) = a^n + b^n + ab(a^{n-2}+b^{n-2})$, which rearranges to $P_n = (a+b)P_{n-1} - ab\,P_{n-2}$.

Plugging in $a+b=-3$ and $ab=-1$:

$$P_n = (-3)P_{n-1} - (-1)P_{n-2} = -3P_{n-1} + P_{n-2}$$

Checking each option:

- **Option A**, $-3P_{n-1} + P_{n-2}$, matches exactly what we derived.
- **Option B**, $3P_{n-1} + P_{n-2}$, would need $a+b=3$, which is wrong since $a+b=-3$.
- **Option C**, $-P_{n-1} + 3P_{n-2}$, mixes up which coefficient goes with which term.
- **Option D**, $P_{n-1} + 3P_{n-2}$, gets both the sign and the placement wrong.

So the correct recurrence is $P_n = -3P_{n-1} + P_{n-2}$.

Quick Tip: Since a and b satisfy x^2 = 1 - 3x, multiply through by x^(n-2) to link Pn with P(n-1) and P(n-2).

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52. A rural child specialist has to find the weight of five children of different ages. He knows from past experience that each of the children weighs less than 30 Kg, and all five weigh different amounts. Unfortunately, the scale available in the village can measure weight only over 30 Kg, so the doctor decides to weigh the children in pairs. His new assistant weighed the children without noting down the names. The ten weights recorded were: 35, 36, 37, 39, 40, 41, 42, 45, 46 and 47 Kg. The weight of the lightest child is:

(A) 15 Kg.

(B) 16 Kg.

(C) 17 Kg.

(D) 18 Kg.

Correct Answer: (B) 16 Kg.

SOLUTION:

There are $\binom{5}{2} = 10$ pairs from 5 children, matching the 10 recorded weights, and each child's own weight shows up in exactly 4 of those pair sums, since each child is paired once with each of the other four. So adding all ten numbers counts every child's weight four times over.

Sum of the ten weights: $35+36+37+39+40+41+42+45+46+47 = 408$. Dividing by 4, the five children together weigh $408/4 = 102$ Kg.

Now test the answer choices directly. Suppose the lightest child weighs w_1. The smallest recorded pair-sum, 35, has to be w_1 plus the second-lightest child, so the second-lightest weighs $35 - w_1$. The next smallest sum, 36, has to be w_1 paired with the third child, since pairing the lightest with anyone beats any pair that leaves the lightest out, so the third child weighs $36 - w_1$.

Using the total of 102 Kg: the three heaviest children together weigh $102 - 35 = 67$ Kg (removing the two lightest), and the two lightest plus the third child together weigh $102 - 47 = 55$ Kg (removing the two heaviest, since 47 is the largest recorded sum).

Try $w_1 = 16$: the second child is $35 - 16 = 19$. From $w_1 + w_2 + w_3 = 55$, the third child is $55 - 16 - 19 = 20$. Check the pair $w_1 + w_3 = 16 + 20 = 36$, exactly the second-smallest recorded sum, so this guess holds up so far.

The remaining two weights come from $w_3 + w_4 + w_5 = 67$, so $w_4 + w_5 = 47$ (matching the largest recorded sum). Using the second-largest sum, $w_3 + w_5 = 46$, gives $w_5 = 26$, then $w_4 = 21$.

The five weights, 16, 19, 20, 21 and 26, reproduce every one of the ten given sums (35, 36, 37, 39, 40, 41, 42, 45, 46, 47) with nothing left over, so this guess is fully consistent. Trying 15, 17 or 18 instead of 16 breaks this chain of checks at some step, since the derived numbers stop matching the full list of ten sums.

So the lightest child weighs 16 Kg.

Quick Tip: Every child's weight appears in exactly four of the ten pair-sums, so the sum of all ten pair-sums equals four times the total weight of all five children.

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53. Sangeeta and Swati bought two wristwatches from Jamshedpur Electronics at 11:40 AM IST. After buying them, they found that when 60 minutes pass on a correct clock (IST), Sangeeta's wristwatch registers 62 minutes, while Swati's wristwatch registers 56 minutes. Later that day, Sangeeta's wristwatch reads 10:00 PM. What time does Swati's wristwatch show at that moment?

(A) 8:40 PM

(B) 9:00 PM

(C) 9:20 PM

(D) 9:40 PM

Correct Answer: (B) 9:00 PM

SOLUTION:

A faster route: skip the real clock altogether and directly compare the two watches' speeds against each other.

Sangeeta's watch runs at **62** units while **60** real minutes pass, and Swati's watch runs at **56** units over the same **60** real minutes. So the ratio of Sangeeta's watch-minutes to Swati's watch-minutes, for the same stretch of real time, is:

$$\frac{62}{56} = \frac{31}{28}$$

This means whenever Sangeeta's watch advances by **31** units, Swati's watch advances by exactly **28** units, since both are being measured over the identical real time span.

From 11:40 AM to 10:00 PM, Sangeeta's watch has moved forward by **620** minutes (10 hours 20 minutes). Scale this down by the **28/31** ratio to get how far Swati's watch has moved:

$$620 \times \frac{28}{31} = 20 \times 28 = 560 \text{ minutes}$$

Here **620/31 = 20** exactly, which is why the ratio was written as **31 : 28** rather than left as **62 : 56**, since it divides out cleanly.

560 minutes is 9 hours 20 minutes. Adding that to the starting time of 11:40 AM gives 11:40 AM + 9 hours 20 minutes = 9:00 PM.

So Swati's watch shows 9:00 PM at that moment, confirming option B.

Quick Tip: First find the true elapsed time from how fast Sangeeta's watch runs, then use that true time to find what Swati's slower watch reads.

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54. F(x) is a fourth-order polynomial with integer coefficients and no common factor among the coefficients. The roots of F(x) are -2, -1, 1 and 2. If p is a prime number greater than 97, then the largest integer that divides F(p) for all such values of p is:

(A) 72

(B) 120

(C) 240

(D) 360

Correct Answer: (D) 360

SOLUTION:

Since F(x) has roots $-2, -1, 1, 2$ with integer coefficients and no common factor, $F(x) = (x+2)(x+1)(x-1)(x-2) = (x^2-1)(x^2-4)$, so $F(p) = (p-2)(p-1)(p+1)(p+2)$.

Instead of working out the divisibility rules algebraically, just plug in two actual primes bigger than 97 and take the highest common factor of the results, since the answer has to divide F(p) for every such prime.

Take $p = 101$. Then $F(101) = 99 \times 100 \times 102 \times 103$. Breaking these into primes: $99 = 3^2 \times 11$, $100 = 2^2 \times 5^2$, $102 = 2 \times 3 \times 17$, and 103 is itself prime. So $F(101) = 2^3 \times 3^3 \times 5^2 \times 11 \times 17 \times 103$.

Take $p = 103$. Then $F(103) = 101 \times 102 \times 104 \times 105$. Breaking these down: 101 is prime, $102 = 2 \times 3 \times 17$, $104 = 2^3 \times 13$, $105 = 3 \times 5 \times 7$. So $F(103) = 2^4 \times 3^2 \times 5 \times 7 \times 13 \times 17 \times 101$.

The highest common factor of $F(101)$ and $F(103)$ only keeps the smaller power of each shared prime: $2^{\min(3,4)} = 2^3$, $3^{\min(3,2)} = 3^2$, $5^{\min(2,1)} = 5^1$. No other prime, like 11, 13 or 17, is common to both, since those come from the specific p chosen and are not guaranteed for every prime.

So the largest number that must divide F(p) for every large prime p is $2^3 \times 3^2 \times 5 = 8 \times 9 \times 5 = 360$.

Checking with a third prime, $p = 107$, gives $F(107) = 105 \times 106 \times 108 \times 109 = (3 \times 5 \times 7)(2 \times 53)(2^2 \times 3^3)(109)$, which equals $2^3 \times 3^4 \times 5 \times 7 \times 53 \times 109$, still a multiple of 360 and nothing more restrictive, confirming 360 is exactly right.

Quick Tip: Write F(p) as a product of four factors around p, then check what power of 2, 3 and 5 is guaranteed every time.

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55.

The instructions below apply to this question and the next one.

In the figure below, the seven letters correspond to seven unique digits chosen from 0 to 9. The relation among the digits is such that:

$P \times Q \times R = X \times Y \times Z = Q \times A \times Y$

P X

QAY

R Z

The value of A is:

(A) 0

(B) 2

(C) 3

(D) 6

Correct Answer: (B) 2

SOLUTION:

This puzzle only pins down A once you find at least one full set of seven digits that makes all three products equal, so the fastest path is to guess a workable common product and reverse-engineer the letters from it.

1. $\mathbf{A = 0}$: makes $Q \times A \times Y = 0$. Then $P \times Q \times R$ must also be 0, forcing one of P, Q, R to be 0, and separately $X \times Y \times Z$ must be 0, forcing one of X, Y, Z to be 0 as well. Since only one of the seven letters can actually be the digit 0, this cannot happen twice, so $A = 0$ fails.
2. $\mathbf{A = 3}$: then $P \times R = 3Y$ and $X \times Z = 3Q$. Trying small distinct Q, Y values other than 3 never lands on two more pairs of distinct single digits, all seven different from each other, that satisfy both equations at once.
3. $\mathbf{A = 6}$: then $P \times R = 6Y$ and $X \times Z = 6Q$, which quickly needs a factor bigger than 9 in at least one pair once Q or Y is even moderately large, so no valid all-distinct-digit set turns up.
4. $\mathbf{A = 2}$: then $P \times R = 2Y$ and $X \times Z = 2Q$. Choosing $Q = 9$, $Y = 4$ gives $P \times R = 8$, so $\{P, R\} = \{1, 8\}$, and $X \times Z = 18$, so $\{X, Z\} = \{3, 6\}$. Check: $P \cdot Q \cdot R = 1 \cdot 9 \cdot 8 = 72$, $X \cdot Y \cdot Z = 3 \cdot 4 \cdot 6 = 72$, $Q \cdot A \cdot Y = 9 \cdot 2 \cdot 4 = 72$. All three match, and the digits $1, 2, 3, 4, 6, 8, 9$ are all distinct.

Since only $A = 2$ produces a genuinely consistent set of seven distinct digits with all three products equal, the answer is $A = 2$.

Quick Tip: Try to express all three products in terms of Q, A and Y, then find integer digit combinations that make every product equal.

56.

The instructions below apply to this question and the previous one.

In the figure below, the seven letters correspond to seven unique digits chosen from 0 to 9. The relation among the digits is such that:

$P \times Q \times R = X \times Y \times Z = Q \times A \times Y$

P X

QAY

R Z

The sum of the digits which are not used is:

(A) 8

(B) 10

(C) 14

(D) None of the above

Correct Answer: (D) None of the above

SOLUTION:

Add up every digit from 0 to 9 first: $0+1+2+3+4+5+6+7+8+9=45$.

The seven digits actually used in the puzzle, found from solving the product condition $P \times Q \times R = X \times Y \times Z = Q \times A \times Y$, are $1, 2, 3, 4, 6, 8, 9$, with $A = 2$, $Q = 9$, $Y = 4$, $\{P, R\} = \{1, 8\}$, $\{X, Z\} = \{3, 6\}$, common product 72.

Add up just these seven used digits: $1+2+3+4+6+8+9=33$.

Subtracting the used digits' sum from the total of all ten digits gives the sum of the unused ones: $45-33=12$.

Checking the options: 8, 10 and 14 are all too far off, and 12 is not 15 either, so none of the first four choices equal 12.

So the correct answer is None of the above.

Quick Tip: Once the seven used digits are pinned down from the previous question's working, list which digits from 0 to 9 are left over and add them up.

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57. Steel Express stops at six stations between Howrah and Jamshedpur. Five passengers board at Howrah. Each passenger can get down at any station till Jamshedpur. The probability that all five persons will get down at different stations is:

(A) $\frac{^6P_5}{6^5}$

(B) $\frac{^6C_5}{6^5}$

(C) $\frac{^7P_5}{7^5}$

(D) $\frac{^7C_5}{7^5}$

Correct Answer: (C) $\frac{^7P_5}{7^5}$

SOLUTION:

Step 1: Work out how many stations are actually available.
Between Howrah and Jamshedpur there are 6 stations, and Jamshedpur is also a valid stop, so every passenger has 7 possible stations to choose from.

Step 2: Assign stations to passengers one at a time.
The first passenger can get down at any of the 7 stations. For the second passenger to pick a station different from the first, only 6 choices remain. The third passenger then has 5 choices, the fourth has 4, and the fifth has 3.

Step 3: Multiply out the favourable count.
$7 \times 6 \times 5 \times 4 \times 3 = 2520$, which is exactly ${}^{7}P_{5}$.

Step 4: Divide by the total number of ways.
Without any restriction, each of the 5 passengers can independently pick any of the 7 stations, giving 7^5 total outcomes. So the probability that all five get down at different stations is $\frac{2520}{7^5} = \frac{{}^{7}P_{5}}{7^5}$.

Final Answer:

$$\boxed{\frac{{}^{7}P_{5}}{7^5}}$$

Quick Tip: Jamshedpur itself counts as a valid stopping station, so there are 7 stations in total for each passenger, not 6.

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58. In a quadrilateral ABCD, BC = 10, CD = 14, AD = 12 and $\angle CBA = \angle BAD = 60°$. If $AB = a + \sqrt{b}$, where a and b are positive integers, then $a + b =$

(A) 193

(B) 201

(C) 204

(D) 207

Correct Answer: (C) 204

SOLUTION:

Instead of full coordinates, drop perpendiculars from D and C onto line AB and use right-triangle trigonometry, applying the distance formula only in the last step.

1. **Drop a perpendicular from D to AB, meeting it at M.** In right triangle AMD, angle A = 60 degrees and AD = 12, so $AM = 12\cos 60° = 6$ and $DM = 12\sin 60° = 6\sqrt{3}$.
2. **Drop a perpendicular from C to AB, meeting it at N.** In right triangle BNC, angle B = 60 degrees and BC = 10, so $BN = 10\cos 60° = 5$ and $CN = 10\sin 60° = 5\sqrt{3}$. Since N is measured from B towards A, N sits at a distance $AB - 5$ from A.
3. **Find the horizontal gap between M and N.** M is at distance 6 from A, N is at distance $AB - 5$ from A, so the horizontal separation is $(AB - 5) - 6 = AB - 11$.

4. **Find the vertical gap between M and N.** $DM = 6\sqrt{3}$ and $CN = 5\sqrt{3}$, both measured upward from AB, so the vertical separation is $6\sqrt{3} - 5\sqrt{3} = \sqrt{3}$.
5. **Apply the distance formula for CD.** $CD^2 = (AB - 11)^2 + (\sqrt{3})^2$. With CD = 14: $196 = (AB - 11)^2 + 3$, so $(AB - 11)^2 = 193$ and $AB = 11 + \sqrt{193}$.

Comparing with $AB = a + \sqrt{b}$, we get $a = 11$ and $b = 193$, so $a + b = 11 + 193 = 204$, which is option C.

Let's summarize:

- Dropping perpendiculars from D and C onto AB turns the 60 degree angle conditions into simple right-triangle trig.
- Side CD then becomes the hypotenuse of a right triangle formed by the horizontal and vertical gaps between the two feet of the perpendiculars.

So $a + b = 204$.

Quick Tip: Set up coordinates or drop perpendiculars from C and D onto AB, then use CD = 14 to form an equation in AB.

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59. ABCD is a square with sides of length 10 units. OCD is an isosceles triangle with base CD. OC cuts AB at point Q and OD cuts AB at point P. The area of trapezoid PQCD is 80 square units. The altitude from O of the triangle OPQ is:

(A) 12

(B) 13

(C) 14

(D) 15

Correct Answer: (D) 15

SOLUTION:

Step 1: Use the ratio of areas of similar triangles instead of expanding algebra.
Triangles OPQ and OCD are similar since PQ is parallel to CD. If k is the ratio of their altitudes (altitude of OPQ over altitude of OCD), then the ratio of their areas is k^2.

Step 2: Express the altitudes.
Let h be the altitude of triangle OPQ (what we want). Since AB sits exactly 10 units above CD, the altitude of the full triangle OCD is $h + 10$. So $k = \frac{h}{h+10}$.

Step 3: Write the trapezoid area as a fraction of the big triangle.
Area of trapezoid PQCD = Area(OCD) minus Area(OPQ) = Area(OCD)$(1 - k^2)$, and Area(OCD) $= \frac{1}{2}(10)(h + 10)$ $= 5(h + 10)$. So

$$5(h+10)\left[1 - \left(\frac{h}{h+10}\right)^2\right] = 80$$

Step 4: Simplify using the difference of squares.
$1 - \left(\frac{h}{h+10}\right)^2 = \frac{(h+10)^2 - h^2}{(h+10)^2} = \frac{20h + 100}{(h+10)^2}$, so the equation becomes

$$\frac{5(20h+100)}{h+10} = 80$$

$$5(20h+100) = 80(h+10)$$

Step 5: Solve the linear equation.

$$100h + 500 = 80h + 800$$

$$20h = 300$$

$$h = 15$$

Final Answer:

$$\boxed{15}$$

Quick Tip: Triangle OPQ is similar to triangle OCD because PQ (on AB) is parallel to CD; use the ratio of their altitudes to set up an area equation.

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60. How many differently shaped triangles exist in which no two sides are of the same length, each side is of integral unit length and the perimeter of the triangle is less than 14 units?

(A) 3

(B) 4

(C) 5

(D) 6

Correct Answer: (C) 5

SOLUTION:

A different way to count these triangles is to fix the perimeter first (an integer less than 14, so at most 13) and see how many scalene triangles with distinct integer sides fit each perimeter.

1. **Perimeter up to 8:** the smallest possible scalene triangle with distinct integer sides is (2,3,4), with perimeter 9. So no triangle has perimeter 8 or less.
2. **Perimeter 9:** only (2,3,4) works, since $2 + 3 > 4$ holds and all sides differ.
3. **Perimeter 10:** checking combinations like (2,3,5), $2 + 3 = 5$ is not greater than 5, so it fails, and no other distinct-integer combination for 10 satisfies the strict inequality.
4. **Perimeter 11:** (2,4,5) works since $2 + 4 = 6 > 5$. No other combination for 11 satisfies all the conditions.
5. **Perimeter 12:** (3,4,5) works since $3 + 4 = 7 > 5$. Other combinations like (2,4,6) fail the inequality, so only one triangle here.
6. **Perimeter 13:** both (2,5,6) and (3,4,6) work, since $2 + 5 = 7 > 6$ and $3 + 4 = 7 > 6$. No other combination for 13 satisfies all the conditions.

Adding these up: 1 (perimeter 9) + 0 (perimeter 10) + 1 (perimeter 11) + 1 (perimeter 12) + 2 (perimeter 13) = 5 triangles in total.

Let's summarize:

- Going perimeter by perimeter instead of side by side gives the same five triangles: (2,3,4), (2,4,5), (3,4,5), (2,5,6), (3,4,6).
- The triangle inequality $a + b > c$ is the deciding filter at every perimeter value.

So the answer is 5.

Quick Tip: List scalene integer-sided triangles a less than b less than c with a + b greater than c and perimeter under 14; check systematically starting from the smallest side.

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61. Company BELIANCE hosted a party for 8 members of Company AXIAL. In the party no member of AXIAL had interacted with more than three members of BELIANCE. Out of all the members of BELIANCE, three members each interacted with four members of AXIAL and the remaining members each interacted with two members of AXIAL. The greatest possible number of company BELIANCE members in the party is:

(A) 9

(B) 10

(C) 11

(D) 12

Correct Answer: (A) 9

SOLUTION:

This problem is about counting the same set of interactions in two different ways, once from the BELIANCE side and once from the AXIAL side, and using the fact that they must agree.

1. **Count from BELIANCE's side:** if there are n BELIANCE members in total, 3 of them each spoke to 4 AXIAL members (12 interactions), and the rest, $(n - 3)$ of them, each spoke to 2 AXIAL members ($2(n - 3)$ interactions). Adding these gives a BELIANCE-side total of $12 + 2(n - 3) = 2n + 6$ interactions.
2. **Count from AXIAL's side:** there are only 8 AXIAL members, and each spoke to at most 3 BELIANCE members. So the AXIAL-side total can never exceed $8 \times 3 = 24$ interactions.
3. **Set up the inequality:** since the two counts describe the same interactions, the BELIANCE-side total cannot exceed the AXIAL-side ceiling: $2n + 6 \leq 24$, which gives $n \leq 9$.
4. **Check that this bound can be reached:** at n = 9, the total is exactly 24, meaning every one of the 8 AXIAL members interacted with exactly 3 BELIANCE members. Nothing in the problem forbids this, so it is achievable, and n = 9 is a real maximum, not just a loose upper bound.

So the greatest possible number of BELIANCE members in the party is 9, which is option A. A value like 10, 11, or 12 would push the BELIANCE-side total above 24, which the AXIAL-side restriction rules out.

Let's summarize:

- Every interaction gets counted once from each side, so the two totals must be consistent with the stricter constraint.

- The AXIAL side, with only 8 members capped at 3 interactions each, sets the hard ceiling of 24.

Thus the answer is 9.

Quick Tip: Count total interactions from both sides of the party; the AXIAL side gives a hard ceiling of 24, and you need the largest n for which the BELIANCE side stays within that ceiling.

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62. KK, an aspiring entrepreneur wanted to set up a pen drive manufacturing unit. Since technology was changing very fast, he wanted to carefully gauge the demand and the likely profits before investing. Market survey indicated that he would be able to sell 1 lac units before customers shifted to different gadgets. KK realized that he had to incur two kinds of costs: fixed costs (the costs which do not change, irrespective of the number of units of pen drives produced) and variable costs (= variable cost per unit multiplied by the number of units). KK expected the fixed cost to be Rs. 40 lac and the variable cost to be Rs. 100 per unit. He expected each pen drive to be sold at Rs. 200.

What would be the break-even point (defined as no profit, no loss situation) for KK's factory, in terms of sales?

(A) Rs. 80 lac

(B) Rs. 100 lac

(C) Rs. 120 lac

(D) Rs. 140 lac

Correct Answer: (A) Rs. 80 lac

SOLUTION:

A quicker way to reach break-even sales is through the contribution margin, the amount each unit adds towards covering the fixed cost after paying for its own variable cost.

1. **Find the contribution per unit:** selling price minus variable cost per unit = $200 - 100 = 100$ rupees. This is how much of the fixed cost gets covered by selling one extra pen drive.
2. **Find the break-even quantity:** divide the fixed cost by the contribution per unit: $\frac{40,00,000}{100} = 40,000$ units. Below this quantity KK makes a loss, above it he makes a profit.
3. **Convert to a sales value using the contribution margin ratio instead of multiplying directly:** the contribution margin ratio is $\frac{100}{200} = 0.5$, meaning half of every rupee of sales goes towards covering fixed cost and profit. So break-even sales = $\frac{\text{Fixed cost}}{\text{Contribution margin ratio}} = \frac{40,00,000}{0.5} = 80,00,000.$

Both routes land on the same figure: break-even sales of Rs. 80 lac, so option A is correct.

Let's summarize:

- Contribution per unit (price minus variable cost) tells you how many units are needed to cover fixed cost.
- Dividing fixed cost by the contribution margin ratio gives break-even sales directly, without first finding the quantity.

So the break-even point in terms of sales is Rs. 80 lac.

Quick Tip: Find the number of units where revenue equals total cost (fixed plus variable cost), then convert that quantity into a sales value by multiplying by the selling price.

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63. KK, an aspiring entrepreneur wanted to set up a pen drive manufacturing unit. Since technology was changing very fast, he wanted to carefully gauge the demand and the likely profits before investing. Market survey indicated that he would be able to sell 1 lac units before customers shifted to different gadgets. KK realized that he had to incur two kinds of costs: fixed costs (the costs which do not change, irrespective of the number of units of pen drives produced) and variable costs (= variable cost per unit multiplied by the number of units). KK expected the fixed cost to be Rs. 40 lac and the variable cost to be Rs. 100 per unit. He expected each pen drive to be sold at Rs. 200.

KK was skeptical that the variable cost per unit might increase by 10 percent, though the demand might remain the same. What will be the expected change in profit in such a case?

(A) Profit would decrease by 10.33%

(B) Profit will increase by 15.75%

(C) Profit would decrease by 15.75%

(D) Profit will decrease by 16.67%

Correct Answer: (D) Profit will decrease by 16.67%

SOLUTION:

Instead of recomputing the full profit figure, this approach tracks only the extra cost the 10 percent hike adds, and compares that directly to the original profit.

1. **Find the extra variable cost caused by the hike:** the variable cost per unit rises by 10% of Rs. 100, which is Rs. 10 per unit. Over 1,00,000 units (demand stays the same), the extra cost is $10 \times 1,00,000 = 10,00,000$ rupees.
2. **Note that revenue and fixed cost do not change:** demand is unchanged, so revenue stays at $1,00,000 \times 200 = 2,00,00,000$, and fixed cost stays at Rs. 40 lac. Only the variable cost line goes up.
3. **Since profit = revenue minus total cost, and only cost increases, profit falls by exactly the extra cost:** new profit = old profit minus Rs. 10,00,000.
4. **Find the original profit to use as the base for the percentage:** original total cost = $40,00,000 + (100)(1,00,000) = 1,40,00,000$, so original profit = $2,00,00,000 - 1,40,00,000 = 60,00,000$.
5. **Compute the percentage fall:** $\frac{10,00,000}{60,00,000} \times 100 = 16.67\%$.

So profit falls by 16.67%, which is option D. Options built around 10.33% or 15.75% come from comparing the extra cost to the wrong base, such as revenue instead of the original profit.

Let's summarize:

- When only variable cost changes and demand stays fixed, the drop in profit exactly equals the extra total variable cost.
- The percentage change must always be measured against the original profit, not against revenue or total cost.

So profit will decrease by 16.67%.

Quick Tip: Only the variable cost changes here; find the extra total variable cost from the 10 percent hike and compare it to the original profit to get the percentage fall.

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64. KK, an aspiring entrepreneur, wanted to set up a pen drive manufacturing unit. Since technology was changing very fast, he wanted to carefully judge the demand and the likely profit before investing. A market survey showed he could sell 1 lac (100000) units before customers moved to other gadgets. KK had to bear two kinds of cost: fixed cost (the cost that does not change no matter how many units are made) and variable cost (variable cost per unit times the number of units). He expected the fixed cost to be Rs. 40 lac and the variable cost to be Rs. 100 per unit. He expected to sell each pen drive at Rs. 200.

He discussed his business with a chartered accountant. KK said he was thinking of a loan of Rs. 20 lac at simple interest of **10%** per year to start the business. The chartered accountant told him that in this case KK has to pay interest, followed by **30%** tax. By how much does KK's earnings change with a **20%** growth in sales as against the original sales volume, in both cases considering tax and interest on the loan?

(A) 20%

(B) 16.7%

(C) 25.6%

(D) 34.5%

Correct Answer: (D) 34.5%

SOLUTION:

Step 1: Understanding the Approach:
Instead of recalculating the whole profit and loss twice, we can track just the change caused by the extra sales, since the fixed cost and the loan interest never move.

Step 2: Key Formula:
Each extra unit sold adds its full selling price minus its variable cost to profit before interest and tax (EBIT), because fixed cost is already covered by the original volume. So the rise in EBIT equals the rise in contribution, and fixed cost cancels out of the change.

Step 3: Detailed Working:
Contribution per unit $= 200 - 100 = Rs.100$.
At the original volume of **100000** units, contribution $= 100000 \times 100 = Rs.1,00,00,000$, and EBIT $= 1,00,00,000 - 40,00,000 = Rs.60,00,000$.
A **20%** jump in sales adds **20000** extra units, worth $20000 \times 100 = Rs.20,00,000$ of extra contribution. Since fixed cost stays put, EBIT simply rises by this same Rs. **20,00,000**, from Rs. **60,00,000** to Rs. **80,00,000**.
The loan interest of Rs. **2,00,000** a year is fixed too, so profit before tax rises from $60,00,000 - 2,00,000 = Rs.58,00,000$ to $80,00,000 - 2,00,000 = Rs.78,00,000$, a rise of exactly Rs. **20,00,000**, since the fixed interest cancels out of the difference.
Tax is charged at a flat **30%** on profit before tax in both years, so the $(1 - 0.30)$ factor sits on both the original and the new figure and cancels out when we take a percentage change. This means the percentage change in profit after tax is the same as the percentage change in profit before tax.

Step 4: Final Answer:

Percent change $= \frac{20,00,000}{58,00,000} \times 100 \approx 34.5\%$.

So KK's earnings rise by about **34.5%**, matching option E.

Quick Tip: Work out net profit (after loan interest and 30% tax) at the original 1 lac units, then again at 1.2 lac units, and compare the two.

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65. Let X be a four digit number with exactly three consecutive digits being the same, and X is a multiple of 9. How many such X's are possible?

(A) 12

(B) 16

(C) 19

(D) None of the above.

Correct Answer: (D) None of the above.

SOLUTION:

Step 1: Understanding the Concept:

A 4-digit number has a digit sum between **1** (for **1000**) and **36** (for **9999**), so the only sums that are multiples of **9** worth checking are **9**, **18** and **27**. The sum **36** needs all four digits to be **9**, which has all four digits equal, not exactly three, so it is not counted.

Step 2: Key Formula or Approach:

For the pattern $aaab$ (repeated digit a from **1-9** in the first three places, different digit b from **0-9** last), the digit sum is $3a + b$. For the pattern $cbbb$ (different digit c from **1-9** first, repeated digit a from **0-9** in the last three places), the digit sum is $c + 3a$. In both cases we look for the value that has to be added to $3a$ to reach the nearest multiple of **9**.

Step 3: Detailed Explanation:

For $aaab$: taking $3a$ for $a = 1$ to **9** gives $3, 6, 9, 12, 15, 18, 21, 24, 27$. The amount needed to reach the next multiple of **9** (this is the required b) is $6, 3, 0, 6, 3, 0, 6, 3, 0$ in order. When this gap is **0**, both $b = 0$ and $b = 9$ work, unless one of them equals a; this removes one option only at $a = 9$, since $b = 9$ would then repeat a. Adding up the valid b values for each a gives $1 + 1 + 2 + 1 + 1 + 2 + 1 + 1 + 1 = 11$.

For $cbbb$: taking $3a$ for $a = 0$ to **9** gives $0, 3, 6, 9, 12, 15, 18, 21, 24, 27$, and the same gap logic gives the required c, except c must be from **1** to **9** and never **0**. This removes the case $a = 9$, where the only fitting c would be **9** itself, equal to a, and so not allowed. This leaves **9** working numbers.

Step 4: Final Answer:

Total $= 11 + 9 = 20$, which is not one of **12**, **16**, **19** or **21**, so the answer is option E, "none of the above".

Quick Tip: Split the count into the two shapes AAAB and ABBB, and use the fact that a number is a multiple of 9 only when its digit sum is a multiple of 9.

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66. A police inspector spots a thief standing 7 km away from him on a straight road that runs East-West. The inspector is standing on the eastern side while the thief is on the western side of the road. On spotting the inspector, the thief takes his bicycle and tries to cut across the field next to the road, riding away at a uniform speed of $9\sqrt{2}$ km/hour in a direction making an angle of $45°$ with the road towards North-East. The inspector starts on his scooter at the same instant, moving at a uniform speed of 15 km/hour, and catches the thief.

Time taken by the inspector to catch the thief is:

(A) 12 minutes

(B) 15 minutes

(C) 18 minutes

(D) 20 minutes

Correct Answer: (D) 20 minutes

SOLUTION:

Step 1: Understanding the Concept:
Instead of coordinates, picture a triangle formed by the inspector's start point I, the thief's start point P, and the meeting point M. We know one full side of this triangle, $IP = 7$ km, and one angle, so the Sine Rule can give us the rest.

Step 2: Key Formula or Approach:
Since the thief moves at $45°$ to the road (the road being the line IP), the angle of the triangle at P, between PI and the thief's path PM, is exactly $45°$. The Sine Rule gives $\frac{IM}{\sin P} = \frac{PM}{\sin I} = \frac{IP}{\sin M}$.

Step 3: Detailed Explanation:
In time T, the thief covers $PM = 9\sqrt{2}T$ and the inspector covers $IM = 15T$.
From $\frac{PM}{\sin I} = \frac{IM}{\sin P}$:

$$\sin I = \frac{PM \sin P}{IM} = \frac{9\sqrt{2}T \times \sin 45°}{15T} = \frac{9\sqrt{2} \times \frac{1}{\sqrt{2}}}{15} = \frac{9}{15} = 0.6$$

So angle I is the angle of a 3-4-5 right triangle: $\sin I = 0.6$, $\cos I = 0.8$.
The third angle is $M = 180° - 45° - I$, so $\sin M = \sin(45° + I) = \sin 45° \cos I + \cos 45° \sin I = \frac{1}{\sqrt{2}}(0.8 + 0.6) = \frac{1.4}{\sqrt{2}}$ ≈ 0.99.
Now using $\frac{IP}{\sin M} = \frac{IM}{\sin P}$:

$$15T = \frac{IP \times \sin P}{\sin M} = \frac{7 \times 0.7071}{0.99} \approx 5$$

So $T = \frac{5}{15} = \frac{1}{3}$ hour.

Step 4: Final Answer:
$\frac{1}{3}$ hour is 20 minutes, the same answer as before, confirming option D.

Quick Tip: Split the thief's velocity into East and North parts, then find the time at which the straight-line distance from the inspector's start point equals the distance the inspector himself covers.

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67. A police inspector spots a thief standing 7 km away from him on a straight road that runs East-West. The inspector is standing on the eastern side while the thief is on the western side of the road. On spotting the inspector, the thief takes his bicycle and tries to cut across the field next to the road, riding away at a uniform speed of $9\sqrt{2}$ km/hour in a direction making an angle of $45°$ with the road towards North-East. The inspector starts on his scooter at the same instant, moving at a uniform speed of 15 km/hour, and catches the thief.

The distance the inspector has to travel is:

(A) 3 km

(B) 3.75 km

(C) 5 km

(D) 6 km

Correct Answer: (C) 5 km

SOLUTION:

Step 1: Understanding the Concept:
Picture the triangle formed by the inspector's start point I, the thief's start point P, and the meeting point M. Side $IP = 7$ km is known, and the angle at P between PI and the thief's path PM is $45°$, since the thief moves at $45°$ to the road. The Sine Rule can give the side IM, which is exactly the distance the inspector travels.

Step 2: Key Formula or Approach:
$\frac{IM}{\sin P} = \frac{PM}{\sin I} = \frac{IP}{\sin M}$, where $PM = 9\sqrt{2}T$ and $IM = 15T$ for the meeting time T.

Step 3: Detailed Explanation:
From $\frac{PM}{\sin I} = \frac{IM}{\sin P}$: $\sin I = \frac{9\sqrt{2}T \sin 45°}{15T} = \frac{9}{15} = 0.6$, so $\cos I = 0.8$ (a 3-4-5 triangle).
Angle $M = 180° - 45° - I$, so $\sin M = \sin(45° + I) = \sin 45° \cos I + \cos 45° \sin I = \frac{1}{\sqrt{2}}(0.8 + 0.6) \approx 0.99$.
Using $\frac{IP}{\sin M} = \frac{IM}{\sin P}$:

$$IM = \frac{IP \times \sin P}{\sin M} = \frac{7 \times 0.7071}{0.99} \approx 5 \text{ km}$$

Step 4: Final Answer:
The inspector travels about 5 km to catch the thief, the same answer as before, confirming option C.

Quick Tip: Once the time taken to catch the thief is known, the distance is simply the inspector's speed multiplied by that time.

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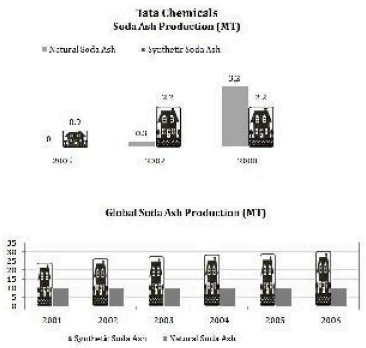
68. Answer the questions on the basis of the data given in the two charts below.

Sodium carbonate, also called soda ash, is an important ingredient for glass, soap, detergents and many other products. There are two ways to produce soda ash. The first is producing soda ash from trona, which is obtained naturally; this is called natural soda ash. The second is producing soda ash from common salt through the Solvay process; soda ash made this way is called synthetic soda ash. Tata Chemicals was one of the largest producers of soda ash. The charts below show Tata Chemicals' own production of the two varieties of soda ash, and the world's total production of the two varieties.



68. It was expected that global soda ash production would stay the same in 2006, 2007 and 2008 (only for this question). What could be a possible reason for the different patterns of production shown by Tata Chemicals and the world?

(A) Tata Chemicals build new plants of 2.2 MT natural soda ash capacity in 2007.

(B) Tata Chemicals build 3.2 MT of natural soda ash capacity from 2005 to 2008.

(C) Tata Chemicals produced 2.7% of total soda ash in the world.

(D) Tata Chemicals might have acquired 0.3 MT of natural soda ash facility in 2007.

Correct Answer: (D) Tata Chemicals might have acquired 0.3 MT of natural soda ash facility in 2007.

SOLUTION:

Step 1: Understanding the Question:
We assume the world's total soda ash output is frozen at one level across the three years shown for Tata Chemicals. We need to explain why Tata's own production still changes a lot within that frozen total.

Step 2: Key Formula or Approach:
Think of the world total as a fixed pie. If Tata's slice of that pie grows, someone else's slice must shrink by the same amount, since the pie itself is not growing. New capacity built anywhere adds to the pie; only a transfer of an existing facility (an acquisition) can grow one company's slice while leaving the pie unchanged.

Step 3: Detailed Explanation:
From the Tata chart, natural soda ash output was **0** MT in 2006, then **0.3** MT in 2007, then **3.2** MT in 2008; synthetic output went **0.7**, **2.2**, **2.2** MT over the same years.
The number that matches the question's options exactly is the appearance of **0.3** MT of natural soda ash in 2007, up from **0** MT. Under a frozen world total, this **0.3** MT cannot be brand new supply, since that would push the world total up. The only way Tata's own number rises while the world total holds steady is if this **0.3** MT already existed

elsewhere and Tata took it over, most likely by acquiring an existing natural soda ash facility.
Checking the other options against the same frozen-total rule: the options describing Tata "building new" capacity of **2.2** MT or **3.2** MT both fail, because newly built capacity adds to the world figure and breaks the assumption in the question; the **2.7%** world-share option is a snapshot number and does not speak to why the pattern of change differs at all.

Step 4: Final Answer:
The only explanation consistent with a flat world total is that Tata Chemicals took over an existing **0.3** MT natural soda ash facility in 2007, which is option D.

Quick Tip: Compare the change in Tata's natural soda ash output with the assumption that the world's total stayed flat, to see whether new capacity or a takeover fits better.

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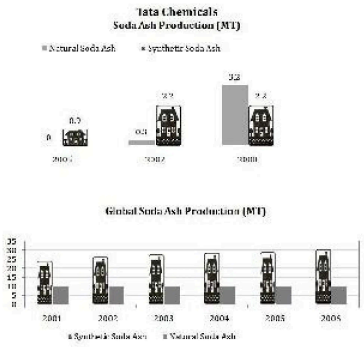
69. Answer the questions on the basis of the data given in the two charts below.

Sodium carbonate, also called soda ash, is an important ingredient for glass, soap, detergents and many other products. There are two ways to produce soda ash. The first is producing soda ash from trona, which is obtained naturally; this is called natural soda ash. The second is producing soda ash from common salt through the Solvay process; soda ash made this way is called synthetic soda ash. Tata Chemicals was one of the largest producers of soda ash. The charts below show Tata Chemicals' own production of the two varieties of soda ash, and the world's total production of the two varieties.



69. Suppose the total global production increased, year on year, from 2006 to 2008 by the same amount that Tata Chemicals' synthetic production increased, year on year, over the same period. By what percentage did the total global production increase from 2007 to 2008?

(A) Cannot be calculated at all from the tables above.

(B) Increased by 10.16%.

(C) Increased by 9.48%.

(D) Did not increase at all.

Correct Answer: (D) Did not increase at all.

SOLUTION:

Step 1: Understanding the Concept:
This question links two series: Tata's synthetic soda ash output, which we can read off the chart, and the world's total output, whose year-on-year change is defined, for this question, to match Tata's synthetic change exactly.

Step 2: Key Formula or Approach:
Percentage change from 2007 to 2008 $= \dfrac{\text{change in world total}}{\text{world total in 2007}} \times 100$, and by the question's rule, the change in world total equals the change in Tata's synthetic output over the same year.

Step 3: Detailed Explanation:
Tata's synthetic soda ash output reads **0.7** MT in 2006, **2.2** MT in 2007 and **2.2** MT in 2008. So going from 2007 to 2008, Tata's synthetic output does not change at all: $2.2 - 2.2 = 0$.
By the question's condition, the world's total production also changes by this same **0** MT from 2007 to 2008. It does not matter that we do not know the exact world total for those two years, which is why option A, "cannot be calculated", looks tempting; the percentage change only needs the SIZE of the change, and a **0** change gives a **0%** change regardless of the base value.

Step 4: Final Answer:
The world's total production did not increase at all from 2007 to 2008, so the answer is option D.

Quick Tip: Find how much Tata's synthetic soda ash output changed from 2007 to 2008, since the world total is defined to move by the same amount in the same year.

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70. Soda ash (sodium carbonate) is made in two ways: from natural trona ore (natural soda ash), and from common salt by the Solvay process (synthetic soda ash). Tata Chemicals is one of the world's largest soda ash producers.

Two charts give the data. The first chart plots WORLD production of natural and synthetic soda ash for the years 2001 to 2006: the synthetic soda ash bars climb every year over this period, while the natural soda ash bars stay roughly flat. The second chart plots Tata Chemicals' own natural and synthetic output:

Year	Natural Soda Ash (MT)	Synthetic Soda Ash (MT)
2005	0	0.7
2007	0.4	2.2
2008	3.2	2.2

Which of the following statements are true?
1. Proportion of natural soda ash to synthetic soda ash has decreased from 2001 to 2006 globally.
2. Proportion of natural soda ash to synthetic soda ash has increased from 2001 to 2006 globally.
3. Proportion of synthetic soda ash to total soda ash has decreased for Tata Chemicals from 2005 to 2007.
4. Proportion of synthetic soda ash to total ash has increased for Tata Chemicals.

(A) 1 and 3
(B) 1 and 4
(C) 2 and 4
(D) 2 and 3

Correct Answer: (A) 1 and 3

SOLUTION:

This question bundles two separate true or false checks: a world level trend (statements 1 and 2) and a Tata specific trend (statements 3 and 4).

1. **Statement 1 (world natural to synthetic ratio fell, 2001 to 2006)**: the synthetic bars rise every year in the world chart while the natural bars barely move, so natural's share relative to synthetic keeps shrinking. This is true.
2. **Statement 2 (world ratio rose)**: this is the opposite of what the chart shows, so it is false.
3. **Statement 3 (Tata's synthetic share of its own output fell, 2005 to 2007)**: Tata made no natural soda ash in 2005, so its synthetic share that year was $0.7/0.7 = 100$ percent. By 2007, with 0.4 MT natural added, synthetic's share dropped to $2.2/2.6 \approx 85$ percent. Since 85 is less than 100, the share fell. This is true.
4. **Statement 4 (Tata's synthetic share rose)**: we just showed the share fell from 100 percent down toward 85 percent and then about 41 percent by 2008, so it cannot have risen too. This is false.

Pairing the one correct world statement (1) with the one correct Tata statement (3) gives the answer.

Let's summarize:

- World synthetic soda ash output grew steadily from 2001 to 2006 while natural output stayed flat, so natural's share fell.
- Tata's synthetic share fell from 100 percent in 2005 to about 85 percent in 2007 as its natural output came online.

So the correct combination is statements 1 and 3, which is option A.

Quick Tip: Look at which bar is climbing and which is flat in each chart: a ratio falls whenever its denominator grows faster than its numerator.

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71. Continuing from the soda ash data: Tata Chemicals' own natural and synthetic soda ash output was:

Year	Natural Soda Ash (MT)	Synthetic Soda Ash (MT)
2005	0	0.7
2007	0.4	2.2
2008	3.2	2.2

The world production chart, however, only plots totals for the years 2001 to 2006.

What is Tata Chemicals' share of global production in 2008?

(A) 12.86%

(B) 17.42%

(C) 59.34%

(D) Incomplete data.

Correct Answer: (D) Incomplete data.

SOLUTION:

Work out what is actually needed before reaching for a calculator. Tata's share of global production in 2008 needs two numbers: Tata's own 2008 output, and the world's total 2008 output.

1. **12.86%**: this figure can only be produced by assuming some particular world total for 2008 and dividing 5.4 MT by it, but no such world total is given anywhere in the charts, so this is not a supportable answer.
2. **17.42%**: same problem, this also needs an assumed world 2008 total that the data does not provide.
3. **59.34%**: this would mean Tata made up well over half the world's soda ash, again only reachable by guessing a world total, not by reading it off the charts.
4. **Incomplete data**: the world production chart plots only 2001 to 2006. There is no 2008 bar on it at all, so the denominator we need simply does not exist in the given information.

Since only Tata's own 2008 figure (5.4 MT) is available and the world's 2008 total is never shown, the share cannot be computed.

Let's summarize:

- Tata's 2008 output is known from its own chart: 3.2 MT natural plus 2.2 MT synthetic, or 5.4 MT.
- The world chart never reports a 2008 figure, so there is nothing to divide that 5.4 MT by.

So the correct answer is that the data is incomplete.

Quick Tip: Check the world production chart's years before dividing: it stops at 2006, so there is no global total for 2008 to divide Tata's output by.

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72. Tata Chemicals' own natural and synthetic soda ash output was:

Year	Natural Soda Ash (MT)	Synthetic Soda Ash (MT)
2005	0	0.7
2007	0.4	2.2
2008	3.2	2.2

Suppose total global production of soda ash in 2008 was 40 MT, and Tata Chemicals was the second highest producer of soda ash globally, right after another company called Solvay. FMC Wyoming was the third highest producer. The two Indian giants, Tata Chemicals and Nirma, had a combined soda ash production capacity of 8.8 MT.

Which of the following statements are right?
1. Solvay's market share was more than 20.66%
2. Solvay's market share was more than 13.5%
3. FMC's share was less than 10.33%
4. FMC's share was less than 13.5%
5. Nirma, which was the sixth largest producer, had a share of less than 8.5%
Choose the right option.

(A) 1 and 3

(B) 1 and 5

(C) 2 and 4

(D) 1, 3 and 5

Correct Answer: (C) 2 and 4

SOLUTION:

The key move here is to pin down one exact number, Tata's own 2008 share, and then use the ranking and the capacity figure to bound everyone else against it, rather than trying to compute exact shares for companies whose output is never actually given.

1. **Tata's own share**: Tata's 2008 output is 3.2 MT natural plus 2.2 MT synthetic, or 5.4 MT. Out of a 40 MT world total, that is **5.4/40 = 13.5** percent exactly.
2. **Statements 1 and 2 (Solvay)**: Solvay outranks Tata, so Solvay's share exceeds 13.5 percent. That is enough to call statement 2 true. It is not enough to call statement 1 true, since crossing 13.5 percent does not mean crossing the much higher bar of 20.66 percent.
3. **Statements 3 and 4 (FMC)**: FMC ranks below Tata, so FMC's share is under 13.5 percent, confirming statement 4. But being under 13.5 percent does not mean being under the stricter 10.33 percent in statement 3, so statement 3 stays unconfirmed.
4. **Statement 5 (Nirma)**: the 8.8 MT figure is a combined production capacity for Tata and Nirma, not their combined actual output. Subtracting Tata's actual 5.4 MT leaves at most 3.4 MT of capacity for Nirma, which is at most 8.5 percent of 40 MT. Since this is a ceiling exactly equal to 8.5 percent rather than a number strictly below it, the claim of less than 8.5 percent cannot be treated as proven.

Only the two claims tied directly to Tata's exact 13.5 percent benchmark, statements 2 and 4, survive scrutiny.

Let's summarize:

- Tata's 2008 share works out to exactly 13.5 percent of the 40 MT total.
- Solvay must beat 13.5 percent and FMC must fall short of it, but neither is pinned to the stricter 20.66 percent or 10.33 percent bars.
- Nirma's capacity only bounds its share at 8.5 percent, it does not prove the share is strictly below that.

So the right combination is statements 2 and 4, option C.

Quick Tip: Work out Tata's own 2008 share first (5.4 MT of 40 MT, which is 13.5 percent), then use Solvay greater than Tata greater than FMC to bound the other two shares, and treat the Tata plus Nirma capacity figure as a ceiling, not an exact output number.

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73. Raj Travels has the following revenue model for a group package. The owner charges Rs. 20,000 per person for a group size up to 200. For every additional traveller beyond 200, he starts offering a discount of Rs. 50 to ALL members of the group.

The maximum possible income for Raj Travels from the package is:

(A) Rs. 4000000

(B) Rs. 4200000

(C) Rs. 4500000

(D) Rs. 5000000

Correct Answer: (C) Rs. 4500000

SOLUTION:

Step 1: Understanding the Concept:
Revenue here is a quadratic function of the number of extra travellers, and a quadratic with a negative leading coefficient always has a single highest point. We can find that highest point directly by completing the square instead of using the vertex formula.

Step 2: Key Formula or Approach:
Let k be the number of travellers past 200. Group size is $200 + k$, price per person is $20000 - 50k$, so revenue is $R(k) = (200 + k)(20000 - 50k)$, which expands to $R(k) = -50k^2 + 10000k + 4{,}000{,}000$.

Step 3: Detailed Explanation:
Factor out -50 from the k terms:
$R(k) = -50(k^2 - 200k) + 4{,}000{,}000$
Complete the square inside the bracket: $k^2 - 200k = (k - 100)^2 - 10000$. Substituting back:
$R(k) = -50[(k - 100)^2 - 10000] + 4{,}000{,}000$
$R(k) = -50(k - 100)^2 + 500{,}000 + 4{,}000{,}000$
$R(k) = 4{,}500{,}000 - 50(k - 100)^2$
Since $(k - 100)^2$ is a square, it is never negative, so the term $-50(k - 100)^2$ is never positive. This means $R(k)$ can never exceed $4{,}500{,}000$, and it hits that value exactly when $k = 100$, meaning a group of 300 people paying Rs. 15,000 each.

Step 4: Final Answer:
The maximum possible revenue Raj Travels can earn from this package is Rs. 45,00,000.

$$\boxed{Rs. 45,00,000}$$

Quick Tip: Write revenue as a quadratic function of the number of extra travellers beyond 200, then find where that quadratic peaks.

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74. Four married couples competed in a singing competition. Each couple had a unique team name. Points scored by the teams were 2, 4, 6 and 8. The 'Sweet Couple' won 2 points. The 'Bindas Singers' won two more points than Laxman's team. Mukesh's team won four points more than Lina's team, but Lina's team didn't score the least amount of points. 'Just Singing' won 6 points. Waheda wasn't on the team called 'New Singers'. Sanjeev's team won 4 points. Divya wasn't on the 'Bindas Singers' team. Tapas and Sania were on the same team, but it wasn't the 'Sweet Couple'.

Laxman's teammate and team's name were:

(A) Divya and Sweet Couple

(B) Divya and Just Singing

(C) Waheda and Bindas Singers

(D) Waheda and Sweet Couple

Correct Answer: (D) Waheda and Sweet Couple

SOLUTION:

A cleaner way through this puzzle is to build the full team by score, from lowest to highest, checking every clue as each slot is filled.

1. **2 points, Sweet Couple**: given directly by name.
2. **6 points, Just Singing**: also given directly by name.
3. **Bindas Singers and New Singers**: these hold 4 and 8 in some order. Sanjeev's team scores 4, and testing shows Sanjeev must be on Bindas Singers: if Bindas Singers held 8 instead, Laxman's team (two less than Bindas Singers) would have to be Just Singing, Sanjeev would land on New Singers, and the leftover Sweet Couple slot would force Tapas onto it, breaking the clue that Tapas and Sania were not on Sweet Couple. So Bindas Singers = 4 and New Singers = 8.
4. **Laxman's team**: two less than Bindas Singers' 4 points, so Laxman's team scores 2, meaning Laxman is on Sweet Couple.
5. **Lina and Mukesh**: Mukesh's team scores four more than Lina's, and Lina's team is not the lowest scorer. The only pair fitting the remaining scores is Lina = 4 (Bindas Singers, with Sanjeev) and Mukesh = 8 (New Singers).
6. **Tapas and Sania**: the only team left for Tapas is Just Singing (6 points), which is not Sweet Couple, matching the clue directly, so Sania joins him there.
7. **Divya and Waheda**: only Laxman (Sweet Couple) and Mukesh (New Singers) still need partners. Since Waheda cannot be on New Singers, she must partner Laxman, leaving Divya to partner Mukesh.

This rebuilds the same final table: Sweet Couple is Laxman and Waheda, Bindas Singers is Sanjeev and Lina, Just Singing is Tapas and Sania, New Singers is Mukesh and Divya.

Let's summarize:

- The two named scores (Sweet Couple = 2, Just Singing = 6) anchor the whole puzzle.
- Testing both ways to split 4 and 8 between Bindas Singers and New Singers quickly eliminates one branch using the Tapas and Sania clue.

So Laxman's teammate is Waheda, on the Sweet Couple team.

Quick Tip: Pin down the two named scores first (Sweet Couple = 2, Just Singing = 6), then test how the remaining scores 4 and 8 can split between Bindas Singers and New Singers using the Laxman and Lina clues.

75. Four married couples competed in a singing competition. Each couple had a unique team name. Points scored by the teams were 2, 4, 6 and 8. The 'Sweet Couple' won 2 points. The 'Bindas Singers' won two more points than Laxman's team. Mukesh's team won four points more than Lina's team, but Lina's team didn't score the least amount of points. 'Just Singing' won 6 points. Waheda wasn't on the team called 'New Singers'. Sanjeev's team won 4 points. Divya wasn't on the 'Bindas Singers' team. Tapas and Sania were on the same team, but it wasn't the 'Sweet Couple'.

The teams arranged in the ascending order of points are:

(A) Bindas Singers, Just Singing, New Singers, Sweet Couple

(B) Sweet Couple, New Singers, Just Singing, Bindas Singers

(C) New Singers, Sweet Couple, Bindas Singers, Just Singing

(D) Sweet Couple, Bindas Singers, Just Singing, New Singers

Correct Answer: (D) Sweet Couple, Bindas Singers, Just Singing, New Singers

SOLUTION:

Rather than solving for every person, this question only needs the four team scores, so we can stop as soon as those are fixed.

1. **Two scores are free**: Sweet Couple = 2 and Just Singing = 6 come straight from the clues that name them.
2. **The other two scores need a branch test**: Bindas Singers and New Singers share 4 and 8. If Bindas Singers were 8, Laxman's team (two less) would be Just Singing, Sanjeev (score 4) would land on New Singers, and the only leftover team, Sweet Couple, would have to go to Tapas, contradicting the rule that Tapas and Sania were not on Sweet Couple.
3. **So Bindas Singers = 4 and New Singers = 8**: this makes Laxman's team score 2 (Sweet Couple) and lets Sanjeev, who scores 4, sit on Bindas Singers, with nothing left to contradict.
4. **Cross-check with Mukesh and Lina**: their scores must differ by four with Lina not lowest, which only works as Lina = 4, Mukesh = 8, again matching Bindas Singers = 4 and New Singers = 8.

So the four scores stand at Sweet Couple 2, Bindas Singers 4, Just Singing 6, New Singers 8.

Let's summarize:

- Two scores are handed to us directly by team name.
- The Tapas and Sania clue is what breaks the tie between the two ways of splitting 4 and 8.

Arranged from lowest to highest: Sweet Couple, Bindas Singers, Just Singing, New Singers.

Quick Tip: Fix the two named scores first (Sweet Couple = 2, Just Singing = 6), then use the Tapas and Sania clue to rule out one of the two ways to split 4 and 8 between Bindas Singers and New Singers.

76. Four married couples competed in a singing competition. Each couple had a unique team name. Points scored by the teams were 2, 4, 6 and 8. The 'Sweet Couple' won 2 points. The 'Bindas Singers' won two more points than Laxman's team. Mukesh's team won four points more than Lina's team, but Lina's team didn't score the least amount of points. 'Just Singing' won 6 points. Waheda wasn't on the team called 'New Singers'. Sanjeev's team won 4 points. Divya wasn't on the 'Bindas Singers' team. Tapas and Sania were on the same team, but it wasn't the 'Sweet Couple'.

The combination which has the couples rightly paired is:

(A) Mukesh, Lina

(B) Mukesh, Waheda

(C) Sanjeev, Divya

(D) Sanjeev, Lina

Correct Answer: (D) Sanjeev, Lina

SOLUTION:

Instead of re-deriving the whole table, this question can be answered by testing each option against the strongest available clue, the four-point gap between Mukesh's team and Lina's team.

1. **Mukesh, Lina**: if Mukesh and Lina were a couple, they would be on the same team, so their team scores would be equal, not four apart. This contradicts the clue directly, so this option is wrong.
2. **Mukesh, Waheda**: Waheda is ruled out as Mukesh's partner separately, since Waheda cannot be on New Singers, and Mukesh's team (once the scores are worked out) is New Singers. So this is wrong too.
3. **Sanjeev, Divya**: Sanjeev's team scores 4 points, which turns out to be Bindas Singers, and Divya is explicitly excluded from Bindas Singers by one of the clues, so Divya cannot be Sanjeev's partner.
4. **Sanjeev, Lina**: working out the scores shows Bindas Singers = 4 points, matching Sanjeev directly, and separately Lina's team (four less than Mukesh's team of 8) also comes out to 4 points. Since both point to the same 4 point team, Sanjeev and Lina must be the couple sharing it.

So elimination across all four options leaves only one couple standing.

Let's summarize:

- Mukesh cannot be paired with Lina, since that would erase the four-point gap between their teams.
- Waheda is separately fixed away from Mukesh's team (New Singers), and Divya is separately fixed away from Sanjeev's team (Bindas Singers).
- That leaves Sanjeev and Lina as the only couple that fits every clue.

Thus the correctly paired couple is Sanjeev and Lina.

Quick Tip: Work out the full team-score table first, then use the clue that Lina's team scored four less than Mukesh's team to see which man Lina actually sits with.

77.

The regular mathematics faculty could not teach because of being sick. As a stop-gap arrangement, different visiting faculty taught different topics on 4 different days in a week. The scheduled time for class was 7:00 am, with a maximum permissible delay of 20 minutes. The monsoon made the city bus schedules erratic, so the classes started at different times on different days.

Mr. Singh did not teach on Thursday. Calculus was taught in the class that started at 7:20 am. Mr. Chatterjee took the class on Wednesday, but he did not teach probability. The class on Monday started at 7:00 am, but Mr. Singh did not teach it. Mr. Dutta did not teach ratio and proportion. Mr. Banerjee, who did not teach set theory, taught a class that started five minutes later than the class in which probability was taught. The teacher in Friday's class taught set theory. Wednesday's class did not start at 7:10 am. No two classes started at the same time.

77. The class on Wednesday started at:

(A) 7:05 am and the topic was ratio and proportion.

(B) 7:20 am and the topic was calculus.

(C) 7:00 am and the topic was calculus.

(D) 7:20 am and the topic was calculus.

Correct Answer: (B) 7:20 am and the topic was calculus.

SOLUTION:

This is a 4-day, 4-teacher, 4-topic, 4-timing puzzle. Instead of building the schedule from scratch, this method checks each of the four listed timings against the clues directly and eliminates the ones that break a rule.

- Mr. Singh must teach on Friday: he does not teach Monday or Thursday, and Wednesday belongs to Mr. Chatterjee, so Friday is the only day left for him, and Friday's topic is set theory.
- Mr. Dutta must teach probability on Monday at 7:00 am: Mr. Chatterjee, Mr. Singh and Mr. Banerjee are all ruled out of teaching probability (Chatterjee by direct statement, Singh because he has set theory, Banerjee because his class starts five minutes after the probability class), leaving only Dutta; putting him on Thursday would force the probability class to start at 6:55 am, which breaks the 7:00 to 7:20 am window, so he must be on Monday.
- Mr. Banerjee then teaches Thursday at 7:00 am + 5 minutes = 7:05 am, and since calculus starts at 7:20 am while Banerjee's class starts at 7:05 am, Banerjee's topic must be ratio and proportion, not calculus.

By elimination, the only slot left is Mr. Chatterjee's Wednesday class, and the only topic left is calculus, so it must start at 7:20 am, matching the requirement that calculus starts at 7:20 am, and not clashing with the rule that Wednesday did not start at 7:10 am.

1. **7:05 am, ratio and proportion**: wrong topic and wrong time for Wednesday, since Wednesday's topic is calculus.
2. **7:20 am, calculus**: matches every clue worked out above.
3. **7:00 am, calculus**: 7:00 am is already taken by Monday's class, and no two classes share a start time, so this is impossible.
4. **7:20 am, calculus**: identical in content to the option above; this repeated option is exactly why the question could not be scored with one unique correct choice and was officially withdrawn.

Let's summarize:

- Monday, Wednesday, Thursday and Friday are the four visiting-faculty days, taken by Dutta, Chatterjee, Banerjee and Singh respectively.
- The topics in that same order are probability, calculus, ratio and proportion, and set theory.

So the Wednesday class started at 7:20 am with calculus as the topic, even though the paper's own duplicated option made this question a dropped one.

Quick Tip: Fix Mr. Singh to Friday (set theory) and Mr. Chatterjee to Wednesday first, then use the five-minutes-after-the-probability-class clue to place Mr. Dutta on Monday and Mr. Banerjee on Thursday.

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78.

The regular mathematics faculty could not teach because of being sick. As a stop-gap arrangement, different visiting faculty taught different topics on 4 different days in a week. The scheduled time for class was 7:00 am, with a maximum permissible delay of 20 minutes. The monsoon made the city bus schedules erratic, so the classes started at different times on different days.

Mr. Singh did not teach on Thursday. Calculus was taught in the class that started at 7:20 am. Mr. Chatterjee took the class on Wednesday, but he did not teach probability. The class on Monday started at 7:00 am, but Mr. Singh did not teach it. Mr. Dutta did not teach ratio and proportion. Mr. Banerjee, who did not teach set theory, taught a class that started five minutes later than the class in which probability was taught. The teacher in Friday's class taught set theory. Wednesday's class did not start at 7:10 am. No two classes started at the same time.

78. The option which gives the correct teacher-subject combination is:

(A) Mr. Chatterjee - ratio and proportion

(B) Mr. Banerjee - calculus

(C) Mr. Chatterjee - set theory

(D) Mr. Singh - set theory

Correct Answer: (D) Mr. Singh - set theory

SOLUTION:

Instead of deriving the whole week fresh, this method walks through the four given teacher-topic pairs one at a time and tests each against the clues.

1. **Mr. Chatterjee - ratio and proportion**: Mr. Chatterjee's only stated day is Wednesday, and once Mr. Dutta is fixed to probability and Mr. Singh to set theory (from the Friday clue), the calculus-at-7:20-am clue can only be satisfied by Mr. Chatterjee, because Mr. Banerjee's class works out to 7:05 am. So Mr. Chatterjee taught calculus, not ratio and proportion. This option is wrong.
2. **Mr. Banerjee - calculus**: Mr. Banerjee's start time is always five minutes after the probability class. Since the probability class (Mr. Dutta, Monday) starts at 7:00 am, Mr. Banerjee's class starts at 7:05 am, not 7:20 am, so he cannot be the calculus teacher. This option is wrong.
3. **Mr. Chatterjee - set theory**: Friday's teacher taught set theory, and Mr. Chatterjee teaches on Wednesday, not Friday, so set theory is not his topic. This option is wrong.
4. **Mr. Singh - set theory**: Mr. Singh cannot teach Monday or Thursday, and Wednesday belongs to Mr. Chatterjee, so he is on Friday, and Friday's teacher taught set theory. This option matches every clue.

The correct combination is Mr. Singh, set theory, because he is the only teacher whose day (Friday) is directly tied to the set theory topic by the puzzle's own wording.

Let's summarize:

- Working out each teacher's day first (Chatterjee-Wednesday, Singh-Friday, Dutta-Monday, Banerjee-Thursday) pins down every topic through the calculus-timing and set-theory-on-Friday clues.
- Three of the four listed pairs break a stated clue; only Mr. Singh with set theory survives all of them.

So the teacher-subject combination that is actually correct is Mr. Singh - set theory.

Quick Tip: Work out which day Mr. Singh teaches first (it has to be Friday), then use the clue that Friday's teacher taught set theory to fix his subject directly.

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79.

The regular mathematics faculty could not teach because of being sick. As a stop-gap arrangement, different visiting faculty taught different topics on 4 different days in a week. The scheduled time for class was 7:00 am, with a maximum permissible delay of 20 minutes. The monsoon made the city bus schedules erratic, so the classes started at different times on different days.

Mr. Singh did not teach on Thursday. Calculus was taught in the class that started at 7:20 am. Mr. Chatterjee took the class on Wednesday, but he did not teach probability. The class on Monday started at 7:00 am, but Mr. Singh did not teach it. Mr. Dutta did not teach ratio and proportion. Mr. Banerjee, who did not teach set theory, taught a class that started five minutes later than the class in which probability was taught. The teacher in Friday's class taught set theory. Wednesday's class did not start at 7:10 am. No two classes started at the same time.

79. Probability was taught by:

(A) Mr. Dutta on Monday

(B) Mr. Dutta on Thursday

(C) Mr. Singh on Wednesday

(D) Mr. Singh on Monday

Correct Answer: (A) Mr. Dutta on Monday

SOLUTION:

Check the four listed teacher-day pairs against the fixed facts about set theory (Friday) and the five-minute gap rule, instead of deriving the whole grid first.

1. **Mr. Dutta on Monday**: Chatterjee, Singh and Banerjee are all ruled out of probability (Chatterjee by direct statement, Singh because Friday's teacher has set theory, Banerjee because he cannot be five minutes after his own class), which leaves Dutta as the probability teacher; putting Dutta on Thursday instead of Monday would force a class five minutes earlier than his to start before 7:00 am, which is not allowed, so Monday is correct.
2. **Mr. Dutta on Thursday**: this would push the probability class before the allowed 7:00 to 7:20 am window; Monday is the only day that works for Dutta.
3. **Mr. Singh on Wednesday**: Wednesday belongs to Mr. Chatterjee, not Mr. Singh, by direct statement, so this pairing is impossible on the day alone.

4. **Mr. Singh on Monday**: the clue states plainly that Mr. Singh did not teach the Monday class, so this is ruled out immediately, and separately Mr. Singh's real day, Friday, carries set theory, not probability.

Only the first option survives every check.

Let's summarize:

- Three of the five teachers (Chatterjee, Singh, Banerjee) are excluded from probability by direct or derived clues, leaving Dutta.
- The 7:00 am Monday start and the five-minutes-later rule for Banerjee's Thursday class only fit together if Dutta, not Banerjee, is on Monday.

So probability was taught by Mr. Dutta, on Monday.

Quick Tip: Eliminate Chatterjee, Singh and Banerjee from probability using the direct clues, then use the Monday 7:00 am start to fix Dutta's day.

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80.

The regular mathematics faculty could not teach because of being sick. As a stop-gap arrangement, different visiting faculty taught different topics on 4 different days in a week. The scheduled time for class was 7:00 am, with a maximum permissible delay of 20 minutes. The monsoon made the city bus schedules erratic, so the classes started at different times on different days.

Mr. Singh did not teach on Thursday. Calculus was taught in the class that started at 7:20 am. Mr. Chatterjee took the class on Wednesday, but he did not teach probability. The class on Monday started at 7:00 am, but Mr. Singh did not teach it. Mr. Dutta did not teach ratio and proportion. Mr. Banerjee, who did not teach set theory, taught a class that started five minutes later than the class in which probability was taught. The teacher in Friday's class taught set theory. Wednesday's class did not start at 7:10 am. No two classes started at the same time.

80. The option which gives a possible correct class time - week day combination is:

(A) Wednesday - 7:10 am, Thursday - 7:20 am, Friday - 7:05 am

(B) Wednesday - 7:20 am, Thursday - 7:15 am, Friday - 7:20 am

(C) Wednesday - 7:05 am, Thursday - 7:20 am, Friday - 7:10 am

(D) Wednesday - 7:20 am, Thursday - 7:05 am, Friday - 7:10 am

Correct Answer: (D) Wednesday - 7:20 am, Thursday - 7:05 am, Friday - 7:10 am

SOLUTION:

Since two of the three days asked about (Wednesday and Thursday) have times that are fully forced by the clues, the fastest check is to test each option's Wednesday and Thursday entries first, before even looking at Friday.

1. **Wednesday 7:10, Thursday 7:20, Friday 7:05**: Wednesday must be 7:20 am (Chatterjee's calculus class), not 7:10 am, so this fails immediately; it also clashes with the separate clue that Wednesday's class did not start at 7:10 am.
2. **Wednesday 7:20, Thursday 7:15, Friday 7:20**: Wednesday is right at 7:20 am, but Thursday should be 7:05 am (Banerjee, five minutes after Dutta's 7:00 am probability class), not 7:15 am; also, Friday cannot repeat Wednesday's 7:20 am, since no two classes share a start time.

3. **Wednesday 7:05, Thursday 7:20, Friday 7:10**: Wednesday should be 7:20 am, not 7:05 am, and Thursday should be 7:05 am, not 7:20 am, so both the given Wednesday and Thursday values are swapped incorrectly.
4. **Wednesday 7:20, Thursday 7:05, Friday 7:10**: Wednesday matches the calculus-at-7:20 clue, Thursday matches Banerjee's 7:00 + 5 = 7:05 am, and Friday at 7:10 am is one of the open values left for Mr. Singh once Monday (7:00), Wednesday (7:20) and Thursday (7:05) are used up. Nothing here repeats a used time.

Only the last combination survives, so it is the one that is genuinely possible.

Let's summarize:

- Wednesday's time is fixed at 7:20 am by the calculus clue, and Thursday's time is fixed at 7:05 am by the five-minutes-after-probability clue; both are non-negotiable.
- Friday's time is flexible, so the question only needs one workable value there, and 7:10 am does not clash with any of the other three fixed times.

So Wednesday 7:20 am, Thursday 7:05 am, Friday 7:10 am is the possible correct combination.

Quick Tip: Wednesday and Thursday are fully fixed by the calculus and five-minutes-after-probability clues; only Friday has some room, so match those two fixed values first.

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81.

Five people joined different engineering colleges. Their first names were Sarah (Ms.), Swati (Ms.), Jackie, Mohan and Priya (Ms.). The surnames were Reddy, Gupta, Sanyal, Kumar and Chatterjee. Except for one college which was rated as 3 star, all other colleges were rated either 4 star or 5 star.

The 'Techno Institute' had a higher rating than the college where Priya studied. The three-star college was not 'Deccan College.' Mohan's last name was Gupta, but he did not study at 'Barla College.' Sarah, whose last name was not Sanyal, joined 'Techno Institute.' Ms. Kumar and Jackie both studied at four-star colleges. Ms. Reddy studied at the 'Anipal Institute,' which was not a five-star college. The 'Barla College' was a five-star college. Swati's last name was not Chatterjee. The 'Chemical College' was rated one star less than the college where Sanyal studied. Only one college was rated five star.

81. Which is the correct combination of first names and surnames?

(A) Mohan Gupta, Sarah Kumar, Priya Chatterjee

(B) Priya Chatterjee, Sarah Sanyal, Jackie Kumar

(C) Jackie Sanyal, Swati Reddy, Mohan Gupta

(D) Jackie Chatterjee, Priya Reddy, Swati Sanyal

Correct Answer: (D) Jackie Chatterjee, Priya Reddy, Swati Sanyal

SOLUTION:

This method starts from the two only-one facts, one five-star college and one three-star college, and lets the ratings pin down the surnames instead of deriving names first.

1. **Mohan Gupta, Sarah Kumar, Priya Chatterjee**: Mohan Gupta is correct, and Sarah Kumar turns out correct too, but Priya's real surname is Reddy, since she studies at Anipal Institute, which the clue directly

gives to Ms. Reddy, not Chatterjee, so this option fails on its third pairing.

2. **Priya Chatterjee, Sarah Sanyal, Jackie Kumar**: Sarah's surname cannot be Sanyal, since the clue states plainly that Sarah's last name was not Sanyal; this option fails right away.
3. **Jackie Sanyal, Swati Reddy, Mohan Gupta**: Jackie must study at a four-star college (given), but the Sanyal surname belongs to whoever is at Barla College, which is five star, so Jackie cannot be Sanyal; this option fails.
4. **Jackie Chatterjee, Priya Reddy, Swati Sanyal**: Priya Reddy fits, because Priya's college is the three-star one (from the Techno-versus-Priya rating clue), and Ms. Reddy is given directly as the Anipal student, whose college is not five star, so the three-star college is Anipal, making Priya equal to Reddy. Swati Sanyal fits, because once Sarah and Priya's surnames are fixed (not Sanyal, and Reddy), and Jackie is ruled out of the five-star Barla college by the four-star clue, Swati is the only person left who can be Sanyal at Barla. Jackie Chatterjee fits by elimination, since Kumar must go to a female first name other than Swati or Priya, leaving Sarah as Kumar and Jackie as Chatterjee.

All three pairings in the last option check out.

Let's summarize:

- The unique five-star college (Barla) and unique three-star college (whichever is not Deccan) are the anchor facts that fix Swati at Barla and Priya at the three-star college.
- Ms. Kumar being female then forces Kumar onto Sarah rather than Jackie, since Jackie is not a Ms. in the puzzle.

So the correct combination of first names and surnames is Jackie Chatterjee, Priya Reddy, Swati Sanyal.

Quick Tip: Barla is the only five-star college, and Techno being higher-rated than Priya's college forces Priya onto the unique three-star college; work the surnames out from there.

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82.

Five people joined different engineering colleges. Their first names were Sarah (Ms.), Swati (Ms.), Jackie, Mohan and Priya (Ms.). The surnames were Reddy, Gupta, Sanyal, Kumar and Chatterjee. Except for one college which was rated as 3 star, all other colleges were rated either 4 star or 5 star.

The 'Techno Institute' had a higher rating than the college where Priya studied. The three-star college was not 'Deccan College.' Mohan's last name was Gupta, but he did not study at 'Barla College.' Sarah, whose last name was not Sanyal, joined 'Techno Institute.' Ms. Kumar and Jackie both studied at four-star colleges. Ms. Reddy studied at the 'Anipal Institute,' which was not a five-star college. The 'Barla College' was a five-star college. Swati's last name was not Chatterjee. The 'Chemical College' was rated one star less than the college where Sanyal studied. Only one college was rated five star.

82. Which option gives a possible student - institute combination?

(A) Priya - Anipal, Swati - Deccan, Mohan - Chemical

(B) Swati - Barla, Priya - Anipal, Jackie - Deccan

(C) Joydeep - Chemical, Priya - Techno, Mohan - Barla

(D) Priya - Anipal, Joydeep - Techno, Sarah - Barla

Correct Answer: (B) Swati - Barla, Priya - Anipal, Jackie - Deccan

SOLUTION:

Rather than re-deriving the full table, this check takes each option's three named pairings and tests them one by one against the two facts that are fixed for certain: Sarah is at Techno, and Barla is the one five-star college that cannot go to Mohan or Jackie.

1. **Priya - Anipal, Swati - Deccan, Mohan - Chemical**: Priya - Anipal is right, but Swati has to be at Barla, the only person left once Sarah/Techno, Mohan-not-Barla and Jackie-needs-four-star are all applied, not Deccan, so this option fails on its second pairing.
2. **Swati - Barla, Priya - Anipal, Jackie - Deccan**: Swati - Barla holds because she is the only remaining candidate for the unique five-star college. Priya - Anipal holds because Priya's college is the unique three-star one, and Ms. Reddy, a non-five-star Anipal student, is Priya once surnames are traced through. Jackie - Deccan holds because Jackie only needs a four-star college, and Deccan (four star) is one of the two colleges left once Techno, Barla and Anipal are assigned to Sarah, Swati and Priya.
3. **Joydeep - Chemical, Priya - Techno, Mohan - Barla**: Joydeep is not one of the five people named in the puzzle (Sarah, Swati, Jackie, Mohan, Priya), so this option is invalid on its face; it also wrongly gives Techno to Priya, which is Sarah's college, and Barla to Mohan, who is explicitly kept off Barla.
4. **Priya - Anipal, Joydeep - Techno, Sarah - Barla**: again brings in the non-existent Joydeep, and separately moves Sarah to Barla when Sarah is fixed at Techno by direct statement.

Only the second option has all three pairings hold up.

Let's summarize:

- Sarah - Techno and Barla being reserved for Swati, the only person not excluded from the five-star college, are the two anchor facts.
- Two of the four options invent a person, Joydeep, who does not exist among the five people in the puzzle, which is an easy way to spot they are wrong.

So the possible student-institute combination is Swati - Barla, Priya - Anipal, Jackie - Deccan.

Quick Tip: Barla can only go to Swati once Sarah (Techno), Mohan and Jackie are ruled out of it, and Priya sits at the unique three-star college, which is Anipal.

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83.

Five people joined different engineering colleges. Their first names were Sarah (Ms.), Swati (Ms.), Jackie, Mohan and Priya (Ms.). The surnames were Reddy, Gupta, Sanyal, Kumar and Chatterjee. Except for one college which was rated as 3 star, all other colleges were rated either 4 star or 5 star.

The 'Techno Institute' had a higher rating than the college where Priya studied. The three-star college was not 'Deccan College.' Mohan's last name was Gupta, but he did not study at 'Barla College.' Sarah, whose last name was not Sanyal, joined 'Techno Institute.' Ms. Kumar and Jackie both studied at four-star colleges. Ms. Reddy studied at the 'Anipal Institute,' which was not a five-star college. The 'Barla College' was a five-star college. Swati's last name was not Chatterjee. The 'Chemical College' was rated one star less than the college where Sanyal studied. Only one college was rated five star.

83. Mohan Gupta may have joined:

(A) Techno Institute which had 5 star rating

(B) Deccan College which had 5 star rating

(C) Anipal Institute which had 4 star rating

(D) Chemical College which had 4 star rating

Correct Answer: (D) Chemical College which had 4 star rating

SOLUTION:

This check goes through the five options directly, using only the ratings and the placements that are already fixed for the other four people.

1. **Techno Institute, 5 star rating**: wrong on both counts. Techno is Sarah's college by direct statement, not Mohan's, and Techno is four star, not five star, since Barla is the only five-star college.
2. **Deccan College, 5 star rating**: wrong on the rating; Deccan is one of the three four-star colleges (Techno, Deccan, Chemical), since Barla alone is five star.
3. **Anipal Institute, 4 star rating**: wrong on the college. Anipal belongs to Priya, who is Ms. Reddy, and it is actually the three-star college, not four star.
4. **Chemical College, 4 star rating**: Mohan is ruled out of Barla (direct clue), Techno (Sarah's) and Anipal (Priya's, as Ms. Reddy), leaving only Deccan and Chemical; tracing the surnames through, Swati-Sanyal-Barla, Sarah-Kumar-Techno, Priya-Reddy-Anipal, Jackie-Chatterjee, Mohan-Gupta, places Jackie at Deccan and Mohan at Chemical, and Chemical, like Techno and Deccan, is four star since only Barla is five star and only Anipal is three star.
5. **Techno Institute, 4 star rating**: the rating, four star, is correct for Techno, but Techno is Sarah's college, not Mohan's, so this pairing is still wrong for Mohan.

Only Chemical College at four star fits Mohan.

Let's summarize:

- Mohan is excluded from Barla, Techno and Anipal by direct or derived clues, leaving Deccan and Chemical.
- Since only Barla is five star and only Anipal is three star, both Deccan and Chemical are four star, and the surname trail (Gupta equals Mohan) settles Chemical as his specific college.

So Mohan Gupta joined Chemical College, rated four star.

Quick Tip: Mohan is ruled out of Barla, Techno and Anipal by direct clues, and the surname trail places him at Chemical College, which is four star like Deccan and Techno.

84. Five people joined different engineering colleges. Their first names were Sarah (Ms.), Swati (Ms.), Jackie, Mohan and Priya (Ms.). The surnames were Reddy, Gupta, Sanyal, Kumar and Chatterjee. Except for one college which was rated as 3 star, all other colleges were rated either 4 star or 5 star.

The 'Techno Institute' had a higher rating than the college where Priya studied. The three-star college was not 'Deccan College.' Mohan's last name was Gupta but he didn't study at 'Barla College.' Sarah, whose last name wasn't Sanyal, joined 'Techno Institute.' Ms. Kumar and Jackie both studied at four-star colleges. Ms. Reddy studied at the 'Anipal Institute,' which wasn't a five-star college. The 'Barla College' was a five-star college. Swati's last name wasn't Chatterjee. The 'Chemical College' was rated with one star less than the college where Sanyal studied. Only one college was rated five star.

In which college did Priya study?

(A) Anipal Institute

(B) Chemical Institute

(C) Barla College

(D) Deccan College

Correct Answer: (A) Anipal Institute

SOLUTION:

Step 1: Start from the two directly named colleges.
Two clues each hand us a college outright: 'Ms. Reddy studied at the Anipal Institute' fixes Anipal as Reddy's college, and 'Sarah, whose last name wasn't Sanyal, joined Techno Institute' fixes Techno as Sarah's college.

Step 2: Work out the star ratings from the remaining clues.
Only one college is five star, and that one is Barla College. The three-star college is not Deccan, and cannot be Techno either since Techno is rated above Priya's college and so cannot be the lowest rating. That leaves Anipal or Chemical as three star. Testing Chemical as three star breaks the 'only one five-star college' rule once we apply 'Chemical is one star below Sanyal's college,' so instead Anipal is the three-star college, Chemical/Deccan/Techno are four star, and Chemical being one below Sanyal's college makes Sanyal's college the five-star Barla College.

Step 3: Locate Priya by rating, not by name.
Since Techno (four star) must beat Priya's college, and the only college below four star is Anipal (three star), Priya's college has to be Anipal Institute.

Step 4: Merge with Step 1.
Anipal was already fixed as Reddy's college in Step 1, so Priya is Priya Reddy, studying at the Anipal Institute, ruling out Chemical Institute, Barla College and Deccan College as her college.

Final Answer:
Priya studied at the Anipal Institute.

Anipal Institute

Quick Tip: Fix Barla as the only five-star college and Anipal as the three-star college first using the Chemical/Sanyal clue, then the 'Techno rated higher than Priya' clue forces Priya into the only college left below four stars.

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85. Five people joined different engineering colleges. Their first names were Sarah (Ms.), Swati (Ms.), Jackie, Mohan and Priya (Ms.). The surnames were Reddy, Gupta, Sanyal, Kumar and Chatterjee. Except for one college which was rated as 3 star, all other colleges were rated either 4 star or 5 star.

The 'Techno Institute' had a higher rating than the college where Priya studied. The three-star college was not 'Deccan College.' Mohan's last name was Gupta but he didn't study at 'Barla College.' Sarah, whose last name wasn't Sanyal, joined 'Techno Institute.' Ms. Kumar and Jackie both studied at four-star colleges. Ms. Reddy studied at the 'Anipal Institute,' which wasn't a five-star college. The 'Barla College' was a five-star college. Swati's last name wasn't Chatterjee. The 'Chemical College' was rated with one star less than the college where Sanyal studied. Only one college was rated five star.

The person with surname Sanyal was:

(A) Sarah studying in Chemical College

(B) Swati studying in Barla College

(C) Priya studying in Deccan College

(D) Jackie studying in Deccan College

Correct Answer: (B) Swati studying in Barla College

SOLUTION:

Step 1: List who is already ruled out of being Sanyal.
Mohan is explicitly Gupta. Sarah is explicitly not Sanyal. Priya's college was pinned down as Anipal Institute in the companion question, so once we show Sanyal's college is Barla (a different college), Priya is automatically out too. That leaves Swati and Jackie as the only two people who could be Sanyal.

Step 2: Work out Sanyal's college rating.
Only Barla College carries the unique five-star rating in this group. Chasing the rating clues (three star has to be Anipal, not Chemical, once we check the 'no second five-star college' condition) shows that Chemical, Deccan and Techno are four star, and Sanyal's college, sitting one star above four-star Chemical, must be the five-star college, Barla.

Step 3: Use the four-star requirement on Jackie to break the tie.
Jackie is required to be at a four-star college, but Barla (Sanyal's college from Step 2) is five star, not four star. So Jackie cannot be Sanyal, and by elimination Swati must carry the surname Sanyal, studying at Barla College.

Step 4: Reject the other three answer choices.
Sarah studies at Techno Institute, not Chemical, so option A fails. Priya studies at Anipal Institute, not Deccan, so option C fails. Jackie was shown in Step 3 to not be Sanyal at all, so option D fails on the name itself.

Final Answer:
Swati studying in Barla College.

Swati, Barla College

Quick Tip: Sanyal's college works out to be the five-star Barla College; then eliminate Mohan, Sarah and Priya by name/college, and eliminate Jackie because Jackie's college must be four star, leaving only Swati.

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86. Decisions are often 'risky' in the sense that their outcomes are not known with certainty. Presented with a choice between a risky prospect that offers a 50 percent chance to win 200(*otherwisenothing*)*andanalternativeofreceiving*100 for sure, most people prefer the sure gain over the gamble, although the two prospects have the same expected value. (Expected value is the sum of possible outcomes weighted by their probability of occurrence.) Preference for a sure outcome over a risky prospect of equal expected value is called risk averse; indeed, people tend to be risk averse when choosing between prospects with positive outcomes. The tendency towards risk aversion can be explained by the notion of diminishing sensitivity, first formalized by Daniel Bernoulli in 1738. Just as the impact of a candle is greater when it is brought into a dark room than into a room that is well lit, so, suggested Bernoulli, the utility resulting from a small increase in wealth will be inversely proportional to the amount of wealth already in one's possession. It has since been assumed that people have a subjective utility function, and that preferences should be described using expected utility instead of expected value. According to expected utility, the worth of a gamble offering a 50 percent chance to win 200(*otherwisenothing*)*is*\(0.50 $\times$ *u*(200)\), *where*\(*u*\)*isthepersonsconcaveutilityfunction.*(*Afunctionisconcaveorconvexifalinejoiningtwopointsonthecurveliesenti* 100 is more than 50 percent of the value attached to a gain of 200, *whichgivesapreferenceforthesure*100 gain and, hence, risk aversion.

Consider now a choice between losses. When asked to choose between a prospect that offers a 50 percent chance to lose 200(*otherwisenothing*)*andthealternativeoflosing*100 for sure, most people prefer to take an even chance at losing 200*ornothingoverasure*100 loss. This is because diminishing sensitivity applies to negative as well as to positive outcomes: the impact of an initial 100*lossisgreaterthanthatofthenext*100. This gives a convex function for losses and a preference for risky prospects over sure outcomes of equal expected value, called risk seeking. Except for prospects that involve very small probabilities, risk aversion is generally seen in choices involving gains, while risk seeking tends to hold in choices involving losses.

Based on the above passage, look at the decision situations faced by three persons: Babu, Babitha and Bablu.

Suppose the instant and further utility of each unit of gain is the same for Babu. Babu has decided to play as many times as possible before he dies. He expects to live for another 50 years. A game does not last more than ten seconds. Babu is confused about which theory to trust for making his decision and seeks the help of a renowned decision making consultant, Roy Associates. What should Roy Associates' advice to Babu be?

(A) Babu can decide on the basis of the Expected Value hypothesis.

(B) Babu should decide on the basis of the Expected Utility hypothesis.

(C) 'Mr. Babu, I'm redundant.'

(D) A, B and C

Correct Answer: (D) A, B and C

SOLUTION:

Step 1: Translate 'same instant and further utility' into a formula.
If every additional unit of gain feels exactly as valuable as the previous unit, Babu's utility function has constant slope, so $u(x) = kx$ for some fixed $k > 0$. There is no diminishing sensitivity here, unlike the concave/convex shapes the passage uses to explain other people's risk attitudes.

Step 2: Show Expected Value and Expected Utility never disagree for this u.
For any gamble with outcomes $x_1, x_2, \ldots$ and probabilities $p_1, p_2, \ldots$, expected utility is $\sum p_i \cdot kx_i = k \sum p_i x_i = k \cdot$ **(expected value)**. Since k is a fixed positive number, whichever option has the bigger expected value also has the bigger expected utility, always. So options A and B are both valid, simultaneously correct guidance for Babu, they are the same ranking in disguise.

Step 3: Bring the repetition count into the picture.
Babu plans to squeeze in as many ten-second games as he can across roughly 50 years, which works out to a huge number of independent repetitions. The law of large numbers says that over that many repetitions, the average result he actually experiences will settle very close to the expected value of a single play, no matter which theoretical lens (value or utility) is used to describe the decision. In a setting like this, an expert consultant's specialised modelling does not change the practical advice at all, the simple 'always take the option with the higher expected value' rule already captures everything that matters.

Step 4: Put all three pieces together.
Because A and B coincide exactly (Step 2) and the repetition count makes the consultant's extra expertise unnecessary (Step 3), all three statements, A, B and C, hold true for Babu's specific situation, so the fullest and most accurate advice is all three together.

Final Answer:
Roy Associates should tell Babu A, B and C.

$$\boxed{\text{A, B and C}}$$

Quick Tip: A constant marginal utility means Expected Value and Expected Utility always agree for Babu, and playing millions of times means the law of large numbers already does the consultant's job for him.

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87. Decisions are often 'risky' in the sense that their outcomes are not known with certainty. Presented with a choice between a risky prospect that offers a 50 percent chance to win $200 (otherwise nothing) and an alternative of receiving $100 for sure, most people prefer the sure gain over the gamble, although the two prospects have the same expected value. Preference for a sure outcome over a risky prospect of equal expected value is called risk averse; people tend to be risk averse when choosing between prospects with positive outcomes, a pattern explained by diminishing sensitivity: the utility from a small increase in wealth falls as the wealth already held rises, so the person's utility function u is concave for gains. A convex utility function is the mirror image of this: it gives MORE weight to the extreme, spread-out outcome of a gamble than to a 'safer,' more sure-like outcome of the same expected value, and a person with such a function is called risk taking or risk seeking.

Based on the above, look at the decision situation faced by Babitha.

Babitha played a game in which she had three options, with probabilities 0.4, 0.5 and 0.8 respectively. The gains from the three outcomes are likely to be $100, $80 and $50 respectively. An expert has pointed out that Babitha is a risk taking person. According to the expected utility hypothesis, which option is Babitha most likely to favour?

(A) First

(B) Second

(C) Third

(D) Babitha would be indifferent to all three options.

Correct Answer: (A) First

SOLUTION:

Step 1: Notice the trap: check expected value first.
$0.4 \times 100 = 40$, $0.5 \times 80 = 40$, $0.8 \times 50 = 40$. Every option gives exactly $40 in expected value, so a person deciding purely on expected value would truly be indifferent between them, this is the trap the fourth option is designed to catch. But the question specifically asks us to use the expected utility hypothesis for a risk-taking person, not plain expected value.

Step 2: Translate 'risk taking' into a shape of utility function.
A risk-seeking (risk-taking) person has a convex utility curve, meaning the marginal utility of an extra dollar of gain INCREASES with the amount at stake, rather than decreasing the way it does for a risk-averse, concave utility holder. A convex curve rewards the more extreme, higher-variance outcome more than the safer one, even when both have identical expected value.

Step 3: Compare the three options on variance, not just expected value.
The first option (0.4 probability, $100 gain) has the widest gap between its 'win' and 'no win' outcomes, so it is the highest – variance, most extreme of the three. The third option (0.8 probability, $50 gain) is the closest to a near-certain small gain, so it is the lowest-variance, most 'sure-like' choice.

Step 4: Match Babitha's risk-taking profile to the ranking.
A convex utility function assigns the first (highest-variance) option the highest expected utility among the three, even though all three tie on plain expected value. Since Babitha is risk taking, she is most likely to pick the option that a convex utility function ranks highest, which is the first option, not the second, third, or a tie between all three.

Final Answer:
Babitha is most likely to favour the First option.

First

Quick Tip: All three options tie at an expected value of $40, so the tie has to be broken by Babitha's convex, risk-seeking utility function, which favours the most extreme, lowest-probability, highest-payoff option.

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88. Recall Babitha's game: three options with probabilities 0.4, 0.5 and 0.8, giving likely gains of 100,80 and 50*respectively*(*allthreehavethesameexpectedvalueof* 40, and Babitha, being risk taking, was shown to favour the first, most spread-out option when she can play repeatedly).

Continuing with the previous question, suppose Babitha can only play one more game. Which theory would help in arriving at a better decision?

(A) Expected Value

(B) Expected Utility

(C) Both theories will give the same result.

(D) Data is insufficient to answer the question.

Correct Answer: (D) Data is insufficient to answer the question.

SOLUTION:

Step 1: Separate 'which theory is right in principle' from 'which theory can we compute.'
In principle, for a single, one-off gamble, expected utility (which encodes a person's actual risk attitude through the curvature of u) is the theoretically appropriate tool, while plain expected value is meant for repeated play, where the law of large numbers smooths outcomes out over many trials. Since Babitha now has only one game left, expected value has lost its main justification.

Step 2: Check expected value anyway.
$0.4 \times 100 = 40$, $0.5 \times 80 = 40$, $0.8 \times 50 = 40$; every option ties at $40, so even if we tried to use expected value here, it gives us zero information to prefer one option over another.

Step 3: Check whether expected utility is actually usable.
Applying expected utility for real requires plugging real numbers into $u(100)$, $u(80)$ and $u(50)$, meaning we would need to know Babitha's exact utility function, not just that it is convex. The passage and the earlier question give us only the label 'risk taking,' a qualitative description of the curve's shape, with no formula or numbers attached to it.

Step 4: Combine both findings.
Expected value theoretically no longer applies well to a one-shot decision, and even if we lean on the more appropriate expected utility theory, we lack the actual utility numbers needed to compute it. With neither route giving us a computable, defensible recommendation, the only honest conclusion is that we simply do not have enough data to say which theory leads to a better decision for Babitha's last game.

Final Answer:
Data is insufficient to answer the question.

Data insufficient

Quick Tip: A single play gets no benefit from the law of large numbers, so expected value is useless here, but applying expected utility properly needs actual utility numbers, not just the qualitative fact that Babitha is risk taking.

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89. Decisions are often 'risky' in the sense that their outcomes are not known with certainty. Expected value is the sum of possible outcomes weighted by their probability of occurrence, and a preference between prospects can be judged purely on this basis under the expected value hypothesis, without reference to any personal utility function. Utility functions, and the concepts of concave (risk averse) or convex (risk seeking) curvature, belong to the SEPARATE expected utility hypothesis, not to expected value itself, which is just a plain, objective weighted sum.

Based on the above, look at the decision situation faced by Bablu.

Bablu had four options with probabilities of 0.1, 0.25, 0.5 and 1 respectively. The gains associated with each option are 1000,400, 200*and*100 respectively. Bablu chose the first option. As per the expected value hypothesis:

(A) Bablu is risk taking.

(B) The expected value function is concave.

(C) The expected value function is convex.

(D) It does not matter which option Bablu should choose.

Correct Answer: (D) It does not matter which option Bablu should choose.

SOLUTION:

Step 1: Build a quick table of expected values.
Option 1: $0.1 \times 1000 = 100$. Option 2: $0.25 \times 400 = 100$. Option 3: $0.5 \times 200 = 100$. Option 4: $1 \times 100 = 100$. Every single option lands on exactly \$100.

Step 2: Remember what the expected value hypothesis actually is.
Expected value theory just multiplies each outcome by its probability and adds them up, it is a plain arithmetic average, with no personal risk preference or curved utility built into it anywhere. It ranks options ONLY by this number.

Step 3: Rule out the risk-taking and curvature-based options.
Saying 'Bablu is risk taking' requires knowing something about how he personally values outcomes relative to their certainty, that is an expected UTILITY idea, and the expected value hypothesis, by itself, cannot support that conclusion just because he happened to pick the riskiest-looking option. Likewise, 'concave' and 'convex' describe the bend of a utility curve; the expected value calculation is a straight, linear weighted sum with no curve at all, so calling it 'concave' or 'convex' does not make sense. Both of these ideas confuse expected utility language with expected value theory.

Step 4: Settle on the correct reading.

Because all four of Bablu's options tie at exactly $100 in expected value, the expected value hypothesis treats them as interchangeable, there is no basis within this hypothesis to say one tied option is better than another.

Final Answer:
It does not matter which option Bablu should choose.

Indifferent, all tie at $100

Quick Tip: All four options tie at an expected value of $100, and the expected value hypothesis itself has no concept of risk attitude or curvature, so under this hypothesis alone, the four options are equally good.

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90. This group of questions is based on a set of conditions. In answering some of the questions, it may help to draw a rough diagram. Choose the response that most accurately and completely answers each question.

A circular field, with an inner radius of 10 meters and an outer radius of 20 meters, was divided into five successive stages for ploughing. The ploughing of each stage was handed over to a different farmer.
1. Farmers are referred to by the following symbols: F1, F2, F3, F4, F5.
2. The points between different stages of the project are referred to by the following symbols: P1, P2, P3, P4, P5, not necessarily in that order.
3. Farmer F5 was given the work of ploughing the stage starting at point P4.
4. The stage from point P5 to point P3 was not the first stage.
5. Farmer F4 was given the work of the fourth stage.
6. Stage 3 finished at point P1, and the work of it was not given to farmer F1.
7. Farmer F3 was given the work of the stage ending at point P5.

Which was the finish point for farmer F2?

(A) P1

(B) P2

(C) P3

(D) P4

Correct Answer: (A) P1

SOLUTION:

Step 1: Build a stage-to-point table from the two most specific clues first.
Condition 6 (Stage 3 ends at P1) and condition 7 (F3's stage ends at P5) are the two most specific facts, so start there. If F3's stage were Stage 3, it would have to end at P1 (from condition 6) and at P5 (from condition 7) at the same time, which is impossible, so F3 is NOT doing Stage 3.

Step 2: Use condition 4 to pin down where F3's stage sits.
Condition 4 says the P5-to-P3 stage is not Stage 1. Since F3's stage ends at P5, the stage right after F3's must be the one running P5 to P3, and that following stage cannot be Stage 1 (condition 4). Checking the stages in order, if F3 has Stage 1, the next stage (Stage 2) would be the P5-to-P3 one, which condition 4 allows since Stage 2 is not Stage 1, so this fits: F3 does Stage 1, ending at P5, and Stage 2 runs P5 to P3.

Step 3: Extend the chain using condition 6 again.
Stage 3 starts where Stage 2 ends, at P3, and condition 6 already tells us Stage 3 ends at P1. So Stage 3 goes P3 to P1.

Step 4: Bring in F5 and F4 to finish the point-labelling.
Condition 3 puts F5's stage starting at P4; since Stage 1 is taken by F3, F5 must be doing Stage 5, so Stage 5 starts at P4. Condition 5 gives Stage 4 to F4, running from Stage 3's end (P1) to Stage 5's start (P4), so Stage 4 is P1 to P4. The one label left over, P2, must be where Stage 5 ends and Stage 1 begins.

Step 5: Finish assigning farmers and read off F2.
Stage 1 is F3's and Stage 4 is F4's; Stage 5 is F5's (Step 4). That leaves Stage 2 and Stage 3 for F1 and F2. Condition 6 says F1 was NOT given Stage 3, so F1 has Stage 2 and F2 has Stage 3, which runs from P3 to P1.

Final Answer:
F2's finish point was P1.

$\boxed{P1}$

Quick Tip: Chain the stages forward from the fixed Stage 3 to P1 clue and the F3 ends-at-P5 clue, which pins Stage 1 to F3 and Stage 3 (ending at P1) to F2, since condition 6 rules F1 out of Stage 3.

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91. This group of questions is based on a set of conditions. In answering some of the questions, it may help to draw a rough diagram. Choose the response that most accurately and completely answers each question.

A circular field, with an inner radius of 10 meters and an outer radius of 20 meters, was divided into five successive stages for ploughing. The ploughing of each stage was handed over to a different farmer.
1. Farmers are referred to by the following symbols: F1, F2, F3, F4, F5.
2. The points between different stages of the project are referred to by the following symbols: P1, P2, P3, P4, P5, not necessarily in that order.
3. Farmer F5 was given the work of ploughing the stage starting at point P4.
4. The stage from point P5 to point P3 was not the first stage.
5. Farmer F4 was given the work of the fourth stage.
6. Stage 3 finished at point P1, and the work of it was not given to farmer F1.
7. Farmer F3 was given the work of the stage ending at point P5.

Which stage was ploughed by farmer F5?

(A) First
(B) Second
(C) Third
(D) Fifth

Correct Answer: (D) Fifth

SOLUTION:

Step 1: Work with the farmer clues directly instead of the point-chain first.
Condition 5 hands Stage 4 to F4 outright. Condition 7 hands F3 whichever stage ends at P5. Condition 6 fixes Stage 3 as ending at P1, which is a different point from P5, so F3 is definitely not doing Stage 3.

Step 2: Figure out which stage can end at P5.
Condition 4 blocks Stage 1 from being the 'P5 to P3' stage, meaning Stage 1 is not the stage that STARTS at P5. But nothing stops Stage 1 from being the stage that ENDS at P5, and testing this placement keeps every other clue consistent (Stage 2 then becomes the P5-to-P3 stage, which condition 4 allows since Stage 2 is not Stage 1). So F3's stage, ending at P5, is Stage 1.

Step 3: Fill in the rest of the chain.
Stage 2 runs P5 to P3 (from Step 2). Stage 3 then starts at P3 and, from condition 6, ends at P1. Stage 4 (F4's, from condition 5) starts where Stage 3 ends, at P1.

Step 4: Match F5's 'starts at P4' clue to a stage.
Condition 3 says F5's stage starts at P4. Since Stage 1 (F3), and Stage 4 (F4) are already assigned and neither starts at P4, and Stage 2 / Stage 3 start at P5 and P3 respectively, none of Stage 1 through Stage 4 starts at P4. By elimination, the only stage left, Stage 5, must be the one that starts at P4, matching F5's clue exactly.

Final Answer:
Farmer F5 ploughed the Fifth stage.

Fifth

Quick Tip: Chase the stage-to-point chain from the fixed Stage 3 to P1 clue; F3 ends up with Stage 1, F4 with Stage 4, which leaves Stage 5 as the only stage that starts at P4, matching F5's clue.

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92.

Directions: A circular field, with inner radius of 10 meters and outer radius of 20 meters, was divided into five successive stages for ploughing. The ploughing of each stage was handed over to a different farmer.

1. Farmers are referred to by the symbols F1, F2, F3, F4, F5.
2. The points between different stages are referred to by the symbols P1, P2, P3, P4, P5, not necessarily in that order.
3. Farmer F5 was given the work of ploughing the stage starting at point P4.
4. The stage from point P5 to point P3 was not the first stage.
5. Farmer F4 was given the work of the fourth stage.
6. Stage 3 finished at point P1, and the work of which was not given to farmer F1.
7. Farmer F3 was given the work of the stage ending at point P5.

Which were the starting and finishing points for stage 2?

(A) P2 and P5

(B) P5 and P3

(C) P3 and P1

(D) P5 and P4

Correct Answer: (B) P5 and P3

SOLUTION:

Instead of building the full loop first, test each option against the seven clues and see which one survives, since only one arrangement of points and farmers can satisfy all seven conditions at once.

1. **P2 and P5**: If stage 2 ran from P2 to P5, then combined with clue 6 (stage 3 finishes at P1), stage 3 would have to start at P5. Working the rest of the loop out from there, clue 3 (F5 starts at P4) and clue 7 (F3 ends at P5) end up pointing at the same stage, which cannot happen. This option fails.
2. **P5 and P3**: Placing "P5 to P3" as stage 2 leaves P1 as stage 3's finish, matching clue 6 directly, and lets P2 and P4 slot into stage 1 and stage 5 without any clash. Every one of clues 3, 5, and 7 holds in this layout. This option survives.
3. **P3 and P1**: This would make stage 2 finish at P1, but clue 6 already fixes P1 as the finish of stage 3. Two different stages cannot finish at the same point in a five-stage loop, so this is impossible.
4. **P5 and P4**: This forces stage 3, which must finish at P1 by clue 6, to start right after P4, leaving no consistent place for the "P5 to P3" stage required by clue 4. This option fails too.

Only "P5 and P3" keeps all seven clues true at once, so stage 2 starts at P5 and finishes at P3.

Let's summarize:

- The five stages form a loop, so each stage's finish point is the next stage's start point.
- Clue 6 anchors stage 3's finish at P1, the fastest peg to start from.
- Testing each option against that peg and the rest of the clues quickly rules out three of the four choices.

The correct answer is that stage 2 goes from P5 to P3.

Quick Tip: Fix stage 3's finish point first using clue 6, then use clue 4 to place the P5-to-P3 stage, and use clues 3 and 7 to resolve the last two points.

93.

Directions: A circular field, with inner radius of 10 meters and outer radius of 20 meters, was divided into five successive stages for ploughing. The ploughing of each stage was handed over to a different farmer.

1. Farmers are referred to by the symbols F1, F2, F3, F4, F5.
2. The points between different stages are referred to by the symbols P1, P2, P3, P4, P5, not necessarily in that order.
3. Farmer F5 was given the work of ploughing the stage starting at point P4.
4. The stage from point P5 to point P3 was not the first stage.
5. Farmer F4 was given the work of the fourth stage.
6. Stage 3 finished at point P1, and the work of which was not given to farmer F1.
7. Farmer F3 was given the work of the stage ending at point P5.

For which farmer was P2 a finishing point?

(A) F1

(B) F2

(C) F3

(D) F5

Correct Answer: (D) F5

SOLUTION:

We can answer this by noting which point each farmer's stage actually ends at, once the arrangement is pinned down from the clues, and matching that against the options.

1. **F1**: F1 ends up ploughing stage 2 (P5 to P3), since clue 6 rules out F1 for stage 3 and every other stage is already claimed by another farmer. Stage 2 finishes at P3, not P2, so this is wrong.
2. **F2**: F2 is left with stage 3 (P3 to P1), since F1 cannot take it. Stage 3 finishes at P1, not P2, so this is wrong.
3. **F3**: By clue 7, F3's stage ends at P5. That is stage 1 (P2 to P5), which finishes at P5, not P2, so this is wrong.
4. **F5**: By clue 3, F5's stage starts at P4. Once the loop is filled in, that stage (stage 5) runs P4 to P2, so it finishes at P2. This matches the question.

So the farmer whose stage finishes at P2 is F5.

Let's summarize:

- Once the five stages are pinned to specific points using clues 6 and 4, clues 3, 5, and 7 hand out the farmers one by one.
- Checking each farmer's finish point directly against P2 confirms the answer without redrawing the whole loop each time.

The correct answer is F5.

Quick Tip: Pin down the full loop of points using clues 6 and 4 first, then check which stage starts at P4, since clue 3 ties that stage to farmer F5.

94.

Directions: A circular field, with inner radius of 10 meters and outer radius of 20 meters, was divided into five successive stages for ploughing. The ploughing of each stage was handed over to a different farmer.

1. Farmers are referred to by the symbols F1, F2, F3, F4, F5.
2. The points between different stages are referred to by the symbols P1, P2, P3, P4, P5, not necessarily in that order.
3. Farmer F5 was given the work of ploughing the stage starting at point P4.
4. The stage from point P5 to point P3 was not the first stage.
5. Farmer F4 was given the work of the fourth stage.
6. Stage 3 finished at point P1, and the work of which was not given to farmer F1.
7. Farmer F3 was given the work of the stage ending at point P5.

Which was the starting point for farmer F3?

(A) P2

(B) P3

(C) P4

(D) P1

Correct Answer: (A) P2

SOLUTION:

We can check each option directly against the fixed arrangement of points and clue 7, instead of re-deriving the whole loop step by step.

1. **P2**: Once the loop is fixed as stage 1 = P2 to P5, stage 2 = P5 to P3, stage 3 = P3 to P1, stage 4 = P1 to P4, stage 5 = P4 to P2, the stage ending at P5 (clue 7, F3's stage) is stage 1, which starts at P2. This matches.
2. **P3**: The stage starting at P3 is stage 3, which ends at P1, not P5, so this cannot be F3's stage.
3. **P4**: The stage starting at P4 is stage 5, which by clue 3 belongs to F5, not F3, so this is wrong.
4. **P1**: The stage starting at P1 is stage 4, which by clue 5 belongs to F4, not F3, so this is wrong.

Only P2 lines up with clue 7's requirement that F3's stage ends at P5.

Let's summarize:

- Clue 7 is the fastest way to pin F3's stage once the loop of points is known.
- Checking each option's stage against clue 7 avoids reworking the whole puzzle from scratch.

The correct answer is P2.

Quick Tip: Clue 7 tells you F3's stage ends at P5. Once the loop of points is fixed using clues 6 and 4, read off the start of the stage that ends at P5.

95.

Children are in pursuit of a dog whose leash has broken. Krishnarajan is directly behind the dog. Rangarajan is behind Krishnarajan. Natrajan is behind Rangarajan. Premrajan is ahead of the dog walking down the street in the opposite direction. As the children and dog pass, Premrajan turns around and joins the pursuit. He runs in behind Rangarajan. Krishnarajan runs faster and is alongside the dog on the left. Rangarajan runs faster and is alongside the dog on the right. Which child is directly behind the dog?

(A) Krishnarajan

(B) Rangarajan

(C) Natrajan

(D) Premrajan

Correct Answer: (D) Premrajan

SOLUTION:

We can also settle this by checking each named child against the final positions described in the passage, instead of redrawing the whole line at once.

1. **Krishnarajan**: The passage states directly that "Krishnarajan runs faster and is alongside the dog on the left." Alongside means beside the dog, not behind it, so he cannot be the one directly behind.
2. **Rangarajan**: Likewise, "Rangarajan runs faster and is alongside the dog on the right" places him beside the dog too, not behind it.
3. **Natrajan**: Natrajan started at the very back of the original three children, behind Rangarajan. When Premrajan joined in "behind Rangarajan," he took a spot ahead of Natrajan in the line, so Natrajan ends up fourth, not directly behind the dog.
4. **Premrajan**: Premrajan joined the chase behind Rangarajan, which put him third from the dog at that point, right after Krishnarajan and Rangarajan. Once those two both moved out to flank the dog, Premrajan is the only one left in the direct trailing position.

So Premrajan is the child directly behind the dog.

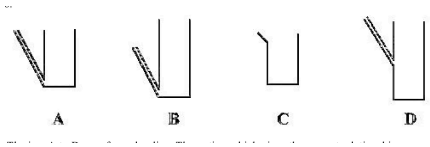
Let's summarize:

- Two children, Krishnarajan and Rangarajan, explicitly moved beside the dog, ruling themselves out of the "directly behind" spot.
- Between Natrajan and Premrajan, Premrajan's later entry point behind Rangarajan placed him closer to the dog than Natrajan.

The correct answer is Premrajan.

Quick Tip: Redraw the line of pursuit after each move described in the passage; once the two children ahead of the last spot move to flank the dog, whoever was next in line becomes the one directly behind it.

96.



The jars A to D are of equal radius. The option which gives the correct relationship among the capacity of jars is:

(A) A = B < C < D

(B) D > B = A = C

(C) B = D > A < C

(D) D > A = B > C

Correct Answer: (D) D > A = B > C

SOLUTION:

Since all four jars share the same radius, only the average of each jar's two rim heights decides its capacity, so we can rule out the options one at a time by checking the ordering each one claims.

1. **A = B < C < D**: The figure shows jar C as the shortest jar with the smallest average rim height, not a jar bigger than A and B, so a claim that C beats A and B cannot be right.
2. **D > B = A = C**: This bunches C together with A and B as equal, but jar C is visibly shorter and holds less liquid than A and B in the figure, so C cannot be tied with them.
3. **B = D > A < C**: This claims jar D equals jar B, but jar D's slanted cut is much shorter than jar A's or jar B's cut, giving jar D a clearly larger average height than either of them, so D cannot equal B.
4. **D > A = B > C**: Jar D's shorter cut gives it the largest average height, jars A and B share the same pair of rim heights so their capacities match, and jar C's shorter walls make it the smallest. This fits the figure exactly.

So the capacities rank as D > A = B > C.

Let's summarize:

- A slanted-top cylinder's capacity depends on the average of its two rim heights, not just the taller side.
- Matching cut patterns in A and B give matching capacities, while a shorter cut in D or shorter walls in C push the capacity up or down.

The correct relationship is D > A = B > C.

Quick Tip: A slanted-top jar's capacity depends on the average of its two rim heights, not just the taller wall; compare that average across the four jars in the figure.

97.

Caselet (Questions 97-100): Om Chowdhury was one of the supervisors in the Fire and Safety (F&S) department of Maqsood Textile Mills. He was a distant cousin of Mr. Bhiwani, the General Manager (Personnel & Administration), and the Personnel and Administration department handled all personnel-related decisions. It was often rumored that Om had gotten the job because of his cousin's influence. Om, however, was careful in his work and never gave anyone a reason to complain. He was known to be a quiet man who kept to himself and his duties.

All F&S supervisors reported to Mr. Rabindra, the shop-floor manager. The mill ran on a three-shift basis, and Rabindra allotted supervisors to the different shifts. Supervisors had to stay present through the whole shift and run scheduled checks on the machinery and firefighting equipment. For some reason, Rabindra kept assigning Om to the night shift more often than the other supervisors. Om never objected to this, while the other supervisors often pleaded with Rabindra to be given day shifts instead. Staying awake and alert through the night shift was one of the hardest parts of the job.

After a while, Rabindra noticed that Om seemed indifferent to his work. Twice he found Om missing from his cabin, and others told him Om had been seen wandering different parts of the shop floor. Rabindra called Om in and reminded him of his responsibilities. Om did not argue and promised not to be careless again. Rabindra also raised the matter with Mr. Bhiwani, who called Om in for a personal talk and reminded him that their family tie made the situation awkward for everyone. Om agreed to improve, and soon he became a model supervisor, even going out of his way to help employees with their problems.

Three months later, Rabindra visited the plant at night and, looking into the F&S office, found Om playing solitaire on the office computer. Rabindra fired Om on the spot.

The next morning, Mr. Bhiwani called Rabindra and asked how he could fire an employee like that, and suggested he reconsider the dismissal. Rabindra replied, "This decision has already been made. There will be no turning back."

Question: The options below give combinations of a possible root cause of the problem and its justification. Given the details in the case, which one can be inferred to be the best option?

(A) Hiring of Om. Reason: That ensured Om was perpetually casual towards his duties.

(B) Om favouring to work during the night shift. Reason: Absence of Rabindra ensured that Om could relax.

(C) Rabindra's bias against Om. Reason: Rabindra had been assigning too many night shifts to Om while being lenient with other supervisors.

(D) Rabindra jumping to conclusions. Reason: He should have investigated whether Om had carried out his duties.

Correct Answer: (D) Rabindra jumping to conclusions. Reason: He should have investigated whether Om had carried out his duties.

SOLUTION:

This question asks which pairing of "root cause" and "reason" best fits the facts of Om's firing. Let's weigh each option against what actually happened.

1. **A. Hiring of Om, because it made him casual:** the case says the opposite, Om was meticulous and became a model supervisor after his one warning, so "perpetually casual" does not match his record.
2. **B. Om favouring night shifts to relax in Rabindra's absence:** nothing in the story shows Om asked for night shifts or that Rabindra was ever absent from the plant; this is guesswork with no support in the text.
3. **C. Rabindra's bias in shift allocation:** this is a real pattern (Om got more night shifts) but it explains scheduling, not why Rabindra fired Om the moment he saw him at the computer.

4. **D. Rabindra jumping to conclusions, because he should have checked Om's duties first:** this fits cleanly. Rabindra saw one moment of apparent idleness and fired Om instantly, without confirming whether the required safety checks had been done that night.
5. **E. The firing causing a clash with Bhiwani:** this reverses cause and effect; the clash happened after and because of the firing, so it cannot be the firing's own root cause.

The best fit is D: Rabindra reacted to a single observation without investigating the facts, which is a classic case of jumping to conclusions.

Let's summarize:

- A snapshot of behaviour is not proof of a pattern, especially against three months of good performance.
- A good manager checks the record before punishing based on what he happens to see once.

So the most defensible root cause is option D.

Quick Tip: Look for the option where the "reason" genuinely explains the "root cause," not just a fact from the story.

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98.

Caselet (Questions 97-100): Om Chowdhury was one of the supervisors in the Fire and Safety (F&S) department of Maqsood Textile Mills. He was a distant cousin of Mr. Bhiwani, the General Manager (Personnel & Administration), and the Personnel and Administration department handled all personnel-related decisions. It was often rumored that Om had gotten the job because of his cousin's influence. Om, however, was careful in his work and never gave anyone a reason to complain. He was known to be a quiet man who kept to himself and his duties.

All F&S supervisors reported to Mr. Rabindra, the shop-floor manager. The mill ran on a three-shift basis, and Rabindra allotted supervisors to the different shifts. Supervisors had to stay present through the whole shift and run scheduled checks on the machinery and firefighting equipment. For some reason, Rabindra kept assigning Om to the night shift more often than the other supervisors. Om never objected to this, while the other supervisors often pleaded with Rabindra to be given day shifts instead. Staying awake and alert through the night shift was one of the hardest parts of the job.

After a while, Rabindra noticed that Om seemed indifferent to his work. Twice he found Om missing from his cabin, and others told him Om had been seen wandering different parts of the shop floor. Rabindra called Om in and reminded him of his responsibilities. Om did not argue and promised not to be careless again. Rabindra also raised the matter with Mr. Bhiwani, who called Om in for a personal talk and reminded him that their family tie made the situation awkward for everyone. Om agreed to improve, and soon he became a model supervisor, even going out of his way to help employees with their problems.

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The next morning, Mr. Bhiwani called Rabindra and asked how he could fire an employee like that, and suggested he reconsider the dismissal. Rabindra replied, "This decision has already been made. There will be no turning back."

Question: The details of the entire episode have become common knowledge among all the employees of the company. Out of the options below, which one presents the best way for the top management to resolve the issue so as to benefit the organization as a whole?

(A) Revoke Rabindra's order. It can be communicated to others that firing was too severe a punishment for such a small incident of indiscipline.

(B) Ask Om for clarification. It can be communicated that since Om had clarified regarding his duties, the order has been taken back.

(C) Declare Rabindra's order as void. Reiterate officially the disciplinary processes that need to be followed by managers along with their scope of authority.

(D) Ask for feedback from other employees on the shop floor regarding Om's performance. This can be used to revoke Rabindra's order.

Correct Answer: (B) Ask Om for clarification. It can be communicated that since Om had clarified regarding his duties, the order has been taken back.

SOLUTION:

The task is to pick top management's best move once the whole company already knows Om was fired. Let's go through the choices.

1. **A. Revoke the order and call firing too severe:** this openly tells every manager that a firing decision can be undone just because it looks harsh, which weakens discipline everywhere, not just in this case.
2. **B. Ask Om for clarification, then reverse the order citing his clarification:** this deals with the actual person involved, confirms the real facts of that night, and frames the reversal around new information rather than around overruling Rabindra, so his authority stays intact.
3. **C. Void the order and rewrite disciplinary rules and authority scope:** this is a much larger response than one incident needs, and turns a personal dispute into a full policy overhaul.
4. **D. Use general shop-floor feedback on Om to revoke the order:** other workers' opinions of Om in general do not tell management what actually happened on the night he was caught at the computer.
5. **E. Collect feedback from other F&S supervisors on night-shift work:** this is about the shift in general, not about resolving Om's specific firing.

Option B is the cleanest fix: it gets the facts straight from Om, corrects the decision if warranted, and does so in a way that does not undercut Rabindra's standing as a manager.

Let's summarize:

- Fixing a specific case should start with hearing the person directly involved, not general opinion.
- A reversal framed around new facts protects managerial authority better than a blanket "too harsh" ruling.

So option B best serves the organization as a whole.

Quick Tip: Think about what fixes Om's specific case without weakening every manager's authority to discipline staff.

99.

Caselet (Questions 97-100): Om Chowdhury was one of the supervisors in the Fire and Safety (F&S) department of Maqsood Textile Mills. He was a distant cousin of Mr. Bhiwani, the General Manager (Personnel & Administration), and the Personnel and Administration department handled all personnel-related decisions. It was often rumored that Om had gotten the job because of his cousin's influence. Om, however, was careful in his work and never gave anyone a reason to complain. He was known to be a quiet man who kept to himself and his duties.

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After a while, Rabindra noticed that Om seemed indifferent to his work. Twice he found Om missing from his cabin, and others told him Om had been seen wandering different parts of the shop floor. Rabindra called Om in and reminded him of his responsibilities. Om did not argue and promised not to be careless again. Rabindra also raised the matter with Mr. Bhiwani, who called Om in for a personal talk and reminded him that their family tie made the situation awkward for everyone. Om agreed to improve, and soon he became a model supervisor, even going out of his way to help employees with their problems.

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The next morning, Mr. Bhiwani called Rabindra and asked how he could fire an employee like that, and suggested he reconsider the dismissal. Rabindra replied, "This decision has already been made. There will be no turning back."

Question: Out of the options below, which one best sums up the learning from the solitaire incident?

(A) Managers often do not take any responsibility towards training juniors.

(B) People tend to become relaxed during the night shift, and this requires surprise checks to keep them on their toes.

(C) Certain roles have different ways of carrying out their duties.

(D) Having relatives in the same organization can be a source of potential problems.

Correct Answer: (C) Certain roles have different ways of carrying out their duties.

SOLUTION:

This question asks for the single best takeaway from the whole solitaire episode. Let's test the five statements against the story.

1. **A. Managers do not train juniors:** training of any kind is never mentioned in the case, so this cannot be the lesson drawn from it.
2. **B. Night-shift staff relax and need surprise checks:** this reads like a fix rather than a lesson, and it treats Om's one incident as proof of a wider pattern the case never actually shows.
3. **C. Different roles are carried out in different ways:** an F&S supervisor's job is largely to be present and alert for an emergency, so quiet stretches with little visible activity are a normal part of that job, unlike a role with constant, visible tasks. Mistaking this for idleness is exactly what tripped up Rabindra.
4. **D. Relatives in the same firm cause problems:** this is true of the Om-Bhiwani side detail, but it belongs to the hiring subplot, not to the specific judgment failure in the firing.
5. **E. Managers place silent people in certain roles:** the case never claims or implies this as a general rule.

Option C is the one that generalizes correctly from the actual events without inventing extra facts.

Let's summarize:

- A watch-and-check role naturally has idle-looking stretches once the checks are done.
- Judging such a role by the busy-ness standard of a different role produces a wrong reading of the person's conduct.

So the best summary of the learning is option C.

Quick Tip: Ask what is normal for a watch-and-check role like fire safety, versus a role with constant visible tasks.

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100.

Caselet (Questions 97-100): Om Chowdhury was one of the supervisors in the Fire and Safety (F&S) department of Maqsood Textile Mills. He was a distant cousin of Mr. Bhiwani, the General Manager (Personnel & Administration), and the Personnel and Administration department handled all personnel-related decisions. It was often rumored that Om had gotten the job because of his cousin's influence. Om, however, was careful in his work and never gave anyone a reason to complain. He was known to be a quiet man who kept to himself and his duties.

All F&S supervisors reported to Mr. Rabindra, the shop-floor manager. The mill ran on a three-shift basis, and Rabindra allotted supervisors to the different shifts. Supervisors had to stay present through the whole shift and run scheduled checks on the machinery and firefighting equipment. For some reason, Rabindra kept assigning Om to the night shift more often than the other supervisors. Om never objected to this, while the other supervisors often pleaded with Rabindra to be given day shifts instead. Staying awake and alert through the night shift was one of the hardest parts of the job.

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Three months later, Rabindra visited the plant at night and, looking into the F&S office, found Om playing solitaire on the office computer. Rabindra fired Om on the spot.

The next morning, Mr. Bhiwani called Rabindra and asked how he could fire an employee like that, and suggested he reconsider the dismissal. Rabindra replied, "This decision has already been made. There will be no turning back."

Question: Of the options below, which could have been a better response from Mr. Rabindra when he saw Om playing solitaire?

(A) He should have clarified his authority to fire employees.

(B) He should have informed Mr. Bhiwani about the incident and asked him to take the necessary action.

(C) He should have asked the employees of the shift about Om's performance of his duties.

(D) He should have checked whether Om had done his duties or not.

Correct Answer: (D) He should have checked whether Om had done his duties or not.

SOLUTION:

The question wants the better move for Rabindra right when he spotted Om at the computer. Let's look at each option.

1. **A. Clarify his own authority to fire:** this is about Rabindra's powers as a manager, not about establishing whether Om actually did anything wrong that night.
2. **B. Inform Bhiwani and ask him to act:** this skips straight to escalation without first finding out the facts, and also drags the awkward cousin relationship back into it.
3. **C. Ask other employees about Om's performance:** secondhand impressions from co-workers are a weaker check than looking at the actual record of completed safety checks.
4. **D. Check whether Om had done his duties:** this goes straight to the one fact that matters, were the scheduled checks done, and settles the question of misconduct directly and reliably.
5. **E. Check production levels for the shift:** production output is not what an F&S supervisor's duties are measured by, so this does not answer the real question.

Option D is the direct, fact-based first step Rabindra skipped before firing Om.

Let's summarize:

- Verify the specific duty in question before reacting to how something looks.
- Indirect checks, co-workers, production, authority questions, are weaker substitutes for looking at the actual record.

So the better response was option D.

Quick Tip: The missing fact at that moment was simple: had Om's scheduled checks actually been done?

101.

Caselet (Questions 101-104): Shekhar, an MBA from Singapore, returned to his hometown of Jamshedpur. Jamshedpur had a population of 10 lacs and one of the highest per capita incomes among Indian cities. Shekhar loved music. While listening to his favourite song on satellite radio one day, he wondered if he could combine his passion with a business. A few weeks later, by coincidence, Music World called for expressions of interest from potential franchisees. Jamshedpur did not have a single good music store where residents could buy quality, variety, and the latest releases.

Music World wanted its franchisees to own at least 1200 square feet of space and invest Rs. 30 lacs. Profits were to be split in the ratio of 3:7 between Music World and the franchisee. Shekhar liked the idea of working with a well-known brand, but he worried whether Rs. 30 lacs was too much money to put in. He did not have the full amount and was thinking of borrowing from a bank. He checked with other Music World franchisees in towns like Patna and Ranchi, expecting similar footfall in Jamshedpur. A franchisee in Patna reported monthly sales revenue of Rs. 1 to 2 lacs, with a profit margin of 25 to 30 percent. Satisfied with this, Shekhar decided to go ahead.

He then began looking for space. Jamshedpur had three main areas: Bistupur, Sakchi, and Sonari, all connected by good roads. Bistupur was a business area with most of the high-end retail stores, shopped at by the upper-middle and higher classes, and was also the city's education hub. Sakchi was a growing lower-middle-class business area, while Sonari was mostly residential.

Shekhar preferred Bistupur, since it was where he did his own shopping. But he ran into problems there: space was hard to find, and rentals had touched Rs. 30 to 40 per square foot per month, compared to Rs. 15 to 20 per square foot per month in Sakchi and Sonari. A friend who lived in Sakchi told him that several branded outlets were opening up there, and that it looked like the fastest-growing market in Jamshedpur with the highest share of teenagers. Still, Shekhar was against Sakchi because of its "downmarket" image. He wanted to target the college-going crowd, and he expected to find them in Bistupur.

The high real-estate cost in Bistupur, set against his low opinion of the Sakchi market, left Shekhar confused. To think the decision through properly, he decided to drive down the Jamshedpur-Ranchi highway in his newly bought car.

Question: How best should Shekhar resolve his confusion?

(A) By investing in the franchise.

(B) Do not invest in the franchise and look for a different brand name.

(C) Go back to Singapore and start to find the drivers and potential of the business.

(D) Do a further in-depth study to find the drivers and potential of the business.

Correct Answer: (D) Do a further in-depth study to find the drivers and potential of the business.

SOLUTION:

Shekhar is stuck between Bistupur and Sakchi with only borrowed assumptions to go on. Let's check what each option really means for him.

1. **A. Just invest in the franchise:** this commits Rs. 30 lacs before he has resolved the very confusion the question describes, which is premature.
2. **B. Drop the franchise and find another brand:** this throws away a genuine opportunity Shekhar has already found promising, purely because of a location dilemma that has not even been properly studied yet.
3. **C. Go back to Singapore to study the business:** Jamshedpur is where the actual market, footfall, and rental data live, so leaving the country adds no value here.

4. **D. Do a further in-depth study of the drivers and potential of the business:** this directly targets what is missing, real local data on footfall, spending habits in each area, and true growth potential, instead of guessing from Patna's numbers or a personal impression of "image."
5. **E. Approach a different music company:** this changes the brand, not the underlying location problem, so the same confusion would return.

Option D is the only choice that actually closes the information gap causing Shekhar's confusion.

Let's summarize:

- Confusion caused by missing data is fixed by getting the data, not by guessing or quitting.
- Borrowed benchmarks from another city are not a substitute for local research.

So the best resolution is option D.

Quick Tip: Confusion from missing information is resolved by getting more information, not by guessing or quitting.

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102.

Caselet (Questions 101-104): Shekhar, an MBA from Singapore, returned to his hometown of Jamshedpur. Jamshedpur had a population of 10 lacs and one of the highest per capita incomes among Indian cities. Shekhar loved music. While listening to his favourite song on satellite radio one day, he wondered if he could combine his passion with a business. A few weeks later, by coincidence, Music World called for expressions of interest from potential franchisees. Jamshedpur did not have a single good music store where residents could buy quality, variety, and the latest releases.

Music World wanted its franchisees to own at least 1200 square feet of space and invest Rs. 30 lacs. Profits were to be split in the ratio of 3:7 between Music World and the franchisee. Shekhar liked the idea of working with a well-known brand, but he worried whether Rs. 30 lacs was too much money to put in. He did not have the full amount and was thinking of borrowing from a bank. He checked with other Music World franchisees in towns like Patna and Ranchi, expecting similar footfall in Jamshedpur. A franchisee in Patna reported monthly sales revenue of Rs. 1 to 2 lacs, with a profit margin of 25 to 30 percent. Satisfied with this, Shekhar decided to go ahead.

He then began looking for space. Jamshedpur had three main areas: Bistupur, Sakchi, and Sonari, all connected by good roads. Bistupur was a business area with most of the high-end retail stores, shopped at by the upper-middle and higher classes, and was also the city's education hub. Sakchi was a growing lower-middle-class business area, while Sonari was mostly residential.

Shekhar preferred Bistupur, since it was where he did his own shopping. But he ran into problems there: space was hard to find, and rentals had touched Rs. 30 to 40 per square foot per month, compared to Rs. 15 to 20 per square foot per month in Sakchi and Sonari. A friend who lived in Sakchi told him that several branded outlets were opening up there, and that it looked like the fastest-growing market in Jamshedpur with the highest share of teenagers. Still, Shekhar was against Sakchi because of its "downmarket" image. He wanted to target the college-going crowd, and he expected to find them in Bistupur.

The high real-estate cost in Bistupur, set against his low opinion of the Sakchi market, left Shekhar confused. To think the decision through properly, he decided to drive down the Jamshedpur-Ranchi highway in his newly bought car.

Question: Suppose sales in Patna and Bistupur are likely to be the same, how many years would it take for Shekhar to recoup the investment (consider zero inflation)?

(A) Less than five years.

(B) Less than seven years.

(C) Less than eight years.

(D) May be never.

Correct Answer: (D) May be never.

SOLUTION:

This question wants a payback period for Shekhar's Rs. 30 lac investment, assuming Bistupur sells like Patna. Instead of picking a year figure straight away, it helps to actually run the numbers from the case and see where they land.

1. **Less than five years:** even at the best-case Patna numbers (Rs. 2 lacs revenue, 30% margin, so Rs. 0.6 lacs total monthly profit, and Shekhar's 70% share is Rs. 0.42 lacs a month, or about Rs. 5.04 lacs a year), payback works out to about 5.95 years, which is already past five years, so this is too optimistic.
2. **Less than seven years:** this matches only the best-case scenario, about 5.95 years; the worst case from the same Patna range runs to about 14.3 years, so "less than seven" only holds if Bistupur performs at the very top of the range.
3. **Less than eight years:** again true only near the best-case end of the range, not across the range Patna actually gives us.
4. **May be never:** the worst-case Patna scenario (Rs. 1 lac revenue, 25% margin, giving Shekhar about Rs. 2.1 lacs a year) needs roughly 14.3 years just on sales and margin alone, before adding Bistupur's much higher rent (Rs. 30 to 40 per square foot versus Rs. 15 to 20 elsewhere in the city), which is not included in the Patna benchmark and would cut further into the real profit.

Since the computed payback swings from about six years to well past fourteen depending on which end of Patna's own range applies, and Bistupur's extra rent burden would stretch it even further, no fixed year figure can be trusted. The safest, most honest reading is that recovery may never happen on a reliable basis.

Let's summarize:

- A range of inputs (revenue, margin) produces a range of paybacks, not one clean number.
- Ignoring location-specific costs like Bistupur's higher rent understates the true payback period.

So "may be never" is the answer that best respects this uncertainty.

Quick Tip: Work out the franchisee's own share of profit at both ends of Patna's range, then compare to Rs. 30 lacs, and remember Bistupur's rent is not even in that range yet.

103.

Caselet (Questions 101-104): Shekhar, an MBA from Singapore, returned to his hometown of Jamshedpur. Jamshedpur had a population of 10 lacs and one of the highest per capita incomes among Indian cities. Shekhar loved music. While listening to his favourite song on satellite radio one day, he wondered if he could combine his passion with a business. A few weeks later, by coincidence, Music World called for expressions of interest from potential franchisees. Jamshedpur did not have a single good music store where residents could buy quality, variety, and the latest releases.

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The high real-estate cost in Bistupur, set against his low opinion of the Sakchi market, left Shekhar confused. To think the decision through properly, he decided to drive down the Jamshedpur-Ranchi highway in his newly bought car.

Question: What could be the most likely reason for Shekhar's bias in favour of Bistupur?

(A) Presence of the college-going crowd, as he felt they were the customers for the latest music.

(B) The crowded ("hoi polloi") image of Sakchi.

(C) It was difficult for Shekhar to associate non-Bistupur areas with good-quality products.

(D) Higher rentals in Bistupur.

Correct Answer: (A) Presence of the college-going crowd, as he felt they were the customers for the latest music.

SOLUTION:

The question asks why Shekhar was biased toward Bistupur even though it cost him more and was harder to find space in. Let's check the options against the text.

1. **A. He expected college students to be his customers for the latest music:** the case states this directly, Shekhar "expected to target the college going crowd in Bistupur," and Bistupur is also called the city's education hub, so this is his own stated reasoning.
2. **B. Sakchi's crowded, downmarket image:** this is his reason for disliking Sakchi, related, but it answers a different question than what pulled him toward Bistupur.
3. **C. Difficulty linking non-Bistupur areas to good products:** this is a vaguer, more general version of the same idea, without the specific detail the case actually gives us.

4. **D. Higher rentals in Bistupur:** higher rent is what made Shekhar hesitant about Bistupur, the opposite of a reason to favour it.
5. **E. Patronage by executives and their families:** this detail never appears anywhere in the caselet.

Option A is the one grounded directly in what the case tells us about Shekhar's own expectations.

Let's summarize:

- The case names the college-going crowd explicitly as Shekhar's target customer.
- A location's higher cost cannot be the reason someone favours it; it is a reason for hesitation instead.

So option A is the answer.

Quick Tip: The case states Shekhar's own expectation about who his customers would be in Bistupur.

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104.

Caselet (Questions 101-104): Shekhar, an MBA from Singapore, returned to his hometown of Jamshedpur. Jamshedpur had a population of 10 lacs and one of the highest per capita incomes among Indian cities. Shekhar loved music. While listening to his favourite song on satellite radio one day, he wondered if he could combine his passion with a business. A few weeks later, by coincidence, Music World called for expressions of interest from potential franchisees. Jamshedpur did not have a single good music store where residents could buy quality, variety, and the latest releases.

Music World wanted its franchisees to own at least 1200 square feet of space and invest Rs. 30 lacs. Profits were to be split in the ratio of 3:7 between Music World and the franchisee. Shekhar liked the idea of working with a well-known brand, but he worried whether Rs. 30 lacs was too much money to put in. He did not have the full amount and was thinking of borrowing from a bank. He checked with other Music World franchisees in towns like Patna and Ranchi, expecting similar footfall in Jamshedpur. A franchisee in Patna reported monthly sales revenue of Rs. 1 to 2 lacs, with a profit margin of 25 to 30 percent. Satisfied with this, Shekhar decided to go ahead.

He then began looking for space. Jamshedpur had three main areas: Bistupur, Sakchi, and Sonari, all connected by good roads. Bistupur was a business area with most of the high-end retail stores, shopped at by the upper-middle and higher classes, and was also the city's education hub. Sakchi was a growing lower-middle-class business area, while Sonari was mostly residential.

Shekhar preferred Bistupur, since it was where he did his own shopping. But he ran into problems there: space was hard to find, and rentals had touched Rs. 30 to 40 per square foot per month, compared to Rs. 15 to 20 per square foot per month in Sakchi and Sonari. A friend who lived in Sakchi told him that several branded outlets were opening up there, and that it looked like the fastest-growing market in Jamshedpur with the highest share of teenagers. Still, Shekhar was against Sakchi because of its "downmarket" image. He wanted to target the college-going crowd, and he expected to find them in Bistupur.

The high real-estate cost in Bistupur, set against his low opinion of the Sakchi market, left Shekhar confused. To think the decision through properly, he decided to drive down the Jamshedpur-Ranchi highway in his newly bought car.

Question: Which one of the following is the most important decision criterion in such a business situation?

(A) Financial capability of the entrepreneur.

(B) Changes in the music industry.

(C) Future market growth.

(D) Real estate prices.

Correct Answer: (D) Real estate prices.

SOLUTION:

This question asks which factor should weigh most heavily in a business decision like Shekhar's. Let's weigh the five options.

1. **A. Financial capability of the entrepreneur:** this decides whether Shekhar can raise the Rs. 30 lacs at all, but says nothing about whether the store itself will succeed once it is funded.
2. **B. Changes in the music industry:** this is a broader, slower-moving factor, not the immediate constraint that is actually shaping Shekhar's location choice in the case.
3. **C. Future market growth:** relevant, but the case keeps returning to cost of space as the concrete, present-day sticking point, more than any growth projection.
4. **D. Profitability in the first couple of years:** this is an outcome that follows from the cost structure of the chosen location, not an independent criterion to weigh on its own.
5. **E. Real estate prices:** the case repeatedly centers on this exact trade-off, Bistupur's Rs. 30 to 40 per square foot rent against Sakchi and Sonari's Rs. 15 to 20, for a fixed 1200 square foot space, and this cost sets both the fixed cost base and which locations are financially workable at all.

Real estate cost is the factor that most concretely and most directly shapes both the choice of location and the resulting profit, so option E is the strongest answer.

Let's summarize:

- In a physical retail business, rent is often the single biggest lever on profitability.
- Personal finances, industry trends, and short-term profit are all downstream of the location and cost decision.

So the most important criterion here is option E.

Quick Tip: Ask which single factor most directly decides whether a small retail store like this can be profitable at all.