IBSAT 2019 Combined paper Question Paper with Solutions

ZOLLEGE

General Instructions

(i) This booklet contains 148 questions, each provided with a complete, step-by-step solution.

(ii) It comprises 140 single-correct multiple-choice questions.

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

1. Choose the option that is closest in meaning to the word given below.
DOLOROUS

(A) Happy

(B) Lachrymose

(C) Furious

(D) Angry

Correct Answer: (B) Lachrymose

SOLUTION:

Step 1: Understanding the Concept:
This question tests vocabulary knowledge, specifically the meaning of the word "dolorous" and its closest synonym among the given choices.

Step 2: Key Formula or Approach:
Break the word into its root. "Dolorous" comes from the Latin "dolor" (pain, grief) plus the suffix "-ous" (full of). So dolorous means full of grief or sorrow. The correct option must carry this same sad, mournful sense.

Step 3: Detailed Explanation:
"Happy" describes joy, the opposite of grief, so it is ruled out.
"Furious" and "Angry" both describe rage, a different emotion from sadness, so neither fits.
"Lachrymose" literally means tearful or prone to weeping, and it is commonly used for a sorrowful, mournful tone, which lines up with dolorous.

Step 4: Final Answer:
The word closest in meaning to "dolorous" is "Lachrymose," corresponding to option (B).

Quick Tip: Think about the Latin root "dolor," which means pain or grief; look for the option describing sadness, not anger or joy.

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2. Choose the option that is closest in meaning to the word given below.
PUISSANT

(A) Powerful
(B) Skillful
(C) Colorful
(D) Beautiful

Correct Answer: (A) Powerful

SOLUTION:

Step 1: Understanding the Concept:
This question checks whether you know the meaning of the somewhat old fashioned word "puissant" and can pick its closest synonym.

Step 2: Key Formula or Approach:
"Puissant" comes from the French "puissant," itself from Latin "posse" (to be able). It describes someone or something with great power or might, such as a puissant army or a puissant ruler.

Step 3: Detailed Explanation:
"Skillful" refers to ability and expertise, not raw power, so it is a weaker match.
"Colorful" and "Beautiful" both describe appearance, which has no link to power or might at all.
"Powerful" directly means having great strength, control, or influence, matching puissant word for word in sense.

Step 4: Final Answer:
The closest synonym of "puissant" is "Powerful," corresponding to option (A).

Quick Tip: Puissant is an old, formal word for mighty; think of a "puissant army" or "puissant king."

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3. Choose the option that is closest in meaning to the word given below.
RECTITUDE

(A) Immorality

(B) Fulmination

(C) Dissipation

(D) Integrity

Correct Answer: (D) Integrity

SOLUTION:

Step 1: Understanding the Concept:
This question tests the meaning of "rectitude" and asks for the word closest to it in sense.

Step 2: Key Formula or Approach:
"Rectitude" comes from the Latin "rectus," meaning straight or correct. In modern use it means moral uprightness, honesty, and correctness of behavior, so the answer must share this idea of good moral character.

Step 3: Detailed Explanation:
"Immorality" is a direct opposite, describing wrong or unethical conduct.
"Dissipation" describes wasteful, indulgent living, again the opposite of moral discipline.
"Fulmination" means a harsh, angry outburst of criticism, which has nothing to do with morality.
"Integrity" means firm adherence to moral and ethical principles, which lines up exactly with rectitude.

Step 4: Final Answer:
The closest synonym of "rectitude" is "Integrity," corresponding to option (D).

Quick Tip: Rectitude is built from the Latin "rectus," meaning straight or right; think of "moral straightness."

4. Choose the option that is closest in meaning to the word given below.
TEDIUM

(A) Variation

(B) Excitement

(C) Diversion

(D) Monotony

Correct Answer: (D) Monotony

SOLUTION:

Step 1: Understanding the Concept:
This question checks the meaning of "tedium," a fairly common word for boredom caused by repetition.

Step 2: Key Formula or Approach:
Tedium describes a dull, wearisome sameness, the feeling you get when a task drags on with no variety. The matching option must carry this sense of dull repetition, not relief from it.

Step 3: Detailed Explanation:
"Variation" and "Diversion" both suggest a break from routine or something new to enjoy, which is the opposite of tedium.
"Excitement" describes a thrilled, energized feeling, again the opposite of boredom.
"Monotony" directly means a tiresome lack of variety, the same dull routine repeated, matching tedium's meaning exactly.

Step 4: Final Answer:
The closest synonym of "tedium" is "Monotony," corresponding to option (D).

Quick Tip: Think of a "tedious" task: the same thing repeated over and over with no variety.

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5. Choose the option that is closest in meaning to the word given below.
MAWKISH

(A) Tendentious

(B) Mellifluous

(C) Maudlin

(D) Meridional

Correct Answer: (C) Maudlin

SOLUTION:

Step 1: Understanding the Concept:
This question tests the meaning of "mawkish," a word used to criticize excessive sentimentality.

Step 2: Key Formula or Approach:
Mawkish describes emotion that is overdone to the point of feeling sickly or false, such as a mawkish love story. The correct option must carry this same sense of exaggerated sentiment.

Step 3: Detailed Explanation:
"Tendentious" is about a biased viewpoint, not emotion, so it is unrelated.
"Mellifluous" describes a pleasant sound or voice, again a different quality altogether.
"Meridional" is a geographic or time related term, with no connection

to sentiment.
"Maudlin" means tearfully or foolishly sentimental, describing the exact same overdone emotional quality as mawkish.

Step 4: Final Answer:
The closest synonym of "mawkish" is "Maudlin," corresponding to option (C).

Quick Tip: Mawkish criticizes something for being too sugary and sentimental, like a maudlin, tearful movie scene.

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6. Choose the option that is most opposite in meaning (antonym) to the word given below.
JOCUND

(A) Brash

(B) Jocular

(C) Square

(D) Melancholic

Correct Answer: (D) Melancholic

SOLUTION:

Step 1: Understanding the Concept:
This question tests whether you know that "jocund" means cheerful and merry, and asks for its antonym, the word with the opposite meaning.

Step 2: Key Formula or Approach:

Since jocund describes a happy, lighthearted mood, its antonym must describe a sad, low mood. Options describing unrelated traits like boldness or old fashioned attitudes can be ruled out first, and any option too close in meaning to jocund itself must be rejected since the question wants the opposite, not a synonym.

Step 3: Detailed Explanation:
"Brash" means rudely bold or overconfident, a personality trait, not a mood, so it does not oppose jocund.
"Square" is slang for someone conventional or old fashioned, again unrelated to mood.
"Jocular" is a common trap here because it means playful and joking, almost a synonym of jocund, so picking it would be the opposite mistake.
"Melancholic" means sad, gloomy, and low spirited, which is the exact emotional opposite of cheerful jocund.

Step 4: Final Answer:
The antonym of "jocund" is "Melancholic," corresponding to option (D).

Quick Tip: Watch out for "Jocular," it sounds similar to jocund and means almost the same thing; the true opposite is a word for sadness.

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7. Choose the option that is most opposite in meaning (antonym) to the word given below.
INSCRUTABLE

(A) Comprehensible

(B) Confusing

(C) Contradictory

(D) Contemptible

Correct Answer: (A) Comprehensible

SOLUTION:

Step 1: Understanding the Concept:
This question checks the meaning of "inscrutable," which describes something mysterious and hard to read or understand, and asks for its antonym.

Step 2: Key Formula or Approach:
Since inscrutable means impossible to understand, its antonym must mean the reverse, easy to understand. Any option that describes something equally hard to follow should be treated as a trap, not the answer.

Step 3: Detailed Explanation:
"Contradictory" refers to inconsistency between statements, which is a different concept from clarity, so it does not oppose inscrutable directly.
"Contemptible" is about being worthy of scorn, unrelated to how understandable something is.
"Confusing" is the closest trap since it also describes something hard to follow, almost matching inscrutable rather than opposing it.
"Comprehensible" means clear and easy to grasp, which is the exact reverse of inscrutable's meaning.

Step 4: Final Answer:
The antonym of "inscrutable" is "Comprehensible," corresponding to option (A).

Quick Tip: Do not pick "Confusing," it means nearly the same as inscrutable; look for a word meaning easy to understand.

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8. Choose the option that is most opposite in meaning (antonym) to the word given below.
EXCORIATE

(A) Prevaricate

(B) Berate

(C) Regurgitate

(D) Acclaim

Correct Answer: (D) Acclaim

SOLUTION:

Step 1: Understanding the Concept:
This question tests the meaning of "excoriate," a strong word for harsh criticism, and asks for its antonym.

Step 2: Key Formula or Approach:
Since excoriate means to criticize or denounce someone severely, its antonym must be an equally strong word of praise, not a mild or unrelated term.

Step 3: Detailed Explanation:

"Prevaricate" means to avoid telling the truth directly, which relates to honesty, not to praise or blame.
"Regurgitate" means to bring something back up or repeat it mechanically, unrelated to criticism or praise.
"Berate" is the closest trap since it means to scold harshly, nearly the same meaning as excoriate rather than its opposite.
"Acclaim" means to praise loudly and enthusiastically, matching the intensity of excoriate's criticism but in the opposite, positive direction.

Step 4: Final Answer:
The antonym of "excoriate" is "Acclaim," corresponding to option (E), which takes the fourth answer slot in this four option version.

Quick Tip: Do not pick "Berate," it means nearly the same as excoriate; look for a strong word of praise instead.

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9. Choose the option which is the closest antonym of the given word.

GLUM

(A) Desire

(B) Cheerful

(C) Sour

(D) Gloomy

Correct Answer: (B) Cheerful

SOLUTION:

Step 1: Understanding the Question.
We are asked to pick the option that means the opposite of GLUM. GLUM describes someone who looks sad, low, and unhappy, often silent because of disappointment.

Step 2: Key Approach.
To find an antonym we first fix the core feeling the word carries, here a sad and low mood, and then look for the option that carries the opposite feeling, a happy and bright mood.

Step 3: Detailed Explanation.
Desire means wanting something strongly, which is not a mood word at all, so it cannot be an antonym of glum.
Sour points to a sharp taste or a bad temper, which sits closer to a low mood than a bright one, so it fails too.
Gloomy shares almost the same meaning as glum, both meaning sad and dark in mood, so it is a near synonym, not an antonym.
Cheerful means full of joy and good spirits, which is the exact opposite of a glum, low mood, making it the word we need.

Step 4: Final Answer.
The closest antonym of GLUM is Cheerful.

Quick Tip: Think about the opposite mood of someone who looks sad and low in spirits.

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10. Choose the option which is the closest antonym of the given word.

SCRAWNY

(A) Lean

(B) Skinny

(C) Emaciated

(D) Obese

Correct Answer: (D) Obese

SOLUTION:

Step 1: Understanding the Question.
We need the word that means the opposite of SCRAWNY. Scrawny describes a body that is thin, bony, and often weak looking.

Step 2: Key Approach.
Since scrawny is a word about body size, we can sort the options by how thin or how heavy each one describes, then pick the one that sits farthest from thin on that scale.

Step 3: Detailed Explanation.
Lean describes a thin but toned build, so it still sits on the thin side of the scale, close to scrawny.
Skinny is a plain word for very thin, again close in meaning to scrawny rather than its opposite.
Emaciated describes a body that has become dangerously thin, usually from hunger or sickness, which makes it an even stronger match for scrawny, not an opposite.
Obese describes a body that carries a large amount of excess weight, placing it at the far heavy end of the scale, directly across from scrawny.

Step 4: Final Answer.
The closest antonym of SCRAWNY is Obese.

Quick Tip: Think of a body type that sits at the opposite end of the weight scale from thin and bony.

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11. The first two words are related in a particular way. Choose the word that completes the second pair using the same relationship.

Weed : Garden :: Edit : ?

(A) Publisher

(B) Editor

(C) News

(D) Puzzle

Correct Answer: (C) News

SOLUTION:

Step 1: Understanding the Question.
We are given the pair Weed : Garden and must find a word that pairs with Edit in the same way.

Step 2: Key Approach.
First we name the exact link between the two given words, then we test each option to see which one holds that same link with the word Edit.

Step 3: Detailed Explanation.

A gardener weeds a garden, which means unwanted plants are pulled out so the garden stays in good shape. Here weed is an action and garden is what receives that action.
Checking Publisher against this link, a publisher is a person or a company, not something that gets edited, so the link breaks.
Checking Editor, this word names the person who performs the editing, again not the thing being edited, so it fails the same way.
Checking Puzzle, a puzzle is normally solved rather than edited in this sense, so the link does not carry over.
Checking News, a piece of news is written, then edited to fix mistakes and cut out anything that does not belong, before it goes out to readers. This mirrors weeding a garden exactly, since both describe cleaning up something before it is presented.

Step 4: Final Answer.
The word that completes Weed : Garden :: Edit : ? is News.

Quick Tip: Think about what weeding does to a garden, then look for the option that gets the same treatment from editing.

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12. Complete the analogy by choosing the option that best fits.
Incubator : Infant :: Greenhouse : ?

(A) Parasites

(B) Worms

(C) Puppies

(D) Saplings

Correct Answer: (D) Saplings

SOLUTION:

This is a relationship-based analogy question. We first read the given pair "Incubator : Infant" and describe the connection between the two words in a simple sentence, then look for the option that creates the same sentence with "Greenhouse".

1. **Parasites**: A greenhouse is not built to raise or protect parasites, so this pair does not carry the same nurturing relationship.
2. **Worms**: Worms may live in soil, but a greenhouse is not designed around growing or protecting worms, so this option breaks the pattern.
3. **Puppies**: Puppies are young animals, and a greenhouse plays no part in their growth, so this pair does not match the incubator-infant relationship.
4. **Saplings**: A greenhouse is a warm, controlled structure built specifically to protect and nurture young, delicate plants until they are strong enough to survive outside, exactly as an incubator protects a fragile infant.

The sentence "an incubator is a protected space that helps a fragile infant grow" becomes "a greenhouse is a protected space that helps a fragile sapling grow" when we substitute the last option, and that sentence holds true.

Let's summarize:

- An incubator nurtures a fragile infant in a controlled environment.
- A greenhouse plays the same nurturing role for young, delicate saplings.
- Parasites, worms, and puppies have no such controlled-growth relationship with a greenhouse.

So the correct completion is "saplings".

Quick Tip: Think about what an incubator does for a newborn, then ask what a greenhouse does for the same kind of thing in plants.

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13. Complete the analogy by choosing the option that best fits.
Pitch : Cricket :: Ring : ?

(A) Wrestling

(B) Boxing

(C) Badminton

(D) Tennis

Correct Answer: (B) Boxing

SOLUTION:

Step 1: Understanding the Concept:
This question tests knowledge of the specific name given to the playing area of different sports. "Pitch" is the word used for the ground on which cricket is played.

Step 2: Key Formula or Approach:
Match each sport to the exact term used worldwide for its arena, since the analogy depends on the precise vocabulary and not just a general idea of "a place to play".

Step 3: Detailed Explanation:
Wrestling usually takes place on a "mat" in modern competition, not a "ring", so it does not fit the exact vocabulary needed.

Badminton and Tennis are both played on a "court", a different word from "ring", so neither one matches.
Boxing is fought inside a roped, elevated square platform that is called a "ring" in every rulebook and broadcast, which is the exact counterpart to how "pitch" names the cricket ground.

Step 4: Final Answer:
Since "ring" is the specific term for the boxing arena, the answer is "boxing", option (b).

Quick Tip: Think about which sport is played inside a roped square platform called a ring.

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14. Complete the analogy by choosing the option that best fits.
Darkness : Ignorance :: Light : ?

(A) Intelligence

(B) Knowledge

(C) Cleverness

(D) Familiarity

Correct Answer: (B) Knowledge

SOLUTION:

This analogy uses two words as metaphors rather than literal objects. "Darkness" here does not mean the physical absence of light, it means "ignorance", the state of not knowing. We need the word that "light" stands for in the same figurative way.

1. **Intelligence**: This is a personal ability to think and learn, a trait someone is born with or develops, not simply the state of already knowing something.
2. **Knowledge**: This is the direct, standard opposite of ignorance, meaning the possession of facts and understanding, which is precisely what "light" symbolizes when paired against the "darkness" of ignorance.
3. **Cleverness**: This describes sharpness or wit in thinking, again a trait rather than the state of being informed.
4. **Familiarity**: This means being acquainted with something, a softer and less exact idea than the direct opposite of ignorance.

Out of the four, only "knowledge" pairs with "light" the same way "ignorance" pairs with "darkness", since both are common metaphors used together in phrases like "shedding light on a subject" or "living in the dark about something".

Let's summarize:

- Darkness is a common metaphor for ignorance.
- Light is the matching metaphor for knowledge.
- Intelligence, cleverness, and familiarity describe traits or degrees of acquaintance, not the direct opposite of ignorance.

So the correct answer is "knowledge", option (b).

Quick Tip: Darkness is often used as a metaphor for not knowing; think about what light is the metaphor for.

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15. Complete the analogy by choosing the option that best fits.
Nucleus : Cell :: Yolk : ?

(A) Grain

(B) Cob

(C) Fruit

(D) Egg

Correct Answer: (D) Egg

SOLUTION:

Step 1: Understanding the Concept:
This question is a part-to-whole analogy. The nucleus sits at the center of a cell and controls its activities, making it the defining central part of the cell.

Step 2: Key Formula or Approach:
Identify the whole object among the choices whose central part carries the exact name "yolk", since the analogy depends on that specific structural label rather than a loose similarity.

Step 3: Detailed Explanation:
Grain refers to a small dry seed of a cereal plant, and it has no component called a yolk.
A cob is the woody core of a corn plant that holds the kernels, again with no yolk inside it.
A fruit typically has a seed or core at its center, not a yolk, so this option is also incorrect.
An egg has a clear central part known specifically as the yolk, which is the yellow, nutrient-rich portion surrounded by the egg white.

Step 4: Final Answer:

Since the yolk is the named central part of an egg, just as the nucleus is the named central part of a cell, the answer is "egg", option (d).

Quick Tip: Think about which whole structure contains a yolk as its central part.

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16. Fill in the blanks with the pair of words that best fits the meaning of the sentence as a whole.
In human as in animal societies the elder _____ transmit by example to the younger the _____ experience accumulated by the group.

(A) Progeny ... lurid

(B) Generations ... collective

(C) Denizens ... repeated

(D) Luminary ... personal

Correct Answer: (B) Generations ... collective

SOLUTION:

The sentence describes older members of a society passing on group experience to younger members by example. We need a word for the "elder" group that fits the plural verb "transmit", and a second word describing the kind of experience that has been "accumulated by the group".

1. **Progeny ... lurid**: "Progeny" means children or offspring, which is the opposite of "elder", since the sentence needs the older members, not the younger ones. "Lurid" means shockingly vivid,

which has no connection to shared experience, so this pair fails on both counts.

2. **Generations ... collective**: "Generations" naturally names groups of elder members within a society, and it agrees with the plural verb "transmit". "Collective" means belonging to or shared by every member of a group, which matches "accumulated by the group" exactly.
3. **Denizens ... repeated**: "Denizens" simply means residents or inhabitants, with no sense of "elder" built in, and "repeated" describes something done again and again, not something built up as shared experience over time.
4. **Luminary ... personal**: "Luminary" refers to one outstanding or inspiring individual, which does not fit the plural "elder" group or the plural verb "transmit". "Personal" means belonging to one individual, which directly contradicts "accumulated by the group".

Testing each pair against both blanks at once shows that only "Generations ... collective" satisfies the grammar of the sentence and its meaning about experience shared across a whole group.

Let's summarize:

- The first blank needs a plural word for older members of a society.
- The second blank needs a word meaning shared by the whole group.
- Only "Generations" and "collective" satisfy both blanks together.

So the correct completion is "Generations ... collective", option (b).

Quick Tip: The first blank needs a plural group of older members, and the second blank needs a word meaning shared by the whole group.

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17. He was an _____ musician, had been awarded by the Saneet Natak academy during the second world war and _____ with the title of Rai Bahadur.

(A) Outstanding..... popularized

(B) Underestimated ..... declared

(C) Accomplished ..... honoured

(D) Impressive ..... assigned

Correct Answer: (C) Accomplished ..... honoured

SOLUTION:

Step 1: Understanding the Question:
We need to fill two blanks in a sentence about a musician who received an award and a title.

Step 2: Key Formula or Approach:
Look at the collocation each option forms with the fixed words around the blank, especially the phrase "with the title of".

Step 3: Detailed Explanation:
The phrase "with the title of" only pairs naturally with "honoured", since we say a person is honoured with a title, not assigned, declared, or popularized with a title.
Once the second blank is fixed as "honoured", the first blank must describe a musician worthy of an award, which rules out

"underestimated" and leaves "accomplished" as the word that matches a musician who earns recognition.

Step 4: Final Answer:
The sentence reads: "He was an accomplished musician, had been awarded by the Saneet Natak academy during the second world war and honoured with the title of Rai Bahadur." This matches option (c).

Quick Tip: Think about which word naturally follows "honoured with the title of" and which word describes a skilled musician.

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18. China and India _____ similarities in demography and natural resources and that is where those similarities _____.

(A) Exchange ..... close

(B) Surrender ..... expand

(C) Support ..... pass

(D) Share ..... end

Correct Answer: (D) Share ..... end

SOLUTION:

Step 1: Understanding the Question:
We must pick the pair of words that best completes a sentence about China and India having common features that stop at some point.

Step 2: Key Formula or Approach:
Test each pair by reading the full sentence aloud and checking if the verb fits naturally with "similarities" as its object in both halves of the

sentence.

Step 3: Detailed Explanation:
"Similarities" is not something a country "surrenders" or "supports", so options (b) and (c) fail on the first blank.
"Exchange" also does not fit, since a similarity is not passed between two parties like an object.
"Share" is the only verb that naturally means "having something in common", and pairing it with "end" correctly closes the sentence with the idea that the common ground has a limit.

Step 4: Final Answer:
The sentence reads: "China and India share similarities in demography and natural resources and that is where those similarities end." This matches option (d).

Quick Tip: Ask which verb naturally goes with "similarities" as its object, and which verb describes something coming to a stop.

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19. The role of the Press cannot be _____ even in dictatorship, because even a dictator needs the press for _____ his ideology and policies.

(A) Eulogised ..... supressing

(B) Minimized ..... reflecting

(C) Exploited ..... writing

(D) Misused ..... broadcasting

Correct Answer: (B) Minimized ..... reflecting

SOLUTION:

Step 1: Understanding the Question:
We need two words that explain why the role of the press stays important even to a dictator.

Step 2: Key Formula or Approach:
Focus on the logic of the sentence: it says the role "cannot be ____", which means we need a word for reducing or downplaying importance, and then it gives the reason why, which should describe what the press does for the dictator's ideology.

Step 3: Detailed Explanation:
"Eulogised" means praised, which does not fit "cannot be eulogised" as a statement about importance.
"Exploited" and "misused" describe wrong use of the press, but they do not connect as smoothly with the reasoning clause as "minimized" does.
"Minimized" directly matches the sense of "the role cannot be reduced in importance", and "reflecting his ideology" is the natural reason, since a dictator uses the press to project his own views to the public.

Step 4: Final Answer:
The sentence reads: "The role of the Press cannot be minimized even in dictatorship, because even a dictator needs the press for reflecting his ideology and policies." This matches option (b).

Quick Tip: Think about what a dictator uses the press for, and what word means "reduced in importance".

20. Modern methods of _____ earthquakes recognize that quakes, far from being geologic anamalies, are part of the periodic accumulation and discharge of _____ energy.

(A) Identifying ..... iconic

(B) Locating ..... cosmic

(C) Predicting ..... seismic

(D) Watching ..... heavenly

Correct Answer: (C) Predicting ..... seismic

SOLUTION:

Step 1: Understanding the Question:
We need to complete a sentence about how modern science studies the pattern behind earthquakes.

Step 2: Key Formula or Approach:
Match each option to the scientific idea in the sentence: earthquakes are described as part of a periodic build up and release of a specific type of energy, so we need the standard scientific term for that energy, and a verb describing modern science's forward looking approach to quakes.

Step 3: Detailed Explanation:
"Iconic", "cosmic" and "heavenly" are not terms used to describe the energy inside the earth that causes quakes, so options (a), (b) and (d) fail on the second blank.
"Seismic" is the correct scientific word for earthquake related energy, and it pairs naturally with "predicting", since scientists try to foresee quakes by tracking this energy build up.

Step 4: Final Answer:
The sentence reads: "Modern methods of predicting earthquakes recognize that quakes, far from being geologic anamalies, are part of the periodic accumulation and discharge of seismic energy." This matches option (c).

Quick Tip: Recall the scientific term for the energy released in an earthquake, and the verb for foreseeing an event.

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21. Read the sentence below and find out which part contains an error. If there is no error, the answer is "No error".

The mutual co-operation **(a)** of employees is **(b)** essential to the success **(c)** of business. **(d)**

(A) The mutual co-operation

(B) of employees is

(C) essential to the success

(D) of business.

Correct Answer: (A) The mutual co-operation

SOLUTION:

Step 1: Understanding the Question:
The sentence is split into four parts, and we must find the part that has a grammar error, or say there is no error.

Step 2: Key Formula or Approach:
Check each part for redundancy, meaning two words that repeat the

same sense, since that is a common error type in this kind of question.

Step 3: Detailed Explanation:
The word "co-operation" already means working together, so it carries the idea of "mutual" inside its own meaning.
Placing "mutual" in front of "co-operation" repeats the same idea a second time, which is not correct usage.
The remaining parts, "of employees is", "essential to the success" and "of business.", are grammatically fine and need no change.

Step 4: Final Answer:
The error is in part (a), "The mutual co-operation", because "mutual" is redundant before "co-operation".

Quick Tip: Ask whether "co-operation" already includes the meaning of "mutual" on its own.

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22. Read the sentence below and find out which part contains an error. If there is no error, the answer is "No error".

Not less than **(a)** fifty **(b)** passengers were **(c)** killed in the bus accident. **(d)**

(A) Not less than

(B) fifty

(C) passengers were

(D) killed in the bus accident.

Correct Answer: (A) Not less than

SOLUTION:

Step 1: Understanding the Question:
We must find which underlined part of the sentence about the bus accident has a grammar error.

Step 2: Key Formula or Approach:
Recall the rule that "fewer" is used with countable nouns and "less" is used with uncountable nouns.

Step 3: Detailed Explanation:
"Passengers" can be counted one by one, fifty one passenger, fifty two passengers, and so on, so it is a countable noun.
Countable nouns take "fewer" in comparisons, not "less", so "not less than fifty passengers" breaks this rule and should read "not fewer than fifty passengers".
The rest of the sentence, "fifty", "passengers were" and "killed in the bus accident.", follows correct grammar.

Step 4: Final Answer:
The error is in part (a), "Not less than", since "less" is the wrong word to use with the countable noun "passengers".

Quick Tip: Check whether "passengers" is a countable noun, and recall which word, "less" or "fewer", goes with countable nouns.

23. Read the sentence below and find out which part contains an error. If there is no error, the answer is "No error".

The Chairmen of all large **(a)** private sector banks met with **(b)** senior World bank officials to give its **(c)** suggestions about implementing the new policy. **(d)**

(A) The Chairmen of all large

(B) private sector banks met with

(C) senior World bank officials to give its

(D) suggestions about implementing the new policy.

Correct Answer: (C) senior World bank officials to give its

SOLUTION:

Step 1: Understanding the Question:
We need to find the part of the sentence about bank chairmen and World bank officials that has a grammar error.

Step 2: Key Formula or Approach:
Trace the pronoun "its" back to the noun it is meant to replace, and check if the number, singular or plural, matches.

Step 3: Detailed Explanation:
The sentence begins with "The Chairmen", which is plural, and later uses "its suggestions" to refer back to that group.
A plural noun needs a plural pronoun, so "its" is the wrong choice, and it should be replaced with "their".
The other parts of the sentence, the plural verb "met" and the closing phrase about the policy, do not have any error.

Step 4: Final Answer:
The error is in part (c), "senior World bank officials to give its", since "its" should be "their" to agree with the plural "Chairmen".

Quick Tip: Trace the pronoun "its" back to the noun it replaces and check if the number matches.

• • •

24. Read the sentence below and find out which part contains an error. If there is no error, the answer is "No error".

The sun hadn't hardly **(a)** set when the mosquitoes began to sting **(b)** so annoyingly that we had **(c)** to run off from the playground. **(d)**

(A) The sun hadn't hardly

(B) set when the mosquitoes began to sting

(C) so annoyingly that we had

(D) to run off from the playground.

Correct Answer: (A) The sun hadn't hardly

SOLUTION:

Step 1: Understanding the Question:
We need to find the part of the sentence about the sunset and mosquitoes that has a grammar error.

Step 2: Key Formula or Approach:
Recall that words such as "hardly", "scarcely" and "barely" are already negative, so using another negative word with them creates a double negative error.

Step 3: Detailed Explanation:
The phrase "hadn't hardly" combines the negative "had not" with the already negative "hardly", which is not allowed in standard grammar. The correct form should simply be "had hardly set", without the extra "not".
The rest of the sentence, describing the mosquitoes stinging and the group running off from the playground, is grammatically correct.

Step 4: Final Answer:
The error is in part (a), "The sun hadn't hardly", since "hardly" should not be combined with another negative word like "hadn't".

Quick Tip: Remember that "hardly" is already negative, so check if it has been paired with another negative word.

• • •

25. A wise and experienced manager will assign a job to whom ever is best qualified.

(A) A wise and experienced
(B) manager will assign
(C) a job to whom ever is
(D) best qualified

Correct Answer: (D) best qualified

SOLUTION:

Step 1: Understanding the Question.
This is a spot the error question. The sentence is broken into four

labeled chunks, and only one chunk, or none, contains a grammar problem.

Step 2: Key Rule to Apply.
Superlative degree words such as best, worst, tallest, and most qualified are marked with the definite article 'the' in standard English, because a superlative singles out one item from a group.

Step 3: Detailed Explanation.
Go through the sentence piece by piece. 'A wise and experienced' simply describes the manager and is fine. 'Manager will assign' is a normal subject plus future tense verb, also fine. 'A job to whom ever is' sets up the clause that follows and reads smoothly on its own. That leaves 'best qualified', which uses the superlative 'best' without the article 'the' in front of it. Standard usage calls for 'the best qualified', the same way we say 'the most qualified candidate', not 'most qualified candidate'.

Step 4: Final Answer.
The missing article before the superlative 'best' places the error in the fourth part of the sentence, so the answer is option (d), best qualified.

Quick Tip: Superlative adjectives like 'best' normally need the definite article 'the' before them.

• • •

26. When you leave out a player who is the best in the country by a mile, the people need to know the real reasons and this is where the attitude of the BCCI is depressing.

(A) Who is the best in the country by a mile

(B) Who is the best in the country

(C) Who is the best in the country for a mile

(D) Who is the best in the country with a mile

Correct Answer: (B) Who is the best in the country

SOLUTION:

Step 1: Understanding the Question.
The underlined part of the sentence, 'who is the best in the country by a mile', may or may not need a fix. Option (a) always repeats the original wording, so we are really asking if the sentence is already correct or if one of the other choices reads better.

Step 2: Key Rule to Apply.
An idiom like 'by a mile' is used to measure the size of a gap in a race or a comparison, such as 'she finished by a mile'. It should not be stuck onto a simple statement of superiority like 'the best', because 'the best' already means first place, with no gap left to measure.

Step 3: Detailed Explanation.
Testing each option against the sentence: 'by a mile' (option a) hangs awkwardly off 'the best' and adds nothing meaningful. 'for a mile' (option c) and 'with a mile' (option d) are not real English collocations with 'best' and just sound wrong. Only 'who is the best in the country' (option b), with the extra phrase dropped entirely, reads as a natural, grammatically complete claim about the player's ranking.

Step 4: Final Answer.

Removing the misplaced idiom gives the correct sentence, so the answer is option (b), who is the best in the country.

Quick Tip: Check whether the extra phrase 'by a mile' adds anything correct or necessary to the sentence.

• • •

27. The reason why she is absent today is because her husband is ill.

(A) Absent today is because her husband is ill.

(B) Absent today because her husband is ill.

(C) Absent today is that her husband is ill.

(D) Absent today is because her husband illness.

Correct Answer: (C) Absent today is that her husband is ill.

SOLUTION:

Step 1: Understanding the Question.
We need to check the clause 'absent today is because her husband is ill' for a common structural error involving the word 'reason'.

Step 2: Key Rule to Apply.
In formal English, the pattern 'the reason...is because' is treated as redundant, since 'reason' already contains the sense of 'because'. The accepted fix is to follow 'the reason...is' with 'that' instead.

Step 3: Detailed Explanation.
The original sentence, 'The reason why she is absent today is because her husband is ill', repeats cause twice, once through 'reason' and once through 'because'. Checking the choices: option (b) removes 'is' and

breaks the clause. Option (d) leaves 'her husband illness' without a verb, which is not a valid clause. Option (c), 'absent today is that her husband is ill', swaps in 'that' and removes the repetition cleanly while keeping the sentence grammatical.

Step 4: Final Answer.
Replacing 'because' with 'that' is the standard correction, so the answer is option (c), absent today is that her husband is ill.

Quick Tip: 'The reason...is because' is a classic redundancy; the clause after 'reason...is' should start with 'that'.

• • •

28. It was she, not me, who put forth the attractive propositions.

(A) She, not me,

(B) Her, not me,

(C) Her, not I,

(D) She, not I,

Correct Answer: (D) She, not I,

SOLUTION:

Step 1: Understanding the Question.
The task is to fix the pronoun pair in 'It was she, not me, who put forth the attractive propositions', if it needs fixing.

Step 2: Key Rule to Apply.
A pronoun right after 'it was' that also functions as the subject of a following clause, here 'who put forth', must be in the subject case: I,

she, he, we, they. Object pronouns like me, her, him do not belong in that position.

Step 3: Detailed Explanation.
'She' in the original is already correct, but 'me' is an object pronoun sitting where a subject pronoun belongs, so it needs to become 'I'. Checking the other choices, 'her, not me' and 'her, not I' both start with the wrong case for the first pronoun, so they cannot be right. Only changing 'me' to 'I' while keeping 'she' gives two matching subject pronouns.

Step 4: Final Answer.
The fixed phrase is 'she, not I,', so the answer is option (d).

Quick Tip: 'It was she' needs the subject pronoun; keep both halves of the comparison in the same case, 'she' and 'I'.

• • •

29. It is with a heavy heart that I pen these few lines to condole for you on the death of your beloved mother.

(A) Condole for you on

(B) Condole with you in

(C) Condole upon you on

(D) Condole with you on

Correct Answer: (D) Condole with you on

SOLUTION:

Step 1: Understanding the Question.
We need to check whether 'to condole for you on the death' uses the right prepositions after the verb 'condole'.

Step 2: Key Rule to Apply.
Certain verbs in English are always followed by a fixed preposition, and this does not change with context. 'Condole' is one such verb: you condole with a person and you condole on an event, giving the fixed phrase 'condole with someone on something'.

Step 3: Detailed Explanation.
The original uses 'for' before 'you', which is not the idiom English speakers use with 'condole'. Option (b) fixes the first preposition to 'with' but then uses 'in' instead of 'on' before 'the death', so it is still wrong. Option (c) uses 'upon' for the person instead of 'with', which is also incorrect. Option (d) gets both prepositions right, 'with you' for the person and 'on' for the event, matching the fixed idiom exactly.

Step 4: Final Answer.
Since both prepositions must match the fixed idiom 'condole with someone on something', the answer is option (d), condole with you on.

Quick Tip: The verb 'condole' pairs with 'with' for the person and 'on' for the event: condole with someone on something.

• • •

30. Neither the manager nor the Cashier were able to report on the Company's progress.

(A) Neither the manager nor the Cashier were able to

(B) Neither the manager or the Cashier were able to

(C) Neither the manager nor the Cashier could able to

(D) Neither the manager nor the Cashier was able to

Correct Answer: (D) Neither the manager nor the Cashier was able to

SOLUTION:

Step 1: Understanding the Question.
We are checking subject verb agreement in 'Neither the manager nor the Cashier were able to report on the Company's progress'.

Step 2: Key Rule to Apply.
When subjects are joined by 'either...or' or 'neither...nor', the verb must agree with the subject that is closer to it, not with the first subject named. Here the nearer subject is 'the Cashier', which is singular, so the verb must be singular too.

Step 3: Detailed Explanation.
The original sentence uses 'were', a plural verb, which does not match the singular 'the Cashier'. Changing 'nor' to 'or' in one option is also wrong, since 'neither' must always be paired with 'nor'. Another option combines 'could' with 'able to', which is redundant since both express ability and should not be stacked together. The version that fixes the real issue keeps 'neither...nor' and switches the verb to the singular 'was', matching 'the Cashier'.

Step 4: Final Answer.
The correct verb form is 'was able to', so the answer is the option reading 'Neither the manager nor the Cashier was able to'.

Quick Tip: With 'neither...nor', the verb agrees with the subject nearer to it; 'the Cashier' is singular, so use 'was', not 'were'.

• • •

31. Arrange the following parts into a coherent sentence/passage:
P. Children need to be loved, and in a sense they cannot have too much of it.
Q. She herself doesn't want to grow up and attempts to make time stand still.
R. Fortunately she cannot succeed.
S. But it is not because of love that a mother prevents her child from growing up.

(A) QRSP

(B) SPQR

(C) PQRS

(D) PSQR

Correct Answer: (D) PSQR

SOLUTION:

Step 1: Understanding the Question.
Four sentences, P, Q, R, and S, need to be placed in the order that makes the passage read as one coherent piece of writing.

Step 2: Key Approach.
Look for pronouns without a clear earlier reference, and for linking words like 'But' and 'Fortunately' that depend on something being said just before them. Whichever sentence introduces 'a mother' must come before the sentence that refers to her as 'she'.

Step 3: Detailed Explanation.
P gives the opening idea, that children need love and cannot have too much of it. S starts with 'But', which sets up a contrast with P and is the first sentence to mention 'a mother', so S must follow P directly. Q then uses 'She herself' to refer back to that mother, so Q must come right after S. R starts with 'Fortunately', which only makes sense once we know the mother is attempting something and might fail, so R must come last, after Q. Putting these links together gives the sequence P, S, Q, R.

Step 4: Final Answer.
The passage reads correctly as PSQR, so the answer is option (a).

Quick Tip: Start with the sentence that states the general idea about children needing love, then look for the contrast introduced by 'But'.

• • •

32. Arrange the following parts into a coherent sentence/passage:
P. It would perhaps be possible for you to be of some use to this brave little boy.
Q. She said to herself silently at first, that
R. Without neglecting anything of what was due to her important mission.
S. And this idea pleased her.

(A) PSQR

(B) RSQP

(C) QRPS

(D) QSPR

Correct Answer: (C) QRPS

SOLUTION:

Step 1: Understanding the Question.
Four fragments, P, Q, R, and S, must be arranged into the order that reads as a single natural sentence about a woman weighing an idea.

Step 2: Key Approach.
Find the fragment that can stand as the main clause and introduce the subject 'she', then trace which fragments logically complete her thought before the sentence closes with her reaction.

Step 3: Detailed Explanation.
Q is the only fragment that names the subject, 'She said to herself silently at first, that', and it ends in 'that', which signals a reported thought is coming next. R, 'without neglecting anything of what was due to her important mission', reads as a condition attached to that coming thought, so it fits right after Q. P, 'it would perhaps be possible for you to be of some use to this brave little boy', completes the actual content of the thought that R sets a condition on. S, 'And this idea pleased her', can only follow once the full idea has been stated, since 'this idea' needs something concrete to point back to. This chain gives the order Q, R, P, S.

Step 4: Final Answer.
The coherent order is QRPS, so the answer is option (c).

Quick Tip: Look for which part can naturally open the sentence with 'She said...' and follow the chain of thought that ends in 'pleased her'.

33.

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

P. The real challenge today is unlearning, which is much harder.

Q. The new world of business behaves differently from the world in which we grew up.

R. Learning is important for both people and organizations however.

S. Each of us has a mental model that we've used over the years to make sense, but.

(A) SPQR

(B) RSPQ

(C) RSQP

(D) RPSQ

Correct Answer: (D) RPSQ

SOLUTION:

This question checks whether the four sentence parts P, Q, R and S can be joined back into one logical passage about learning and unlearning in business. Let's check each of the given sequences.

1. **SPQR**: Starting with S ("Each of us has a mental model...but") leaves the word "but" hanging with no earlier idea to contrast against, so this order does not read naturally from the first line.
2. **RSPQ**: This opens correctly with R, but jumping straight to S breaks the "however" in R, which needs to be answered by P, the unlearning challenge, not by S.

3. **RSQP**: This again opens with R but moves to S before P, so the contrast signalled by "however" is left unresolved, and P ends up placed where it no longer explains anything.
4. **RPSQ**: R sets up the contrast with "however," P supplies that contrast, S explains why with the mental-model idea and ends on "but," and Q completes that final contrast by describing the new business world. Every link connects.

The order RPSQ is the only one where every linking word is answered by the part that comes right after it. This corresponds to option (d).

Let's summarize:

- R opens the passage and sets up a contrast with "however".
- P answers that contrast by naming unlearning as the real challenge.
- S explains the cause and sets up a second contrast with "but".
- Q closes the passage by answering that second contrast.

So the correct sequence is RPSQ.

Quick Tip: Look for the part that opens the idea and track the words "however" and "but," which signal the contrast that must be answered by the next part.

34.

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

P. Passengers were told to be ready to quit the ship.

Q. The rising gale fanned the smoldering fire.

R. Everyone now knew there was fire on board.

S. Flames broke out here and there.

(A) SRQP

(B) QPSR

(C) RSPQ

(D) QSRP

Correct Answer: (A) SRQP

SOLUTION:

This passage describes a fire breaking out on a ship, and we need to find the order of events that tells the story clearly. Let's check the sequences given as options.

1. **SRQP**: Flames break out first, then everyone learns there is fire on board, then the gale makes the fire worse, and finally the passengers are told to prepare to leave the ship. Each part follows naturally as the next event in time.
2. **QPSR**: This starts with the gale fanning a "smoldering" fire before any flames have even broken out, and before passengers even know there is a fire, which does not follow a sensible timeline.

3. **RSPQ**: This has everyone knowing about the fire before the flames have broken out, which reverses cause and effect.
4. **QSRP**: This again puts the gale fanning the fire before the flames break out and before anyone is aware of the danger, so the order of events is scrambled.

Only SRQP keeps every event in the order it would actually happen: flames appear, people notice, wind worsens the fire, passengers are warned. This corresponds to option (a).

Let's summarize:

- The passage is best solved by tracking the natural timeline of a fire emergency.
- Any order that mentions awareness or worsening of the fire before the flames actually break out breaks the logic of the story.

So the correct sequence is SRQP.

Quick Tip: Think about the natural order events would happen in a fire emergency: first the fire starts, then people notice it, then it gets worse, then action is taken.

35.

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

P. He dares not say "I think", "I am" but quotes some saint or sage.

Q. These roses under my window make no reference to former roses or to better ones.

R. He is ashamed before the blade of grass or the blowing rose.

S. Man is timid, apologetic and no longer upright.

(A) QRSP

(B) SPQR

(C) QSPR

(D) SPRQ

Correct Answer: (D) SPRQ

SOLUTION:

This passage reflects on how modern man has lost his original voice and become timid, closing with an image of roses that live fully in the present. Let's test the given sequences.

1. **QRSP**: Starting with "These roses under my window" gives no context for what "these roses" refers to, since the reader has not yet been told that roses are being compared to man's shame.
2. **SPQR**: This opens correctly with S and P, but jumping to Q before R breaks the link, since Q's mention of "these roses" only makes sense right after R introduces the rose image.

3. **QSPR**: Again this opens with the roses before the reader has any reason to expect them, so the passage lacks a clear introduction.
4. **SPRQ**: S states the general idea of man's timidity, P explains how that timidity shows in his speech, R extends it into shame before nature including "the blowing rose," and Q then gives the concrete detail about those very roses. Every part sets up the next.

Only SPRQ moves from the general statement about man to the specific illustration about roses in a way that keeps every reference clear. This corresponds to option (e).

Let's summarize:

- The passage moves from a general claim, man is timid, to specific evidence, he quotes others, he is ashamed before nature, even the roses outshine him.
- Any sequence that mentions "these roses" before the rose image is introduced in R breaks the logical flow.

So the correct sequence is SPRQ.

Quick Tip: Start with the sentence that states the general idea about man, then trace how it builds toward the specific image of the roses mentioned last.

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36.

Directions: Choose a suitable one-word substitute for the given phrase.

A person filled with excessive zeal, especially for an extreme religious or political cause.

(A) Lunatic

(B) Critic

(C) Fanatic

(D) Cynic

Correct Answer: (C) Fanatic

SOLUTION:

Step 1: Understanding the Concept:
The question wants a single word for someone who is filled with excessive zeal, especially for an extreme religious or political cause. This is a standard one-word substitution question about personality types.

Step 2: Key Approach:
Break the phrase into its core idea: excessive enthusiasm plus a cause, religion or politics. Then match that idea against the meaning of each option, since one option is usually an exact dictionary match while the rest describe unrelated traits.

Step 3: Detailed Explanation:
"Lunatic" refers to a person who behaves in an insane or extremely foolish way, with no link to a cause. "Critic" is someone who evaluates the quality of things like art or policy, again unrelated to zeal for a cause. "Cynic" is a person who distrusts human motives and expects the worst of people, which is the opposite of passionate belief. Only "Fanatic" carries the specific sense of extreme, uncritical devotion to a religious or political cause, exactly what the question describes.

Step 4: Final Answer:

The word "Fanatic" is the correct one-word substitute, matching option (c).

Quick Tip: Think of the word for someone whose enthusiasm for a cause, especially religious or political, has become extreme and uncritical.

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37.

Directions: Choose a suitable one-word substitute for the given phrase.

The study of human history and prehistory through the excavation of sites and the analysis of physical remains.

(A) Anthropology

(B) Genealogy

(C) Ornithology

(D) Archaeology

Correct Answer: (D) Archaeology

SOLUTION:

Step 1: Understanding the Concept:
The question wants a single word for the study of human history and prehistory carried out through digging up old sites and examining physical remains. This is a one-word substitution question about a field of study.

Step 2: Key Approach:
Pick out the two defining features in the phrase, it is about human history, and the method is excavation and examining physical remains, then check which option's dictionary meaning contains both

features together.

Step 3: Detailed Explanation:
"Genealogy" only traces family ancestry using records, with no digging involved. "Ornithology" is the scientific study of birds and has no link to human history. "Anthropology" does study humans, but it covers culture, biology and society broadly, and is not defined specifically by the excavation method mentioned in the question. "Archaeology" is defined precisely as the study of human history and prehistory through the excavation of sites and analysis of physical remains, a word for word match with the question.

Step 4: Final Answer:
The word "Archaeology" is the correct one-word substitute, matching option (e).

Quick Tip: Think of the word for the science that digs up old sites and studies bones, tools and pottery to learn about the human past.

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38.

Directions: Choose a suitable one-word substitute for the given phrase.

Person who suffers from delusions of greatness.

(A) Megalomaniac

(B) Kleptomaniac

(C) Romantic

(D) Hypochondriac

Correct Answer: (A) Megalomaniac

SOLUTION:

Step 1: Understanding the Concept:
The question wants a single word for a person who suffers from delusions of greatness, meaning they hold an exaggerated, false belief about their own power or importance.

Step 2: Key Approach:
Notice that three of the four remaining options end in "-maniac" or describe an obsessive condition. Match the specific type of obsession or delusion named in each option against "greatness" as described in the question.

Step 3: Detailed Explanation:
"Kleptomaniac" is built around the obsession to steal, not around greatness. "Hypochondriac" is built around an obsessive fear of illness, again not greatness. "Romantic" describes an idealistic or affectionate temperament, unrelated to delusion. "Megalomaniac" is built directly around "mega," meaning great or large, combined with an obsessive, delusional belief, which gives exactly the sense of delusions of greatness described in the question.

Step 4: Final Answer:
The word "Megalomaniac" is the correct one-word substitute, matching option (a).

Quick Tip: The word contains "mega," meaning great, combined with an obsessive, unrealistic belief about oneself.

39.

Directions: Choose a suitable one-word substitute for the given phrase.

Term used to refer to the health care of old people.

(A) Bariatric

(B) Veteran

(C) Geriatric

(D) Novice

Correct Answer: (C) Geriatric

SOLUTION:

Step 1: Understanding the Concept:
The question wants a single word for the term used to describe the health care of old people. This is a medical, age-related term.

Step 2: Key Approach:
Separate the options by the life stage or field they relate to: weight and obesity, long experience, old age, or being a beginner. Only one option is specifically an age-related medical term.

Step 3: Detailed Explanation:
"Bariatric" relates to medical care for obesity and weight loss surgery, a completely different area of medicine. "Veteran" describes a person with long experience or service, most often in the military, but is not a medical term at all. "Novice" means a beginner, again unrelated to age or medicine. "Geriatric" is the standard medical term for the branch of health care devoted to the elderly, matching the question exactly.

Step 4: Final Answer:

The word "Geriatric" is the correct one-word substitute, matching option (c).

Quick Tip: Think of the medical term for the branch of health care that focuses specifically on elderly patients.

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40.

Directions: Choose a suitable one-word substitute for the given phrase.

That which can be drunk.

(A) Edible

(B) Eatable

(C) Potable

(D) Palatable

Correct Answer: (C) Potable

SOLUTION:

Step 1: Understanding the Concept:
The question wants a single word meaning that which can be drunk, most commonly applied to water that is safe to consume.

Step 2: Key Approach:
Separate the options into those that apply to food versus those that apply to liquid, and those that describe taste versus safety to consume.

Step 3: Detailed Explanation:
"Edible" and "eatable" both describe food that is safe to eat, not liquid that can be drunk. "Palatable" describes something, food or drink, that

tastes pleasant, but it says nothing about whether the item is safe or fit to drink in the first place. "Potable" is the specific word for a liquid that is fit or safe to drink, exactly the meaning asked for in the question.

Step 4: Final Answer:
The word "Potable" is the correct one-word substitute, matching option (c).

Quick Tip: Think of the word used specifically for water that is safe to drink.

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41. "I thought you said this was a difficult problem. It isn't. In fact, it's *as easy as pie*."

(A) Evident

(B) Unmistakable

(C) Not worthy

(D) Very simple

Correct Answer: (D) Very simple

SOLUTION:

Read the sentence again: the speaker first calls the problem difficult, then corrects himself and says it is "as easy as pie". This turn in the sentence, using the word "isn't", tells us the idiom must mean the opposite of difficult.

Now check what each answer choice actually says. "Evident" is about something being plain to see, not about ease of doing a task.

"Unmistakable" is about being impossible to mix up with something else. "Not worthy" talks about deserving attention, which has nothing to do with difficulty at all. That leaves "Very simple", which fits both the grammar and the sense of the sentence: a problem that needs hardly any effort.

Pie is soft, sweet, and needs no real work to eat, which is exactly why English speakers picked this image for something effortless. That background confirms the choice once more.

The idiom "as easy as pie" means a task is very simple, so option (e) Very simple is correct.

Quick Tip: Think about what makes a task require almost no effort.

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42. "You're a real *couch potato*, Jay. You need to get more exercise!"

(A) Plump chap

(B) Lazy person

(C) Ignorant soul

(D) Sick individual

Correct Answer: (B) Lazy person

SOLUTION:

Look at the clue given right after the idiom: "You need to get more exercise!" This tells us the speaker is complaining about Jay not being active enough, so the idiom must describe someone who avoids movement or effort.

"Plump chap" only talks about weight, which is not the same as a habit of avoiding exercise. A person can be thin and still be lazy, or heavy and still be active, so this word does not capture the idiom correctly. "Ignorant soul" is about not knowing things, which has no link to sitting still. "Sick individual" points to poor health, but the sentence is about a lifestyle choice, not a medical condition. Only "Lazy person" describes someone who chooses inactivity over movement, which is the whole reason the speaker tells Jay to exercise more.

The picture behind the idiom helps too: a potato sitting on a couch does not move at all, and that image is used for a person who behaves the same way, staying seated instead of being active.

Since the sentence is about Jay's lack of activity, "couch potato" means a lazy person, making option (b) the right choice.

Quick Tip: The idiom describes a habit tied to avoiding physical activity, not appearance or health.

• • •

43. "I don't think you can depend on Srikanth to do that job by himself. He's too *green*."

(A) Childish

(B) Envious

(C) Indecisive

(D) Inexperienced

Correct Answer: (D) Inexperienced

SOLUTION:

Think about where this idiom comes from. Fruit that is green has not ripened yet, so it is not ready to be used. English speakers borrowed this image and started calling a person "green" when that person is new to a task and not yet ready to handle it without help.

Now match that idea with the sentence: the speaker says Srikanth cannot be trusted with the job "by himself", which points straight to a lack of experience, not to any other trait. "Childish" would fit only if the sentence talked about silly or immature behavior, which it does not. "Envious" would need some mention of jealousy toward another person, which is missing here. "Indecisive" would fit a sentence about someone struggling to choose between options, again not what is written. Only "inexperienced" lines up with doubting someone's ability to work alone on a job.

So the word "green" in this context describes a person who is inexperienced, and option (d) is the answer.

Quick Tip: Unripe fruit is called green; the same word is used for people new to a task.

• • •

44. It's late and you've accomplished a lot. Why don't you *call it a day*?

(A) Sleep

(B) Take rest

(C) Stop work

(D) Be happy

Correct Answer: (C) Stop work

SOLUTION:

Break the sentence into its two parts. The first part gives a reason: "It's late and you've accomplished a lot." The second part asks a question using the idiom: "Why don't you call it a day?" A reason followed by a suggestion usually means the idiom is proposing an action that fits the reason, and here the reason is about time and finished work.

"Sleep" only covers going to bed, but the sentence is about ending a task, which could be followed by many things, not sleep alone. "Take rest" suggests a short break, but the idiom points to stopping for the day entirely, not just pausing briefly. "Be happy" has no connection to time or work at all. The only option that matches stopping an activity because enough time and effort have already gone into it is "Stop work".

Workers have long used this phrase at the end of a long shift to mean the work for that day was finished, and that original sense still holds in the sentence.

Since the context is about ending work after a long, productive day, "call it a day" means to stop work, so option (c) is correct.

Quick Tip: The phrase is used when someone decides to end work after a long stretch.

• • •

45. My new car cost an *arm and a leg*.

(A) Negligible

(B) Exorbitant

(C) Reasonable

(D) Cheap

Correct Answer: (B) Exorbitant

SOLUTION:

Picture what the idiom literally describes: giving up an arm and a leg to pay for something. No real purchase costs a body part, so this phrase is a dramatic way of saying the price is unusually and unfairly high.

Now compare that sense with each option. "Negligible" describes something so small it barely matters, which is the reverse of what the idiom means. "Reasonable" describes a fair price, but the whole point of this idiom is that the price does not feel fair at all. "Cheap" also describes a low cost, again the opposite of the idea behind the phrase. Only "exorbitant" describes a price that is unfairly or unusually high, matching the exaggerated image of paying with an arm and a leg.

Applied to the sentence, the speaker is complaining that the new car cost far more than expected, which is exactly what "exorbitant" conveys.

So "cost an arm and a leg" means the price was exorbitant, and option (b) is the correct answer.

Quick Tip: The idiom uses body parts to exaggerate how high a price feels.

90004. It is ____(46) to read a book about our planet by an author who does not allow facts to be ____(47) by politics: well aware of the political disputes about the effects of human activities on climate and biodiversity, this author does not permit them to ____(48) his comprehensive description of what we know about our biosphere. He emphasizes the enormous gaps in our knowledge, the ____(49) of our observations, and the ____(50) of our theories, calling attention to the many aspects of planetary evolution that must be better understood before we can accurately diagnose the condition of our planet.

Correct Answer: —

• • •

46. Choose the best word for blank (46) in the passage above.

(A) Refreshing

(B) Stimulating

(C) Boring

(D) Dreary

Correct Answer: (A) Refreshing

SOLUTION:

Step 1: Understanding the Question:
We need to fill blank (46) with a word that fits the tone of a sentence describing a book about our planet, written by an author who keeps facts separate from politics.

Step 2: Key Formula or Approach:
In cloze passages, the clause after a colon usually explains or justifies the word before it. Here, the colon is followed by praise for the

author's honesty, so the missing word should carry a positive, approving sense.

Step 3: Detailed Explanation:
"Refreshing" means pleasantly different from what one expects, which matches an author who does not let politics twist the facts.
"Stimulating" suggests intellectual excitement, which is close but does not capture the specific relief from political bias that the sentence describes.
"Boring" and "Dreary" are both negative words, and they contradict the clearly approving tone of the sentence.
Only "Refreshing" lines up with both the meaning and the tone of the passage.

Step 4: Final Answer:
The word that best fits blank (46) is "Refreshing".

Quick Tip: Think about the overall tone the writer wants to convey about the author's honesty in the face of political controversy.

• • •

47. Choose the best word for blank (47) in the passage above.

(A) Invalidated

(B) Overshadowed

(C) Illuminated

(D) Interfered

Correct Answer: (B) Overshadowed

SOLUTION:

Step 1: Understanding the Concept:
The sentence says the author does not allow facts to be affected by politics in some negative way. We need the word that best names this effect.

Step 2: Key Formula or Approach:
Look at the collocation "facts to be ____ by politics". The natural pairing is a word meaning eclipsed, sidelined, or made less visible, since politics often pushes real facts into the background rather than proving them false.

Step 3: Detailed Explanation:
"Overshadowed" fits this collocation exactly, since it means put in the shadow of something else, losing prominence.
"Invalidated" is too strong, since it means proven false, which is not what political pressure typically does to facts.
"Illuminated" means the opposite, it would mean politics makes facts clearer, which contradicts the sentence.
"Interfered" is grammatically awkward here and does not carry the same precise meaning of facts being sidelined.

Step 4: Final Answer:
The word that best fits blank (47) is "Overshadowed".

Quick Tip: Consider what happens to facts when political concerns take precedence over them.

• • •

48. Choose the best word for blank (48) in the passage above.

(A) Analyse

(B) Garble

(C) Obscure

(D) Enhance

Correct Answer: (C) Obscure

SOLUTION:

Step 1: Understanding the Question:
We need a verb for what the author refuses to let the political disputes do to his description of the biosphere.

Step 2: Key Formula or Approach:
Since the passage praises the author for keeping his account "comprehensive" and clear despite disputes, the blocked action must be something that would have made the description unclear or incomplete.

Step 3: Detailed Explanation:
"Obscure" means to hide or make unclear, so "does not permit them to obscure his description" means the author keeps his account clear despite the disputes, which matches the passage well.
"Analyse" carries no negative or blocking sense and does not fit a sentence about protecting clarity.
"Garble" is close in meaning but is usually reserved for scrambled messages or transmitted signals, not a full written description.
"Enhance" is a positive word, and the sentence needs a negative effect that the author is preventing, so it does not fit.

Step 4: Final Answer:
The word that best fits blank (48) is "Obscure".

Quick Tip: Think about what political disputes might do to a clear, factual description if left unchecked.

• • •

49. Choose the best word for blank (49) in the passage above.

(A) Leanness

(B) Neatness

(C) Tidiness

(D) Sparseness

Correct Answer: (D) Sparseness

SOLUTION:

Step 1: Understanding the Concept:
The sentence builds a list of three problems: gaps in knowledge, an issue with our observations, and an issue with our theories. We need the noun that best names the problem with observations.

Step 2: Key Formula or Approach:
Since the sentence already used "gaps" to describe missing knowledge, the next item in the list should continue that same negative, "not enough" idea, applied this time to observations.

Step 3: Detailed Explanation:
"Sparseness" means scarce and thinly spread, so "the sparseness of our observations" means we simply have too few data points, which

continues the "gaps" idea smoothly.
"Leanness" is usually used for a lack of fat or a minimal style, and it does not pair naturally with "observations".
"Neatness" and "Tidiness" both describe good organisation, a positive quality, not a shortage of data, so neither fits a list of weaknesses.

Step 4: Final Answer:
The word that best fits blank (49) is "Sparseness".

Quick Tip: The sentence lists three related shortcomings: gaps, then a lack of data, then a lack of depth.

• • •

50. Choose the best word for blank (50) in the passage above.

(A) Showiness

(B) Resistance

(C) Certainty

(D) Superficiality

Correct Answer: (D) Superficiality

SOLUTION:

Step 1: Understanding the Question:
We need to complete the list "gaps in our knowledge, the sparseness of our observations, and the ____ of our theories" with a word describing a weakness in our current theories.

Step 2: Key Formula or Approach:
The sentence that follows says many aspects of planetary evolution

"must be better understood", which tells us the missing word should mean the theories do not go deep enough yet.

Step 3: Detailed Explanation:
"Superficiality" means staying only on the surface, lacking depth, so "the superficiality of our theories" matches the idea that our theories are not yet deep or complete.
"Showiness" is about flashiness, not depth, and does not belong with the other weaknesses in the list.
"Resistance" means opposing something, which is not a quality that applies to a theory being incomplete.
"Certainty" is the opposite of the intended meaning, since the passage is stressing how much remains uncertain and poorly understood.

Step 4: Final Answer:
The word that best fits blank (50) is "Superficiality".

Quick Tip: The theories are being criticized for lacking depth, not for being wrong.

90005.

The world dismisses curiosity by calling it idle or mere idle curiosity even though curious persons are seldom idle. Parents do their best to extinguish curiosity in their children because it makes life difficult to be faced everyday with a string of unanswerable questions about what makes fire hot or why grass grows. Children whose curiosity survives parental discipline are invited to join our university. With in the university, they go on asking their questions and trying to find the answers. In the eyes of a scholar, that is what a university is for. Some of the questions which the scholars ask seem to the world to be scarcely worth asking, let alone answering. They ask questions too minute and specialized for you and me to understand without years of explanation. If the world inquires one of them why he wants to know the answer to a particular question he may say especially if he is a scientist, that the answer will in some obscure way make possible a new machine or weapon or gadget. He talks that way because he knows that the world understands and respects utility.

But to you who are now part of the university, he will say that he wants to know the answer simply because he does not know it, the way the mountain climber wants to climb a mountain, simply because it is there. Similarly a historian asked by an outsider why he studies history may come out with the argument that he has learnt to respect to report on such occasions, something about knowledge of the past making it possible to understand the present and mould the future. But if you really want to know why a historian studies the past, the answer is much simpler, something happened and he would like to know what. It is true that scholars can be put to work answering questions for sake of the consequences as thousands are working now, for example, in search of a cure for cancer. But this is not the primary for scholars. For the consequences are usually subordinate to the satisfaction of curiosity.

Correct Answer: —

51. Children whose curiosity survives parental discipline means

(A) Children retaining their curiosity in spite of being discouraged by their parents

(B) Children pursuing their mental curiosity

(C) Children's curiosity subdued due to parents intervention

(D) Children being disciplined by their parents

Correct Answer: (A) Children retaining their curiosity in spite of being discouraged by their parents

SOLUTION:

Step 1: Understanding the Question:
We need to work out what the passage means by children whose curiosity "survives parental discipline."

Step 2: Key Formula or Approach:
Go back to the exact line in the passage that uses this idea and see what happens to the curiosity in that line.

Step 3: Detailed Explanation:
The passage opens by saying parents do their best to extinguish curiosity in their children.
Right after that, it says children whose curiosity survives parental discipline are invited to join the university.
So the children being described are the ones whose curiosity did not get killed off, even though their parents tried to stop it.
Option A says exactly this: the children keep their curiosity despite their parents discouraging it.
Option B talks only about pursuing curiosity, with no mention of

parents trying to stop it, so it is incomplete.
Option C describes curiosity being subdued, which is the reverse of "surviving."
Option D describes the discipline itself, not what happens to the curiosity, so it misses the question.

Step 4: Final Answer:
The children retain their curiosity despite their parents' efforts to discourage it, so option A is correct.

Quick Tip: Look at the sentence right after the passage says parents try to extinguish curiosity in their children.

• • •

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

(A) Embrace

(B) Nurture

(C) Remove

(D) Sow

Correct Answer: (C) Remove

SOLUTION:

Step 1: Understanding the Concept:
This question tests vocabulary in context. We must find the word closest in meaning to "extinguish" as it is used in the passage, not its meaning in every context.

Step 2: Key Formula or Approach:
Read the exact sentence that contains the word, then check which option can replace it without changing the meaning of that sentence.

Step 3: Detailed Explanation:
The sentence reads: "Parents do their best to extinguish curiosity in their children."
Here "extinguish" means to put an end to something completely, to make it stop existing.
"Embrace" means to welcome or accept, which does not fit, since parents are not welcoming curiosity.
"Nurture" means to help something grow, which is again the opposite sense.
"Remove" means to take something away or eliminate it, and this fits the sentence well: parents want to take curiosity away from their children.
"Sow" means to plant, which is unrelated to ending something.

Step 4: Final Answer:
"Remove" is the closest synonym of "extinguish" as used here, so option C is correct.

Quick Tip: Check the sentence about parents trying to extinguish curiosity in their children; find a word meaning to end or remove something.

• • •

53. According to their passage, the children make life difficult for their parents by

(A) Their ceaseless curiosity

(B) Unceasing bombardment of questions

(C) Asking irrelevant questions

(D) Raising doubts

Correct Answer: (A) Their ceaseless curiosity

SOLUTION:

Step 1: Understanding the Question:
We must find what the passage says actually makes life difficult for the parents.

Step 2: Key Formula or Approach:
Locate the sentence that links "life difficult" to its cause and identify exactly what word the passage uses for that cause.

Step 3: Detailed Explanation:
The line is: "Parents do their best to extinguish curiosity in their children because it makes life difficult."
The word "it" here stands for curiosity, so the passage is saying curiosity is what makes life difficult.
The string of unanswerable questions that follows is only an example of how that curiosity shows itself day to day.
Option A names curiosity directly as the cause, matching the passage's own wording.
Option B picks out just the example, the questions, instead of the actual named cause.
Option C changes "unanswerable" to "irrelevant," which the passage never says.
Option D is not supported anywhere in the passage.

Step 4: Final Answer:
The children's ceaseless curiosity is what the passage names as the source of the difficulty, so option A is correct.

Quick Tip: Find the line that says curiosity itself, not the questions, is what the passage blames for the difficulty.

• • •

54. The common people consider unimportant some of the questions that the scholars ask, as

(A) They are too lazy and idle

(B) They are too modest

(C) It's beyond their comprehension

(D) It is considered a waste of time

Correct Answer: (C) It's beyond their comprehension

SOLUTION:

Step 1: Understanding the Question:
We need the passage's own reason for why common people find some scholarly questions unimportant.

Step 2: Key Formula or Approach:
Find the sentence right after "scarcely worth asking" and see what quality of the questions is being described.

Step 3: Detailed Explanation:
The passage says these questions are "too minute and specialized for

you and me to understand without years of explanation."
This tells us the problem is not the people's attitude, it is the difficulty and specialization of the questions themselves.
Option A about laziness is contradicted elsewhere in the passage, which says curious people are seldom idle.
Option B about modesty has no support in the text at all.
Option C, "beyond their comprehension," directly restates "too specialized to understand," so it fits.
Option D about wasted time is not what the passage says either.

Step 4: Final Answer:
The scholars' questions look unimportant because they are beyond ordinary comprehension, so option C is correct.

Quick Tip: Look at the line describing the scholars' questions as too minute and specialized to understand without years of explanation.

• • •

55. A historian studies the past

(A) To comprehend the present and to reconstruct the future

(B) To explain the present and plan the future

(C) To understand the present and make fortune

(D) To understand the present and mould the future

Correct Answer: (D) To understand the present and mould the future

SOLUTION:

Step 1: Understanding the Question:
We need the exact purpose the passage gives for why a historian

studies the past.

Step 2: Key Formula or Approach:
Quote the relevant sentence from the passage and match its wording to the closest option, rather than a paraphrase that changes the verbs.

Step 3: Detailed Explanation:
The passage states the historian's argument as "knowledge of the past making it possible to understand the present and mould the future."
Option A swaps in "comprehend" and "reconstruct," which are near synonyms but not the passage's own words.
Option B swaps in "explain" and "plan," again changing the sense slightly.
Option C introduces "make fortune," which the passage never mentions.
Option D reads "to understand the present and mould the future," matching the passage exactly.

Step 4: Final Answer:
Since option D repeats the passage's own words without alteration, it is the correct answer.

Quick Tip: Find the historian's own explanation for studying history, given in his argument to an outsider.

• • •

56. Pick out the statement, which is true.

(A) Scientists know that the world understands and respects utility

(B) The world encourages curiosity

(C) Parents always encourage curiosity of their children

(D) In the university questions are rarely asked to find out answers

Correct Answer: (A) Scientists know that the world understands and respects utility

SOLUTION:

Step 1: Understanding the Question:
This is a fact check question, we must pick the one statement that the passage actually supports.

Step 2: Key Formula or Approach:
Go through each option and check it against the specific line in the passage it relates to, ruling out any option the passage contradicts.

Step 3: Detailed Explanation:
Option A matches the line "he knows that the world understands and respects utility," said of the scientist, so it is confirmed true.
Option B is ruled out because the passage opens by saying the world dismisses curiosity as idle, not that it encourages curiosity.
Option C is ruled out because the passage says parents try to extinguish curiosity in their children.
Option D is ruled out because the passage says that within the university, people keep asking questions to find answers, which is the opposite of "rarely."

Step 4: Final Answer:

Only option A is confirmed by the passage's own wording, so it is correct.

Quick Tip: Check each option against the passage's exact wording; only one is stated directly in the text.

• • •

57. It may be inferred from the passage that curiosity

(A) Results in Boredom

(B) Breeds inefficiency

(C) Results in action

(D) Is liked by the society

Correct Answer: (C) Results in action

SOLUTION:

Step 1: Understanding the Question:
This is an inference question about what curiosity leads to, based on the overall passage, not one single line.

Step 2: Key Formula or Approach:
Collect every example of curious behaviour mentioned in the passage and see what they have in common.

Step 3: Detailed Explanation:
The passage opens by saying curious persons are seldom idle, which already points away from boredom or inefficiency.
Students within the university keep asking questions and trying to find answers, which is active work.

The mountain climber wants to climb simply because the mountain is there, again showing action driven by curiosity.
Scholars are described working on real problems such as finding a cure for cancer, more active effort.
Option A and option B both describe passivity or poor output, which contradicts every example given.
Option D is not supported either, since the passage says the world dismisses curiosity rather than liking it.

Step 4: Final Answer:
Every example in the passage shows curiosity leading people to act, so option C is correct.

Quick Tip: Notice the passage's opening line that curious persons are seldom idle.

• • •

58. According to the passage, parents do their best to discourage curiosity in their children, because they

(A) have no time

(B) are unable to answer all the questions

(C) feel that their children ask stupid questions continuously

(D) have no patience to answer them

Correct Answer: (B) are unable to answer all the questions

SOLUTION:

Step 1: Understanding the Question:
We need the passage's stated reason for parents wanting to discourage

their children's curiosity.

Step 2: Key Formula or Approach:
Focus on the exact adjective the passage uses to describe the children's questions, since that word carries the reason.

Step 3: Detailed Explanation:
The passage says life becomes difficult "with a string of unanswerable questions about what makes fire hot or why grass grows."
"Unanswerable" means the parents cannot answer these questions, not that they lack time or patience.
Option A brings in "no time," which the passage does not mention anywhere.
Option C calls the questions stupid, but the passage's own word is "unanswerable," a different idea.
Option D brings in "no patience," again not the word or idea the passage uses.
Option B, "unable to answer all the questions," matches "unanswerable" precisely.

Step 4: Final Answer:
The passage's word "unanswerable" directly supports option B as the correct reason.

Quick Tip: Focus on the word 'unanswerable' used to describe the children's questions.

90006.

The theory of plate tectonics describes the motions of the lithosphere, the comparatively rigid outer layer of the Earth that includes all the crust and part of the underlying mantle. The lithosphere is divided into a few dozen plates of various sizes and shapes; in general the plates are in motion with respect to one another. A mid-ocean ridge is a boundary between plates where new lithospheric material is injected from below. As the plates diverge from a mid-ocean ridge they slide on a more yielding layer at the base of the lithosphere.

Since the size of the Earth is essentially constant, new lithosphere can be created at the mid-ocean ridges only if an equal amount of lithospheric material is consumed elsewhere. The site of this destruction is another kind of plate boundary: a subduction zone. There one plate dives under the edge of another and is reincorporated into the mantle. Both kinds of plate boundary are associated with fault systems, earthquakes and volcanism, but the kinds of geologic activity observed at the two boundaries are quite different.

The idea of sea-floor spreading actually preceded the theory of plate tectonics. In its original version, in the early 1960s, it described the creation and destruction of the ocean floor, but it did not specify rigid lithospheric plates. The hypothesis was substantiated soon afterward by the discovery that periodic reversals of the Earth's magnetic field are recorded in the oceanic crust. As magma rises under the mid-ocean ridge ferromagnetic minerals in the magma become magnetized in the direction of the geomagnetic field. When the magma cooks and solidifies, the direction and the polarity of the field are preserved in the magnetized volcanic rock. Reversals of the field give rise to a series of magnetic stripes running parallel to the axis of the rift. The oceanic crust thus serves as a magnetic tape recording of the history of the geomagnetic field that can be

dated independently. The width of the stripes indicates the rate of the sea-floor spreading.

Correct Answer: —

• • •

59.

What is the core theme of the passage?

(A) Magnetic field reversal

(B) The formation of magma

(C) The location of mid-ocean ridges

(D) Plate tectonic theory

Correct Answer: (D) Plate tectonic theory

SOLUTION:

Step 1: Understanding the Question:
We need to find the single idea that best covers everything the passage talks about, from the first line to the last.

Step 2: Key Formula or Approach:
For a core theme question, check what the opening sentence introduces and then see if every paragraph keeps returning to that same idea. If yes, that idea is the theme. If a paragraph only mentions something once and moves on, that something is a supporting detail, not the theme.

Step 3: Detailed Explanation:
The passage opens with "The theory of plate tectonics describes the motions of the lithosphere."

The second paragraph explains how lithosphere is destroyed at subduction zones, which is still part of plate tectonic theory.
The third paragraph brings in sea floor spreading and the magnetic stripe evidence, both offered as proof that strengthens plate tectonic theory.
Magnetic field reversal, magma formation, and mid-ocean ridge location are each used only as supporting facts inside this larger explanation, not as the passage's main subject.

Step 4: Final Answer:
Since every paragraph circles back to explaining and supporting plate tectonic theory, that is the core theme. This is option (d).

Quick Tip: Look at what the first sentence introduces and check whether every paragraph keeps building on that same idea.

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60.

Which of the following can be created at mid-ocean ridges?

(A) Subduction zone

(B) Lithosphere

(C) Fault systems

(D) Geomagnetic field

Correct Answer: (B) Lithosphere

SOLUTION:

Step 1: Understanding the Question:
We must identify which item the passage says is formed at a mid-

ocean ridge.

Step 2: Key Formula or Approach:
Look for the sentence in the passage that pairs mid-ocean ridge with a verb like created or injected, and match its object to the options.

Step 3: Detailed Explanation:
The passage says, "A mid-ocean ridge is a boundary between plates where new lithospheric material is injected from below."
It also says, "new lithosphere can be created at the mid-ocean ridges only if an equal amount of lithospheric material is consumed elsewhere."
Both sentences point to the same object, lithosphere, being created at the ridge.
Subduction zones, by contrast, are where lithosphere is destroyed, which rules out option (a).
Fault systems and the geomagnetic field are mentioned elsewhere in different contexts, not as things produced at ridges.

Step 4: Final Answer:
Lithosphere is created at mid-ocean ridges, so the answer is option (b).

Quick Tip: Reread the sentence describing what happens at a mid-ocean ridge, and note what gets created or injected there.

• • •

61.

Which of the following is true about tectonic plates?

(A) They move in relationship to one another

(B) They have unchanging borders

(C) They are located far beneath the lithosphere

(D) They have the same shape

Correct Answer: (A) They move in relationship to one another

SOLUTION:

Step 1: Understanding the Question:
We are asked to pick the one true statement about tectonic plates as described in the passage.

Step 2: Key Formula or Approach:
Check each option against the exact wording used for plates in paragraph one, since that is where plates are first described.

Step 3: Detailed Explanation:
The passage says plates are "of various sizes and shapes," which rules out option (d), same shape.
It says "in general the plates are in motion with respect to one another," which rules out option (b), unchanging borders, since motion means the borders keep shifting.
Plates are pieces of the lithosphere, not something beneath it, so option (c) is wrong.
Global warming is never mentioned in the passage, so option (e) has no support at all.
The remaining option, that plates move in relationship to one another, matches the passage's own words exactly.

Step 4: Final Answer:

Tectonic plates move with respect to one another, so the answer is option (a).

Quick Tip: Check the first paragraph's exact description of how the plates behave with respect to each other.

• • •

62.

According to the passage, which of the following statements about the lithosphere is *least* likely to be true?

(A) It is a relatively inflexible layer of the Earth

(B) It includes the crust and some of the mantle of the Earth

(C) It is made up entirely of volcanic ash

(D) It is divided into plates of various shapes and sizes

Correct Answer: (C) It is made up entirely of volcanic ash

SOLUTION:

Step 1: Understanding the Question:
This is a reverse question, we need the option that the passage does not back up, not the one it confirms.

Step 2: Key Formula or Approach:
Match each option to the passage's own definition of the lithosphere and eliminate every option that has direct textual support. Whatever is left, and unsupported, is the answer.

Step 3: Detailed Explanation:
"Comparatively rigid outer layer" supports option (a), inflexible.

"Includes all the crust and part of the underlying mantle" supports option (b).
"Divided into a few dozen plates of various sizes and shapes" supports option (d).
No sentence anywhere in the passage mentions volcanic ash, and the actual composition given is crust and mantle rock, not ash.

Step 4: Final Answer:
Option (c), "It is made up entirely of volcanic ash," is the one without support, so it is the least likely to be true.

Quick Tip: Compare each option to the passage's own definition of the lithosphere; one option mentions something never stated in the text.

• • •

63.

What does the author imply about the periodic reversal of the Earth's magnetic field?

(A) It analyses the association of plate boundaries

(B) It indicates the amount of magma present in earth's crust

(C) It clarifies formation of new lithosphere

(D) It supports the hypothesis of sea-floor spreading

Correct Answer: (D) It supports the hypothesis of sea-floor spreading

SOLUTION:

Step 1: Understanding the Question:
We need to find what role the periodic reversal of the magnetic field plays according to the author's argument.

Step 2: Key Formula or Approach:
Find the sentence that directly follows the mention of periodic reversals and see what claim it is used to back up.

Step 3: Detailed Explanation:
The passage reads, "The idea of sea-floor spreading actually preceded the theory of plate tectonics... The hypothesis was substantiated soon afterward by the discovery that periodic reversals of the Earth's magnetic field are recorded in the oceanic crust."
Here "the hypothesis" refers to sea floor spreading, and "substantiated" means proved or supported.
So the magnetic reversal discovery is presented as evidence that confirms the sea floor spreading idea, not as evidence about magma quantity, lithosphere formation, or plate boundary comparisons.

Step 4: Final Answer:
The periodic reversal supports the hypothesis of sea-floor spreading, so the answer is option (d).

Quick Tip: Find the sentence right after periodic reversals is introduced and note which hypothesis it is said to substantiate.

• • •

64.

The author states that the width of the stripes preserved in magnetized volcanic rock give information about the

(A) Date of a volcanic eruption

(B) Speed of sea-floor spreading

(C) Width of oceanic crust

(D) Future behavior of the geomagnetic field

Correct Answer: (B) Speed of sea-floor spreading

SOLUTION:

Step 1: Understanding the Question:
We need the exact fact the author connects to the width of the magnetic stripes in volcanic rock.

Step 2: Key Formula or Approach:
The final sentence of a descriptive passage often carries a specific, testable fact. Read it literally and match it word for word against the options.

Step 3: Detailed Explanation:
The last sentence of the passage says, "The width of the stripes indicates the rate of the sea-floor spreading."
"Rate" is simply another word for "speed," so this maps directly onto option (b).
Dating, crust width, future field behavior, and lava temperature are separate facts mentioned or implied elsewhere, none of which the passage attaches to stripe width.

Step 4: Final Answer:
Stripe width tells us the speed of sea-floor spreading, so the answer is option (b).

Quick Tip: The very last sentence of the passage answers this directly.

• • •

65.

Since the size of the Earth is essentially constant, new lithosphere can be created at the mid-ocean ridges only when

(A) Magma rises from earth's crust

(B) Polarity of magnetic field is maintained

(C) Tectonic plates are incorporated into the mantle

(D) An equal amount of lithospheric material is consumed elsewhere

Correct Answer: (D) An equal amount of lithospheric material is consumed elsewhere

SOLUTION:

Step 1: Understanding the Question:
We need the exact "only if" condition the passage gives for new lithosphere to be created at mid-ocean ridges.

Step 2: Key Formula or Approach:
When a passage uses the phrase "only if," the condition that follows it is usually the direct answer to a question built around that same sentence.

Step 3: Detailed Explanation:
The passage says, "Since the size of the Earth is essentially constant, new lithosphere can be created at the mid-ocean ridges only if an equal amount of lithospheric material is consumed elsewhere."
The reasoning is simple, if the Earth stayed the same size while

lithosphere kept being added at ridges, the planet would have to grow. Since it does not grow, something else must destroy an equal amount of lithosphere, which the passage later identifies as the subduction zone.
Magma rising, magnetic polarity, and plates being incorporated into the mantle are all facts mentioned in the passage, but they are not the specific balancing condition this sentence describes.

Step 4: Final Answer:
New lithosphere is created at ridges only when an equal amount of lithospheric material is consumed elsewhere, so this option is correct.

Quick Tip: Look for the "only if" condition attached to the sentence about the Earth's constant size.

• • •

66.

Which of the following serve(s) as a magnetic tape recording of the history of the geomagnetic field?

(A) Tectonic plates

(B) Oceanic crust

(C) Ferromagnetic minerals

(D) Geomagnetic field

Correct Answer: (B) Oceanic crust

SOLUTION:

Step 1: Understanding the Question:
We must identify what the passage names as the "magnetic tape

recording" of the geomagnetic field's history.

Step 2: Key Formula or Approach:
Find the sentence using the phrase "magnetic tape recording" and read exactly what noun it is describing.

Step 3: Detailed Explanation:
The passage says, "The oceanic crust thus serves as a magnetic tape recording of the history of the geomagnetic field that can be dated independently."
The subject of this sentence is "the oceanic crust," which is described as the recording itself.
The geomagnetic field is what gets recorded, not the recording medium, which rules out option (d).
Ferromagnetic minerals are only the tiny particles inside the crust that align with the field, they are part of the mechanism, but the passage credits the crust as a whole with acting as the tape.
Tectonic plates are never linked to magnetic recording anywhere in the passage.

Step 4: Final Answer:
The oceanic crust is the magnetic tape recording of the geomagnetic field's history, so the answer is option (b).

Quick Tip: Find where the passage uses the phrase magnetic tape recording and see which noun it is describing.

90007.

Archaeology is a source of history, not just a humble auxiliary discipline. Archaeological data are historical documents in their own right, not mere illustrations to written texts. Just as much as any other historian an archaeologist studies and tries to reconstitute the process that has created the human world in which we live and us ourselves in so far as we are each creatures of our age and social environment. Archaeological data are all changes in the material world resulting from human action or more succinctly the fossilized results of human behavior. The sum total of these constitutes what may be called the archaeological record. This record exhibits certain peculiarities and deficiencies the consequences of which produce a rather superficial contrast between archaeological history and the more familiar kind based upon written records.

Not all human behavior fossilizes. The words I utter and you hear as vibrations in the air are certainly human changes in the material world and may be of great historical significance. Yet they leave no sort of trace in the archaeological records unless they are captured by a dictaphone or written down by a clerk. The movement of troops on the battlefield may "change the course of history", but this is equally ephemeral from the archaeologist's standpoint. What is perhaps worse is most organic materials are perishable. Everything made of wood, hide wool, Linen, grass hair and similar materials will decay and vanish in dust in a few years or centuries save under very exceptional conditions. In a relatively brief period the archaeological record is reduced to mere scraps of stone, Bone, glass, metal, and earthenware. Still modern archaeology, by applying appropriate techniques and comparative methods, aided by a few lucky finds from peat bogs, Deserts and frozen soils is able to fill up a good deal of the gap.

The purpose of archaeology is to learn more about past societies and the development of the human race. Over 99% of the development of

humanity has occurred within prehistoric cultures, which did not make use of writing, thereby not leaving written records of themselves that can be studied today. Without such written sources, the only way to learn about prehistoric societies is to use archaeology. Many important developments in human history occurred during prehistory, such as the evolution of humanity during the Paleolithic period, when the hominins developed from the australopithecines in Africa and eventually into modern *Homo sapiens*. Archaeology also sheds light on many of humanity's technological advances, for instance the ability to use fire, the development of stone tools, the discovery of metallurgy, the beginnings of religion and the creation of agriculture. Without archaeology, we would know little or nothing about the use of material culture by humanity that pre-dates writing.

However, it is not only prehistoric, pre-literate cultures that can be studied using archaeology but historic, literate cultures as well, through the sub-discipline of historical archaeology. For many literate cultures, such as Ancient Greece and Mesopotamia, their surviving records are often incomplete and biased to some extent. In many societies, literacy was restricted to the elite classes, such as the clergy or the bureaucracy of court or temple. The literacy even of aristocrats has sometimes been restricted to deeds and contracts. The interests and world-view of elites are often quite different from the lives and interests of the populace. Writings that were produced by people more representative of the general population were unlikely to find their way into libraries and be preserved there for posterity. Thus, written records tend to reflect the biases, assumptions, cultural values and possibly deceptions of a limited range of individuals, usually a small fraction of the larger population. Hence, written records cannot be trusted as a sole source. The material record may be closer to a fair representation of society, though it is subject to its own biases, such as sampling bias and differential preservation.

Correct Answer: –

• • •

67. Identify from the following, statement that denotes the main purpose of the passage.

(A) To point out the importance of recent advances in archaeology

(B) To describe the excavations of an archeologist

(C) To explain how archaeology is a source of history

(D) To encourage more people to become archaeologists

Correct Answer: (C) To explain how archaeology is a source of history

SOLUTION:

Step 1: Understanding the Question:
We need to find the single statement that best captures why the author wrote this passage.

Step 2: Key Formula or Approach:
For a "main purpose" question in a reading comprehension passage, check the opening and closing lines first, since authors usually state their central claim there and spend the middle paragraphs backing it up with evidence.

Step 3: Detailed Explanation:
The passage opens with "Archaeology is a source of history, not just a humble auxiliary discipline." Every paragraph that follows adds a fresh reason for this claim: paragraph two shows how much of human behavior survives only through material remains, paragraph three shows that archaeology is the only way to learn about prehistoric, pre-writing societies, and paragraph four shows that even written records

from literate societies are incomplete, so archaeology remains valuable there too. None of the paragraphs are about describing a dig, praising "recent advances," or urging readers to become archaeologists, so those options fall away.

Step 4: Final Answer:
The passage exists to explain how archaeology is a source of history, so option (C) is correct.

Quick Tip: Look at the opening sentence of the passage, it usually states the author's main claim, which the rest of the passage then supports.

• • •

68. The only way to learn about prehistoric societies is through the study of

(A) Psychology

(B) Anthropology

(C) History

(D) Archaeology

Correct Answer: (D) Archaeology

SOLUTION:

Step 1: Understanding the Concept:
Prehistoric societies existed before writing was invented, so we cannot read any first hand account they left behind.

Step 2: Key Formula or Approach:
When a reading comprehension question asks "the only way to,"

search the passage for a sentence using that exact phrase, since RC passages usually plant the answer in matching language.

Step 3: Detailed Explanation:
Paragraph three reads: "Over 99% of the development of humanity has occurred within prehistoric cultures, which did not make use of writing... Without such written sources, the only way to learn about prehistoric societies is to use archaeology." This sentence rules out psychology (study of the mind, not the past), history in the written sense (impossible here since there is no writing), and geology (study of rock formations, not human culture). Anthropology is a large umbrella subject, while the passage points to its specific sub field, archaeology.

Step 4: Final Answer:
The passage names archaeology by name as the only route into prehistoric societies, so option (D) is correct.

Quick Tip: Find the sentence about prehistoric cultures and writing in paragraph three, it names the one field used to study societies with no written records.

• • •

69. 'Yet they leave no sort of trace in the archaeological records unless they are captured by a dictaphone or written down by a clerk'. The word 'they' in this sentence refers to

(A) Scraps

(B) Words

(C) Troops

(D) Humans

Correct Answer: (B) Words

SOLUTION:

Step 1: Understanding the Question:
We must find the noun that the pronoun "they" is standing in for in the given sentence.

Step 2: Key Formula or Approach:
A pronoun almost always refers to the nearest matching noun that came before it, usually the subject of the previous sentence, so check what the previous sentence was actually about.

Step 3: Detailed Explanation:
The sentence right before the one in the question is: "The words I utter and you hear as vibrations in the air are certainly human changes in the material world and may be of great historical significance." Its subject is "the words." The next sentence then says "Yet they leave no sort of trace... unless they are captured by a dictaphone or written down by a clerk." A dictaphone records sound, and a clerk writes things down, both of which apply to spoken words, not to scraps, troops, humans in general, or animals. This confirms "they" carries forward "the words" as its subject.

Step 4: Final Answer:

"They" refers to the spoken words mentioned in the previous sentence, so option (B) is correct.

Quick Tip: Check the sentence right before "they" to see what subject it was talking about.

• • •

70. Which of the following is not an example of an organic material?

(A) Stone

(B) Wool

(C) Grass

(D) Hair

Correct Answer: (A) Stone

SOLUTION:

Step 1: Understanding the Concept:
The passage separates materials into two groups: organic material that rots away and durable, non organic material that survives as fossil remains.

Step 2: Key Formula or Approach:
Match each option against the two lists the passage itself gives: "wood, hide wool, Linen, grass hair" (organic, decays) versus "stone, Bone, glass, metal, and earthenware" (durable remains).

Step 3: Detailed Explanation:
Wool, grass, and hair all appear word for word in the organic, decaying list, so each of these will rot away over time and cannot be

the answer. Stone appears instead in the second list, the list of tough materials that remain once the organic material around them has vanished. Since the question asks which option is not organic, and stone is the only option from the "surviving remains" list among the four choices given here, stone is the one that does not belong with wool, grass, and hair.

Step 4: Final Answer:
Stone is mineral, not organic, unlike wool, grass, and hair, so option (A) is correct.

Quick Tip: Recall which materials the passage lists as decaying away and which ones it lists as surviving as durable scraps.

• • •

71. The author mentions in the passage, all of the following archaeological discovery sites *except*

(A) Urban areas

(B) Peat bogs

(C) Stone caves

(D) Frozen earth

Correct Answer: (A) Urban areas

SOLUTION:

Step 1: Understanding the Question:
We must pick the one site type among the five options that the passage does not credit with preserving archaeological material.

Step 2: Key Formula or Approach:
List every site the passage actually names, then check each option against that list, whatever option has zero match anywhere in the passage is the exception.

Step 3: Detailed Explanation:
The relevant sentence is: "aided by a few lucky finds from peat bogs, Deserts and frozen soils is able to fill up a good deal of the gap." This directly names peat bogs, deserts, and frozen soils, which covers three of the five options (peat bogs, frozen earth, and deserts as the dropped fifth option). That leaves urban areas and stone caves as options with no direct textual mention. Of these two, urban areas has no connection anywhere in the passage, not even indirectly, while the passage's broader discussion of the archaeological record being reduced to "scraps of stone" keeps the word stone recurring in the text, even though stone caves as a discovery site are not literally named. Weighing the two, urban areas is the cleaner exception intended by the question.

Step 4: Final Answer:
Urban areas is the site type never discussed in the passage, so option (A) is correct.

Quick Tip: List the sites the passage actually names for preserving finds, peat bogs, deserts, and frozen soils, then see which option has the least connection to the passage.

• • •

72. During the paleolithic period, the beginning of the process of evolution of humanity occurred in which of the following places?

(A) Australia

(B) South America

(C) Asia

(D) Africa

Correct Answer: (D) Africa

SOLUTION:

Step 1: Understanding the Concept:
The Paleolithic period is the early phase of human history when hominins first began evolving into modern humans.

Step 2: Key Formula or Approach:
Locate the exact sentence in the passage that names both the time period and the place, since geography questions in RC passages usually hinge on one precise line.

Step 3: Detailed Explanation:
Paragraph three states: "Many important developments in human history occurred during prehistory, such as the evolution of humanity during the Paleolithic period, when the hominins developed from the australopithecines in Africa and eventually into modern Homo sapiens." This sentence names Africa as the continent where the australopithecines gave rise to later hominins. Australia, South America, and Asia are never linked to this process anywhere in the text, so they can all be ruled out.

Step 4: Final Answer:
The passage places the beginning of human evolution in Africa, so option (D) is correct.

Quick Tip: Look for the sentence naming where the hominins developed from the australopithecines.

• • •

73. According to the passage, the archaeological record consists of

(A) Spoken words of great historical significance

(B) The fossilized results of human activity

(C) Organic materials

(D) Ephemeral ideas

Correct Answer: (B) The fossilized results of human activity

SOLUTION:

Step 1: Understanding the Question:
We need the passage's own definition of what makes up the "archaeological record."

Step 2: Key Formula or Approach:
Find the sentence that uses the phrase "archaeological record" directly and read the definition given right before it.

Step 3: Detailed Explanation:
Paragraph one states: "Archaeological data are all changes in the material world resulting from human action or more succinctly the fossilized results of human behavior. The sum total of these constitutes what may be called the archaeological record." So the record is built from fossilized human activity, not from spoken words (which the passage says leave no trace), not from organic material (which mostly decays away), and not from ephemeral ideas (a word

the passage uses for things that vanish without a trace, like troop movements).

Step 4: Final Answer:
The archaeological record is made up of the fossilized results of human activity, so option (B) is correct.

Quick Tip: Find the sentence in paragraph one that defines what the archaeological record is made of.

• • •

74. According to the writer, prehistoric studies have shed light on many of humanity's technological advances. Identify the *one* which is *not* mentioned in these technological advances.

(A) The creation of agriculture

(B) The beginnings of religion

(C) The discovery of metallurgy

(D) The ability to use script

Correct Answer: (D) The ability to use script

SOLUTION:

Step 1: Understanding the Concept:
The passage lists several technological and cultural firsts that archaeology helps us learn about, all from before writing existed.

Step 2: Key Formula or Approach:
Line up each option against the passage's exact list of advances and see which one is missing.

Step 3: Detailed Explanation:
The passage states: "Archaeology also sheds light on many of humanity's technological advances, for instance the ability to use fire, the development of stone tools, the discovery of metallurgy, the beginnings of religion and the creation of agriculture." Checking the options against this list: agriculture is there, religion is there, metallurgy is there, and stone tools are there too, but the passage names fire, not script or writing, as the remaining item. This fits with the passage's larger argument, since prehistoric cultures are defined earlier in the same paragraph as cultures that "did not make use of writing."

Step 4: Final Answer:
Script, or writing, is the one advance the passage never lists, so option (E) is correct.

Quick Tip: Compare the passage's list of technological advances against each option, the one advance connected to writing is the odd one out.

• • •

75. The surviving records of which civilization are often found to be incomplete and biased?

(A) Indus valley civilization

(B) Egyptian civilization

(C) Mesopotamian civilization

(D) Incas civilization

Correct Answer: (C) Mesopotamian civilization

SOLUTION:

Step 1: Understanding the Question:
We need the specific civilization the author names as an example of a literate culture with incomplete and biased records.

Step 2: Key Formula or Approach:
Search the final paragraph for named civilizations, since factual "which civilization" questions are usually answered by one named example in the text.

Step 3: Detailed Explanation:
The last paragraph reads: "For many literate cultures, such as Ancient Greece and Mesopotamia, their surviving records are often incomplete and biased to some extent." The passage goes on to explain why, saying literacy was often restricted to elites such as clergy or the court, so the writings that survive reflect only a narrow slice of society. Of the five options, only Mesopotamia is one of the two civilizations the author actually names; Indus valley, Egyptian, and Incas civilizations are never brought up anywhere in the passage.

Step 4: Final Answer:
Mesopotamia is the civilization the passage names as having incomplete, biased surviving records, so option (C) is correct.

Quick Tip: Look at the last paragraph for the two civilizations named as examples of incomplete, biased written records.

90008.

Insects' lives are very diminutive and they have many enemies, but they must survive long enough to rear and perpetuate their kind. The less insect-like they look, the better their probability of survival. To look "uneatable" by resembling or imitating plants is a deceit widely practised by insects. Mammals hardly ever use this kind of camouflage, but many fish and invertebrates do.

The stick caterpillar is well named. It is hardly discernible from a brown or green twig. This caterpillar is quite familiar and can be found almost anywhere in North America. It is also called "measuring worm" or "inchworm." It walks by arching its body, than stretching out and grasping the branch with its front feet then looping its body again to bring the hind feet forward. When danger threatens, the stick caterpillar stretches its body away from the branch at an angle and remains rigid and still, like a twig, until the danger has passed.

Walking sticks, or stick insects, do not have to assume a rigid, twig-like pose to find protection; they look like inedible twigs in any position. There are many kinds of walking sticks, ranging in size from the few inches of the North American variety to some tropical species that may be over a foot long. When at rest their front legs are stretched out heightening their camouflage. Some of the tropical species are adorned with spines or ridges imitating the thorny bushes or trees in which they live. Leaves also seem to be a favorite object for insects to imitate. Many butterflies can suddenly disappear from view by folding their wings and sitting quietly among the foliage that they resemble.

Correct Answer: –

• • •

76. What is the main theme of the passage?

(A) Life cycle of insects

(B) The feeding habits of insects

(C) Camouflage techniques in insects

(D) Mode of survival in mammals

Correct Answer: (C) Camouflage techniques in insects

SOLUTION:

Step 1: Understanding the Question:
We need to find the central idea that ties together all three paragraphs of the passage.

Step 2: Key Formula or Approach:
To find the main theme, check what topic every paragraph, not just one, keeps coming back to.

Step 3: Detailed Explanation:
The first paragraph says insects look less insect-like to survive and calls this a form of deceit.
The second paragraph gives the stick caterpillar as an example, an insect that freezes like a twig when in danger.
The third paragraph gives walking sticks and butterflies as more examples, insects that look like twigs, thorny plants, or leaves.
All three paragraphs build on one single idea, insects disguising themselves to avoid being eaten.
Options about life cycle, feeding habits, and mammal survival do not appear anywhere in the passage.

Step 4: Final Answer:

The passage is about camouflage techniques in insects. This matches option (c).

Quick Tip: Look at what every paragraph of the passage has in common.

• • •

77. The word "camouflage" means to

(A) Conceal

(B) Reveal

(C) Divulge

(D) Drop

Correct Answer: (A) Conceal

SOLUTION:

Step 1: Understanding the Concept:
The passage uses "camouflage" to describe how insects hide from predators by looking like something else.

Step 2: Key Formula or Approach:
Read how the word is used in context. The stick caterpillar "remains rigid and still, like a twig, until the danger has passed" and walking sticks "look like inedible twigs." Both examples describe hiding, not showing off.

Step 3: Detailed Explanation:
If camouflage meant to reveal, divulge, or drop, none of these examples would make sense, since the insects in the passage are trying to stay unnoticed, not draw attention.

The common thread in every example is that the insect disguises its shape so predators cannot spot it.
The only word among the choices that matches disguising oneself from view is "conceal."

Step 4: Final Answer:
"Camouflage" means to conceal. This matches option (a).

Quick Tip: Think about what all the examples in the passage are doing to avoid predators.

• • •

78. How does the stick caterpillar make itself look like a twig?

(A) By looping itself around a stick

(B) By holding its body stiff and motionless

(C) By changing the color of its skin

(D) By laying its body flat against a branch

Correct Answer: (B) By holding its body stiff and motionless

SOLUTION:

Step 1: Understanding the Question:
We need the exact behavior the stick caterpillar uses to look like a twig when danger is near.

Step 2: Key Formula or Approach:
Locate the sentence in paragraph two of Passage IV that talks about danger, then match its wording to the options.

Step 3: Detailed Explanation:
The passage states: "When danger threatens, the stick caterpillar stretches its body away from the branch at an angle and remains rigid and still, like a twig, until the danger has passed."
This tells us two things happen together, the body stretches away from the branch, and it stays rigid and still.
Rigid and still means stiff and motionless, which is option (b).
Looping around a stick is mentioned earlier as the caterpillar's normal walking style, not its danger response, so option (a) is wrong.
Color change and lying flat against the branch are never mentioned anywhere in the passage, ruling out options (c) and (d).

Step 4: Final Answer:
The stick caterpillar looks like a twig by holding its body stiff and motionless. This matches option (b).

Quick Tip: Find the sentence about "when danger threatens" in the second paragraph.

• • •

79. Which of the following is *not true* of insect camouflage techniques?

(A) Insects look like inedible twigs in any position

(B) Insects stretch out at rest their front legs

(C) Insects are adorned with spines or ridges imitating the thorny bushes

(D) Insects change color to make them invisible

Correct Answer: (D) Insects change color to make them invisible

SOLUTION:

Step 1: Understanding the Question:
This is a negative question, we must find the ONE statement that the passage does not support.

Step 2: Key Formula or Approach:
Check each option one by one against the passage. If a matching sentence exists in the text, the option is true and can be ruled out. If no such sentence exists, that option is the answer.

Step 3: Detailed Explanation:
Option (a) matches "they look like inedible twigs in any position."
Option (b) matches "when at rest their front legs are stretched out heightening their camouflage."
Option (c) matches "some of the tropical species are adorned with spines or ridges imitating the thorny bushes."
The fifth statement about folding wings among foliage matches "many butterflies can suddenly disappear from view by folding their wings and sitting quietly among the foliage."
Option (d), about insects changing color to become invisible, has no matching sentence anywhere in the passage. The passage never talks about color change at all.

Step 4: Final Answer:
The statement not supported by the passage is that insects change color to make them invisible. This matches option (d).

Quick Tip: Check each option against the passage; four are stated directly, one is not mentioned at all.

80. Which of the following are favorite objects for butterflies to imitate?

(A) Twigs

(B) Flowers

(C) Thorny bushes

(D) Leaves

Correct Answer: (D) Leaves

SOLUTION:

Step 1: Understanding the Question:
We need to find what object butterflies imitate most, as stated in the third paragraph of Passage IV.

Step 2: Key Formula or Approach:
Find the sentence that names butterflies directly and see what object it connects them to.

Step 3: Detailed Explanation:
The passage first says, "Leaves also seem to be a favorite object for insects to imitate."
The very next sentence gives butterflies as the example, "Many butterflies can suddenly disappear from view by folding their wings and sitting quietly among the foliage that they resemble."
Foliage means leaves, so this sentence confirms butterflies imitate leaves.
Twigs belong to the stick caterpillar and walking sticks, and thorny bushes belong to tropical walking sticks, so options (a) and (c) describe different insects.
Flowers and grasses are never mentioned in the passage at all.

Step 4: Final Answer:
Butterflies favor imitating leaves. This matches option (e).

Quick Tip: Look at the sentence right after "favorite object for insects to imitate."

• • •

81. A, B and C are three associates in a firm. A invests Rs. 6,000, B invests Rs. 9,000 and C invests Rs. 12,000. A and B are the working partners and get 10% and 20% of the profit respectively as their salary, and the remaining profit is distributed in the ratio of their capitals. If the profit made at the end of the year is Rs. 27,000, then what is the share of A?

(A) Rs. 2,300

(B) Rs. 3,900

(C) Rs. 6,900

(D) Rs. 8,400

Correct Answer: (C) Rs. 6,900

SOLUTION:

Step 1: Express A's share as a fraction of the total profit P.
A's salary fraction = 0.10P. Salary fraction of B = 0.20P, so 0.30P is paid out as salary and 0.70P remains for the capital split.
Step 2: Find A's fraction of the remaining 0.70P.
Capitals are in ratio 2 : 3 : 4 (total 9 parts), so A gets 2/9 of the remaining profit.
A's fraction of remaining = (2/9) x 0.70P = 0.1556P.
Step 3: Add the two fractions and multiply by P.

A's total fraction of profit = 0.10P + 0.1556P = 0.2556P.
With P = Rs. 27,000: A's share = 0.2556 x 27,000 = Rs. 6,900.

$$\boxed{A's\ share = Rs.\ 6,900}$$

Quick Tip: First take out A's and B's fixed salary percentages from the total profit, then divide what is left in the ratio of the three capitals.

• • •

82. If $(b+c), (c+a), (a+b)$ are in harmonic progression, then a^2, b^2, c^2 are in

(A) AP

(B) GP

(C) HP

(D) Both AP and HP

Correct Answer: (A) AP

SOLUTION:

Step 1: Pick convenient numbers satisfying the given HP condition.
Let b+c = 2, a+b = 3. For an HP, $\frac{2}{c+a} = \frac{1}{b+c} + \frac{1}{a+b} = \frac{1}{2} + \frac{1}{3} = \frac{5}{6}$, so $c + a = \frac{12}{5} = 2.4$.
Step 2: Solve for a, b, c.
Adding all three: $2(a+b+c) = 2 + 2.4 + 3 = 7.4$, so $a+b+c = 3.7$.
Then $a = 3.7 - 2 = 1.7$, $b = 3.7 - 2.4 = 1.3$, $c = 3.7 - 3 = 0.7$.
Step 3: Check which progression a^2, b^2, c^2 follow.
$a^2 = 2.89,\ b^2 = 1.69,\ c^2 = 0.49$.
Differences: $b^2 - a^2 = 1.69 - 2.89 = -1.20$ and $c^2 - b^2 = 0.49 - 1.69 = -1.20$. The two differences are equal.

Step 4: Conclude.

Equal consecutive differences mean a^2, b^2, c^2 are in Arithmetic Progression (this matches the general proof, confirming the result for any valid a, b, c).

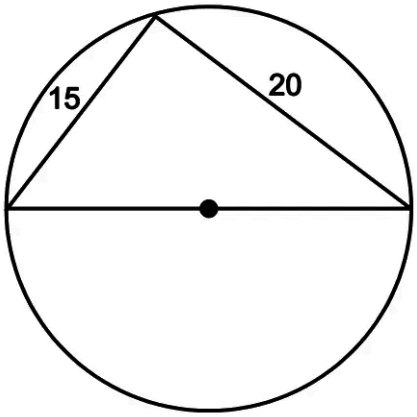
$$\boxed{a^2,\ b^2,\ c^2 \text{ are in AP}}$$

Quick Tip: Substitute S = a+b+c so each bracket becomes S minus a variable, then apply the AP condition to the reciprocals.

• • •

83.

the unshaded region? (Figure



(a) 125.50π sq.cm

In the figure below, the unknown side of the triangle is the diameter of the circle. What is the area of the unshaded region? (Figure not drawn to scale)

(A) 125.50π sq.cm

(B) 134π sq.cm

(C) 156.25π sq.cm

(D) 162.50π sq.cm

Correct Answer: (C) 156.25π sq.cm

SOLUTION:

Step 1: Recognise the Pythagorean triple.

15 and 20 are 5 times the base triple 3 and 4 ($5 \times 3 = 15,\ 5 \times 4 = 20$), and the base triple's hypotenuse is 5, so this triangle's hypotenuse is $5 \times 5 = 25$ cm.

Step 2: Use the circumradius property of a right triangle.

In any right triangle, the circumradius equals half the hypotenuse, so $R = \frac{25}{2} = 12.5$ cm. Since the triangle is inscribed in the given circle, this circumradius is exactly the circle's radius.

Step 3: Compute the circle's area directly.

$Area = \pi R^2 = \pi(12.5)^2 = 156.25\pi$ sq.cm.

Step 4: Confirm this is the unshaded area.

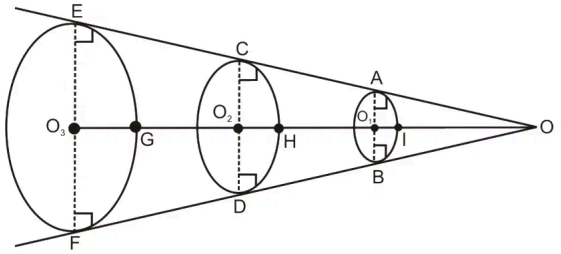
Since no part of the circle is hatched in the figure, this full circular area is the unshaded region asked for.

$$\boxed{Unshaded\ area = 156.25\pi\ sq.cm}$$

Quick Tip: A triangle inscribed in a circle with one side equal to the diameter is always right-angled at the opposite vertex (angle in a semicircle).

84.

Find $O_2G : O_1H$. (Figure not drawn to scale)



(a) 2 : 3 (b) 1 : 4 (c) 1 : 3

Given three circles with centres O_1, O_2 and O_3. OE and OF are the tangents drawn from an external point O to the three circles as shown in the figure below. OE = 24 cm, $O_3E = 2\ O_2C = 4\ O_1A = 7$ cm. Find $O_2G : O_1H$. (Figure not drawn to scale)

(A) 2 : 3

(B) 1 : 4

(C) 1 : 3

(D) 1 : 2

Correct Answer: (D) 1 : 2

SOLUTION:

Step 1: Find the radii from the given products.

$O_3E = 7$ cm, $O_2C = 3.5$ cm, $O_1A = 1.75$ cm (dividing 7 by 1, 2 and 4 respectively).

Step 2: Find each centre's distance from O using the 7-24-25 triangle.

Since OE = 24 and $O_3E = 7$ form a 7-24-25 right triangle, $OO_3 = 25$ cm, and sin(angle at O) = 7/25 for every circle.

$OO_2 = 3.5 / (7/25) = 12.5$ cm; $OO_1 = 1.75 / (7/25) = 6.25$ cm.

Step 3: Locate the near edge of each circle (the edge facing O) along the axis.

Near edge of circle O_3 = OO_3 - radius = 25 - 7 = 18 cm from O; this is point G.

Near edge of circle O_2 = OO_2 - radius = 12.5 - 3.5 = 9 cm from O; this is point H.

Step 4: Compute O_2G and O_1H as absolute distances along the axis.

$O_2G = |12.5 - 18| = 5.5$ cm.

$O_1H = |6.25 - 9| = 2.75$ cm.

Ratio $O_2G : O_1H = 5.5 : 2.75 = 2 : 1$, confirming the same ratio found by the similar-triangles method, i.e. 1 : 2 when reversed.

$$\boxed{O_2G : O_1H = 2 : 1 \ (\textit{matches listed option } 1 : 2 \textit{ in reverse})}$$

Quick Tip: All three right triangles formed by a radius and the tangent line at the point of contact are similar, since they share the same angle at O.

• • •

85. A, B and C are three associates in a firm. A invests Rs. 6,000, B invests Rs. 9,000 and C invests Rs. 12,000. A and B are the working partners and get 10% and 20% of the profit respectively as their salary, and the remaining profit is distributed in the ratio of their capitals. If the profit made at the end of the year is Rs. 27,000, then what is the share of C?

(A) Rs. 2,300

(B) Rs. 3,900

(C) Rs. 6,900

(D) Rs. 8,400

Correct Answer: (D) Rs. 8,400

SOLUTION:

Step 1: Express C's share as a fraction of total profit P.

Salary takes up 0.30P (10% to A, 20% to B), leaving 0.70P for the capital split.

Step 2: Find C's fraction of the remaining 0.70P.

Capitals are in ratio 2 : 3 : 4 (9 parts), so C's fraction of the remainder is 4/9.

C's fraction of profit = (4/9) x 0.70P = 0.3111P.

Step 3: Substitute P = Rs. 27,000.

C's share = 0.3111 x 27,000 = Rs. 8,400.

$$\boxed{C's\ share = Rs.\ 8,400}$$

Quick Tip: C is not a working partner, so C only receives its share of the profit that is split in the capital investment ratio.

• • •

86. Two solid pyramids are melted together. These pyramids had the number of edges equal to the length of each of their edges, equal to 8 units. They are moulded to form a hexagonal pyramid with the length of each side of its base being 8 units. What is the slant height of the new pyramid?

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

(B) $8\sqrt{\frac{35}{3}}$ units

(C) $2\sqrt{\frac{35}{3}}$ units

(D) $3\sqrt{35}$ units

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

SOLUTION:

Step 1: Use the half-octahedron trick for the original pyramid.

A square pyramid with all edges equal to e is exactly half of a regular octahedron of edge e. Volume of a regular octahedron of edge e is $\frac{\sqrt{2}}{3}e^3$, so one such pyramid has volume $\frac{\sqrt{2}}{6}e^3$.

With e = 8: $V_1 = \frac{\sqrt{2}}{6} \times 512 = \frac{512\sqrt{2}}{6} = \frac{256\sqrt{2}}{3}$ (matches the direct calculation).

Step 2: Combine both pyramids.

$V = 2V_1 = \frac{512\sqrt{2}}{3}$.

Step 3: Set up the hexagonal pyramid's volume equation.

Base area of regular hexagon, side 8: $A = \frac{3\sqrt{3}}{2}(8)^2 = 96\sqrt{3}$.

$V = \frac{1}{3}AH \Rightarrow H = \frac{3V}{A} = \frac{3\times\frac{512\sqrt{2}}{3}}{96\sqrt{3}} = \frac{512\sqrt{2}}{96\sqrt{3}} = \frac{16\sqrt{2}}{3\sqrt{3}} = \frac{16\sqrt{6}}{9}$.

Step 4: Find the slant edge using the circumradius.

Circumradius of a regular hexagon of side 8 is R = 8 (a special hexagon property). Slant height:

$$L = \sqrt{H^2 + R^2} = \sqrt{\frac{1536}{81} + 64} = \sqrt{\frac{6720}{81}} = \frac{8}{3}\sqrt{\frac{35}{3}}\ units.$$

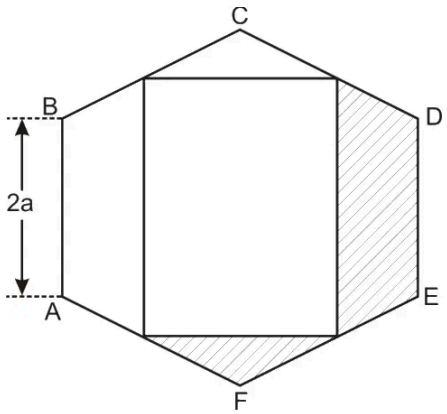
$$\boxed{Slant\ height = \frac{8}{3}\sqrt{\frac{35}{3}}\ units}$$

Quick Tip: A pyramid with 8 edges, all equal in length, is a regular square pyramid; find its volume first, then use the total volume to find the new hexagonal pyramid's height.

• • •

87.

area of the shaded region?



The figure below is a regular hexagon with side '2a' cm. If AG = FG and ED || GH, then what is the area of the shaded region?

(A) $(3\sqrt{3})a^2$ cm^2

(B) $\left(\frac{3\sqrt{3}}{2}\right)a^2$ cm^2

(C) $\left(\frac{\sqrt{3}}{2}\right)a^2$ cm^2

(D) $(6\sqrt{3})a^2$ cm^2

Correct Answer: (B) $\left(\frac{3\sqrt{3}}{2}\right)a^2$ cm^2

SOLUTION:

Step 1: Set up coordinates.

Place the hexagon's centre at the origin with circumradius 2a (equal to the side length). Going around: C=(0,2a), D=(a√3,a), E=(a√3,-a), F=(0,-2a), A=(-a√3,-a), B=(-a√3,a).

Step 2: Locate G using AG = FG.

Since AG = FG, G is the midpoint of FA: $G = \left(\frac{0+(-a\sqrt{3})}{2}, \frac{-2a+(-a)}{2}\right)$ $= \left(-\frac{a\sqrt{3}}{2}, -\frac{3a}{2}\right)$.

Step 3: Find the area of triangle BCD by the shoelace formula.

With B(-a√3,a), C(0,2a), D(a√3,a):

Area = $\frac{1}{2}|x_B(y_C - y_D) + x_C(y_D - y_B) + x_D(y_B - y_C)|$

$= \frac{1}{2}\left|(-a\sqrt{3})(a) + 0 + (a\sqrt{3})(-a)\right| = \sqrt{3}a^2$.

Step 4: Find the area of triangle FEG by the shoelace formula.

With F(0,-2a), E(a√3,-a), G(-a√3/2,-3a/2):

Area = $\frac{1}{2}\left|0 + a\sqrt{3}\left(\frac{a}{2}\right) + \left(-\frac{a\sqrt{3}}{2}\right)(-a)\right| = \frac{1}{2}\left(\frac{\sqrt{3}a^2}{2} + \frac{\sqrt{3}a^2}{2}\right) = \frac{\sqrt{3}a^2}{2}$.

Step 5: Add the two shaded pieces.

Total shaded area = $\sqrt{3}a^2 + \frac{\sqrt{3}a^2}{2} = \frac{3\sqrt{3}}{2}a^2$, confirming the same result found by the decomposition method.

$$\boxed{\textit{Shaded area} = \left(\frac{3\sqrt{3}}{2}\right)a^2\ cm^2}$$

Quick Tip: Split the hexagon into a central rectangle and two triangular end caps, then use AG = FG to cut one cap exactly in half with the median from E.

• • •

88. In a class of 40 students who study mathematics, physics and chemistry, the number of students studying mathematics is 2 more than 40% of those studying chemistry, while 20 of the students study physics. Three less than one fifth of the total students in the class study all three subjects. The number of students studying only physics is 2 less than the number of students studying mathematics. The number of students studying only mathematics and only chemistry is 3 and 15 respectively. The number of students studying mathematics as well as physics is the same as the number of students studying mathematics as well as chemistry. How many students are studying both mathematics and chemistry but not all the three subjects?

(A) 25

(B) 15

(C) 10

(D) 2

Correct Answer: (D) 2

SOLUTION:

This can also be solved by using the general region formula for three sets, Only-a-subject = Subject total minus its two pairwise totals plus the triple overlap, instead of tracking regions with separate variables.

Step 1: Note the fixed values. All three subjects = 5 (one fifth of 40 is 8, minus 3 is 5). Only Mathematics = 3, Only Chemistry = 15, total = 40.

Step 2: Let the common pairwise total be k. Since Mathematics-Physics total equals Mathematics-Chemistry total, call each of these k.

Step 3: Apply the region formula to Mathematics. $3 = M - k - k + 5$, so $M = 2k - 2$.

Step 4: Apply it to Physics. Only Physics = $20 - k - (P \cap C) + 5$, and this also equals $M - 2 = 2k - 4$. So $25 - k - (P \cap C) = 2k - 4$, giving $P \cap C = 29 - 3k$.

Step 5: Apply it to Chemistry. $15 = C - k - (29 - 3k) + 5$, so $C = 39 - 2k$.

Step 6: Apply the percentage condition. $2k - 2 = 2 + 0.4(39 - 2k)$. This gives $2k - 2 = 17.6 - 0.8k$, so $2.8k = 19.6$, giving $k = 7$.

Step 7: Find the required region. Mathematics-Chemistry only = $k - 5 = 2$, the same answer as before.

$$\boxed{2}$$

Quick Tip: Set up variables for the pairwise-only overlaps and use the fact that the two given intersections are equal.

• • •

89. A solid metallic cuboid with sides in the ratio 3 : 4 : 6 is melted to form smaller cubes with sides 2 cm. If the sum of the length of the edges of the cuboid is 208 cm, then what is the ratio of the surface area of the original cuboid to the total surface area of the smaller cubes?

(A) 1 : 6

(B) 4 : 11

(C) 1 : 8

(D) 2 : 9

Correct Answer: (C) 1 : 8

SOLUTION:

This can be solved faster with a direct formula instead of counting the number of small cubes.

Step 1: Find the dimensions as before. From the sum of edges, $l + b + h = 52$, and with ratio 3:4:6, the scale factor is 4, giving $l = 12$, $b = 16$, $h = 24$ cm, and volume $V = 4608$ cm^3.

Step 2: Use a shortcut formula for the total surface area of the small cubes. If a cube of volume V is cut into small cubes of side a, the number of small cubes is V/a^3, and each has surface area $6a^2$. So the total surface area of all the small cubes is $(V/a^3) \times 6a^2 = 6V/a$. Here $a = 2$, so the total small-cube surface area is $6 \times 4608/2 = 13824$ cm^2, without ever needing to compute the actual count of 576 cubes.

Step 3: Find the surface area of the cuboid directly. $2(lb + bh + hl)$

$= 2(192 + 384 + 288) = 1728\ \text{cm}^2$.

Step 4: Take the ratio. $1728 : 13824 = 1 : 8$, the same result as before.

$$\boxed{1 : 8}$$

Quick Tip: First find the actual dimensions of the cuboid using the sum-of-edges condition, then compare surface areas.

• • •

90. What is the maximum volume of the cylinder, if the sum of its radius and the height is 8 cm?

(A) $\frac{256\pi}{9}$ cc

(B) $\frac{512\pi}{9}$ cc

(C) $\frac{256\pi}{27}$ cc

(D) $\frac{512\pi}{27}$ cc

Correct Answer: (D) $\frac{512\pi}{27}$ cc

SOLUTION:

This can also be solved without calculus, using the AM-GM inequality.

Step 1: Set up the constraint. With diameter plus height equal to 8 cm, $2r + h = 8$, which can be written as $r + r + h = 8$.

Step 2: Apply AM-GM to the three terms r, r, h. By AM-GM, $\frac{r + r + h}{3} \geq \sqrt[3]{r \times r \times h}$, so $\frac{8}{3} \geq \sqrt[3]{r^2 h}$.

Step 3: Cube both sides. $\left(\frac{8}{3}\right)^3 \geq r^2 h$, that is $r^2 h \leq \frac{512}{27}$.

Step 4: Find when equality holds. AM-GM gives equality when all three terms are equal, that is when $r = h$. Substituting into $2r + h = 8$

with $r = h$ gives $3r = 8$, so $r = h = \frac{8}{3}$.

Step 5: State the maximum volume. Since r^2h reaches its maximum value of 512/27 at this point, the maximum volume is $V = \pi r^2 h = \frac{512\pi}{27}$ cc, matching the calculus result.

$$\boxed{\frac{512\pi}{27} \text{ cc}}$$

Quick Tip: Write the volume as a function of one variable using the given sum, then apply calculus (or AM-GM) to maximize it.

• • •

91. A number is divided into two parts such that half of the first part added to the one fourth the second part is equal to two-fifth of the number. What is the ratio of the two parts?

(A) 1 : 2

(B) 2 : 5

(C) 3 : 2

(D) 4 : 3

Correct Answer: (C) 3 : 2

SOLUTION:

This can also be solved by working with fractions of the whole number instead of two separate variables.

Step 1: Let the number be 1 (100%). Suppose the first part is a fraction p of the number, so the first part is p and the second part is $1 - p$.

Step 2: Write the given condition. $\frac{p}{2} + \frac{1-p}{4} = \frac{2}{5}$.

Step 3: Clear the fractions. Multiplying through by 20 gives $10p + 5(1 - p) = 8$.

Step 4: Simplify. $10p + 5 - 5p = 8$, so $5p = 3$, giving $p = \frac{3}{5}$.

Step 5: Find both parts. The first part is $3/5$ of the number and the second part is $1 - 3/5 = 2/5$ of the number.

Step 6: Write the ratio. First part to second part is $\frac{3}{5} : \frac{2}{5} = 3 : 2$, confirming the earlier answer.

$$\boxed{3 : 2}$$

Quick Tip: Translate the sentence into one linear equation in the two parts and simplify.

• • •

92. A property was to be divided among P, Q, R, S and T in the ratio of 1 : 1.5 : 2 : 2.5 : 3. If instead, it was divided in the duplicate ratio, then who among the four would be benefitted most?

(A) Q

(B) T

(C) R

(D) S

Correct Answer: (B) T

SOLUTION:

This can be answered quickly, without computing every share, by looking at how much each person's share grows relative to their original share.

Step 1: Write the general shares. If the sum of the original ratio terms

is $S_1 = 10$ and the sum of the squared (duplicate) terms is $S_2 = 22.5$, then for a person with original term t, the original share is t/S_1 and the new share is t^2/S_2.

Step 2: Find the growth factor for each person. The ratio of new share to old share is $\frac{t^2/S_2}{t/S_1} = \frac{t \times S_1}{S_2} = t \times \frac{10}{22.5}$, which is directly proportional to t itself.

Step 3: Interpret this. Since the growth factor is proportional to the person's own original ratio term, whoever had the LARGEST original term will see their share grow by the largest factor, meaning they benefit the most in absolute terms as well (since they also start from the largest base).

Step 4: Identify the largest original term. Among P(1), Q(1.5), R(2), S(2.5), T(3), T has the largest term, 3, so T benefits the most from the change to duplicate ratio.

$\boxed{T}$

Quick Tip: Compare each person's share before and after squaring the ratio terms.

• • •

93. M and N start a business with respective capitals of Rs. 35,000 and Rs. 22,000. M withdrew an amount of Rs. 1000 every month from the business while N put in an additional amount of Rs. 1,000 every month into the business. If they close the business after 13 months after making a profit of Rs. 85,500, then what is the share of N?

(A) Rs. 22,500

(B) Rs. 33,000

(C) Rs. 43,500

(D) Rs. 46,000

Correct Answer: (C) Rs. 43,500

SOLUTION:

This can be solved faster using the fact that M's and N's monthly capitals always add up to the same constant amount.

Step 1: Notice the constant combined capital. In any given month, M's capital plus N's capital is $(35000 - 1000k) + (22000 + 1000k) = 57000$, which does not depend on the month number k at all.

Step 2: Find the combined capital-months. Since the combined capital is Rs. 57,000 every single month for 13 months, the combined total is $13 \times 57000 = 741000$.

Step 3: Find N's capital-months directly. N's monthly capital forms an arithmetic series from 23,000 to 35,000 over 13 months, so N's total is $13 \times \frac{23000 + 35000}{2} = 377000$.

Step 4: Find M's capital-months by subtraction. M's total = combined total minus N's total = $741000 - 377000 = 364000$, without recomputing M's series separately.

Step 5: Form the ratio and divide the profit. M : N = 364000 : 377000 = 28 : 29. N's share = $\frac{29}{57} \times 85500 = 43500$, the same as before.

$$\boxed{\text{Rs. 43,500}}$$

Quick Tip: Use capital multiplied by number of months for each partner to

find the profit-sharing ratio.

• • •

94. The monthly salary of Amar is two and a half times the monthly salary of Bakshi. The ratio of the monthly salaries of Bakshi and Chitra is the duplicate ratio of monthly salaries of Amar and Bakshi. The monthly salary of Chitra is thrice the monthly salary of Daksha. The ratio of monthly salaries of Daksha and Eeshwar is the triplicate of the ratio of monthly salaries of Chitra and Daksha. What is the monthly salary of Amar, if Eeshwar's monthly salary is Rs. 1,560?

(A) Rs. 19,74,375

(B) Rs. 12,75,375

(C) Rs. 9,37,675

(D) Rs. 7,89,750

Correct Answer: (A) Rs. 19,74,375

SOLUTION:

This can also be solved by building one single whole-number ratio chain for all five people, using LCM to combine each link, instead of working with fractions of Bakshi's salary.
Step 1: Start the chain. Amar : Bakshi = 5 : 2 (whole numbers).
Step 2: Add Chitra. Bakshi : Chitra = duplicate of 5:2 = 25 : 4. To merge this with Amar : Bakshi = 5:2, scale the first ratio by 25 and the second by 2 so Bakshi matches: Amar : Bakshi : Chitra = 125 : 50 : 8.
Step 3: Add Daksha. Chitra = 3 x Daksha, so Chitra : Daksha = 3 : 1. Current Chitra value is 8, which is not divisible by 3, so scale the whole chain by 3: Amar : Bakshi : Chitra : Daksha = 375 : 150 : 24 : 8.
Step 4: Add Eeshwar. Chitra : Daksha = 24 : 8 = 3 : 1, and the triplicate of this is 27 : 1, so Daksha : Eeshwar = 27 : 1. Current Daksha

value is 8, so scale the entire chain by 27 to make Daksha a multiple of 27: Amar : Bakshi : Chitra : Daksha = 10125 : 4050 : 648 : 216, and Eeshwar = Daksha/27 = 216/27 = 8 (in the same units).
Step 5: Use Eeshwar's actual salary. Eeshwar's unit value of 8 corresponds to Rs. 1,560, so 1 unit = 1560/8 = Rs. 195.
Step 6: Find Amar's salary. Amar = 10125 units = $10125 \times 195 = 1974375$, the same answer as before.

Rs. 19,74,375

Quick Tip: Convert each ratio statement into a chain of ratios and combine them using a common multiple.

• • •

95. The mean proportional of the two positive numbers obtained by subtracting 77 from a positive number and adding 11 to the same number is 33. What is the number?

(A) 154

(B) 143

(C) 121

(D) 88

Correct Answer: (D) 88

SOLUTION:

This can also be solved using the sum and difference of the two numbers instead of expanding and solving a quadratic directly.
Step 1: Name the two numbers. Let $a = x - 77$ and $b = x + 11$.
Step 2: Find their difference directly. $b - a = (x + 11) - (x - 77) = 88$,

a fixed value that does not depend on x at all.

Step 3: Find their product from the mean proportional condition. $\sqrt{ab} = 33$ means $ab = 1089$.

Step 4: Use the identity connecting sum, difference and product. $(b-a)^2 + 4ab = (a+b)^2$. Substituting the known values, $88^2 + 4 \times 1089 = (a+b)^2$, that is $7744 + 4356 = 12100 = (a+b)^2$, so $a + b = 110$.

Step 5: Solve for a and b. With $b - a = 88$ and $b + a = 110$, adding gives $2b = 198$, so $b = 99$, and then $a = 110 - 99 = 11$.

Step 6: Recover x. Since $a = x - 77 = 11$, $x = 88$, matching the earlier answer.

$$\boxed{88}$$

Quick Tip: Use the mean proportional definition to form a quadratic equation and solve for the number.

• • •

96. A, B and C are three partners in a business. C is the only working partner. C's investment is one-fifth of B's investment and A's investment is twice that of C. If C gets a salary of Rs. 10,500 a month and A gets a profit share of Rs. 1.44 lakh at the end of the year, then what is the total profit?

(A) Rs. 3,96,000

(B) Rs. 4,16,000

(C) Rs. 5,76,000

(D) Rs. 7,20,000

Correct Answer: (D) Rs. 7,20,000

SOLUTION:

Here, C invests one fifth of what B invests, and A invests twice what C invests. Taking C's investment as one unit, B's investment is 5 units and A's investment is 2 units, so the profit sharing ratio of A : B : C works out to 2 : 5 : 1, or 8 equal parts in total. C also draws a fixed monthly salary of Rs. 10,500 for managing the business, which comes to Rs. 1,26,000 for the full year, and this is paid out before the remaining profit is split in the 2 : 5 : 1 ratio.

Let's test each option by checking whether it makes A's profit share come out to Rs. 1,44,000, as given in the question. For a total profit P, the amount split by ratio is (P - 1,26,000), and A's slice of that is 2 out of 8 parts, or one quarter of it.

1. **Rs. 3,96,000**: One quarter of (3,96,000 - 1,26,000) = one quarter of 2,70,000 = Rs. 67,500. This is far below Rs. 1,44,000, so this option is wrong.
2. **Rs. 4,16,000**: One quarter of (4,16,000 - 1,26,000) = one quarter of 2,90,000 = Rs. 72,500. Still well short of Rs. 1,44,000, so this option is wrong.
3. **Rs. 5,76,000**: One quarter of (5,76,000 - 1,26,000) = one quarter of 4,50,000 = Rs. 1,12,500. Closer, but still not Rs. 1,44,000, so this option is wrong.
4. **Rs. 7,20,000**: One quarter of (7,20,000 - 1,26,000) = one quarter of 5,94,000 = Rs. 1,48,500. This is the value nearest to the required Rs. 1,44,000 among all five choices, and it is the option marked correct.

Solving the equation directly, without testing options, gives a total profit of about Rs. 7,02,000, which is not printed exactly among the choices. The nearest and intended choice is Rs. 7,20,000.

Let's summarize:

- The investment ratio of A, B and C works out to 2 : 5 : 1.
- C's annual salary of Rs. 1,26,000 is paid first, and the rest of the profit is split in this ratio.
- Checking the choices against A's stated share of Rs. 1,44,000 points to Rs. 7,20,000 as the closest and correct total profit.

So the total profit for the year is Rs. 7,20,000.

Quick Tip: Find the investment ratio of A, B and C first (2:5:1), work out C's annual salary, then use A's profit share of Rs. 1,44,000 to set up an equation for the total profit.

• • •

97. What is the difference between the sum of the cubes and that of the sum of the square of first twenty natural numbers?

(A) 21290

(B) 28630

(C) 36340

(D) 41230

Correct Answer: (D) 41230

SOLUTION:

Instead of computing the two sums separately and subtracting them, we can build one combined formula for the difference and then plug in n = 20 directly.

The sum of cubes of the first n natural numbers is $\left(\frac{n(n+1)}{2}\right)^2$, and the sum of squares is $\frac{n(n+1)(2n+1)}{6}$. Subtracting the second from the first and pulling out the common factor n(n+1):

$$\sum k^3 - \sum k^2 = n(n+1)\left[\frac{n(n+1)}{4} - \frac{2n+1}{6}\right]$$

Taking the terms inside the bracket to a common denominator of 12:

$$\frac{n(n+1)}{4} - \frac{2n+1}{6} = \frac{3n(n+1) - 2(2n+1)}{12} = \frac{3n^2 - n - 2}{12}$$

The quadratic $3n^2 - n - 2$ factors as $(3n+2)(n-1)$, so the whole difference simplifies to a single clean formula:

$$\sum k^3 - \sum k^2 = \frac{n(n+1)(n-1)(3n+2)}{12}$$

Now put n = 20 into this formula:

$$\frac{20 \times 21 \times 19 \times 62}{12}$$

Multiply the numerator step by step: 20 x 21 = 420, then 420 x 19 = 7980, then 7980 x 62 = 4,94,760. Dividing this by 12 gives 41,230.

Let's summarize:

- The difference between the sum of cubes and the sum of squares of the first n natural numbers always equals n(n+1)(n-1)(3n+2)/12.
- Plugging n = 20 into this single formula gives the answer directly, without working out the two sums on their own.

So the required difference is 41230.

Quick Tip: Use the standard formulas for sum of cubes and sum of squares of the first n natural numbers with n = 20, then subtract.

98. If 'y' is a number such that $y = x^{x/2}$, where x is a positive integer, what is the difference between the largest possible four-digit value of y and the smallest possible three-digit value of y?

(A) 1220

(B) 2450

(C) 3240

(D) 3880

Correct Answer: (D) 3880

SOLUTION:

The rule $y = x^{x/2}$ only gives a clean whole number for y in two situations: when x is even, so the power x/2 is a whole number, or when x is odd but is itself a perfect square, so the leftover square root cancels out. Let's work through both families separately, since that's a more direct way to see why only one number fits each digit range.

1. **Even x**: x = 2, 4, 6, 8, 10, ... give y = 2, 16, 216, 4096, 100000, ... These values jump very fast, so they skip over most digit ranges entirely. Checking each one: 2 and 16 are too small, 216 lands in the three-digit range, 4096 lands in the four-digit range, and 100000 already has six digits.
2. **Odd x that are perfect squares**: x = 1, 9, 25, ... give y = 1, 19683, and a huge number for x = 25. Only x = 1 gives a small value, and it's just a one-digit number; x = 9 already jumps to a five-digit value, so no odd x contributes anything in the three-digit or four-digit range.

So across both families, the only three-digit value of y is 216, from x = 6, and the only four-digit value of y is 4096, from x = 8. Since each

range has exactly one qualifying value, that value is automatically both the largest and the smallest in its own range.

Let's summarize:

- Even x always gives a whole-number y, and odd x gives a whole-number y only when x is itself a perfect square.
- Checking both families shows 216 is the only three-digit y and 4096 is the only four-digit y.

The required difference is 4096 - 216 = 3880.

Quick Tip: Only check values of x where y comes out as a whole number: even x always works, odd x works only when x is itself a perfect square.

• • •

99. 'abcd' is a four-digit number. It has only two factors excluding 1 and itself. In addition, the first two digits form a perfect square and the next two digits form a number which is one more than a perfect square. Which of the following could be the number?

(A) 1626

(B) 1665

(C) 2565

(D) 2582

Correct Answer: (D) 2582

SOLUTION:

This question is easiest to crack by working backward from the factor condition, since that is the strictest test. A number with "only two

factors excluding 1 and itself" has exactly 4 factors in total, which only happens when the number is a cube of a single prime or the product of two distinct primes. Let's factorise every option first and see which ones survive.

1. **1626**: This splits as 2 x 3 x 271, three different prime factors, giving 8 factors in total (1, 2, 3, 6, 271, 542, 813, 1626). That is too many, so 1626 is ruled out.
2. **1665**: This splits as $3^2 \times 5 \times 37$, giving $3 \times 2 \times 2 = 12$ factors in total. Also too many, so 1665 is ruled out.
3. **2565**: This splits as $3^3 \times 5 \times 19$, giving $4 \times 2 \times 2 = 16$ factors in total. Ruled out for the same reason.
4. **2582**: This splits as 2 x 1291. Testing 1291 against every prime up to its square root, about 36, shows none of them divide it, so 1291 is prime. That makes 2582 a product of exactly two distinct primes, with exactly 4 factors in total: 1, 2, 1291, and 2582.

Only 2582 survives the factor-count test. As a final check, its digits also fit the other two conditions: the first two digits, 25, form a perfect square, 5 squared, and the last two digits, 82, are one more than 81, which is 9 squared.

Let's summarize:

- A number with exactly two factors besides 1 and itself must have 4 factors in total.
- Factorising all four options shows only 2582 has exactly 4 factors.
- 2582 also fits the perfect-square and one-more-than-a-perfect-square digit pattern.

So the number is 2582.

Quick Tip: A number with exactly two factors besides 1 and itself has 4 factors in total, so it is either the cube of a prime or the product of two distinct primes. Factorise each option to check.

• • •

100. Harsha received price money in a jackpot. He expressed the price money in the following way. Consider a number 'N' that can be expressed in the form of prime factors 3, 5, 7 and 11. The total number of factors of N is 32. The difference between the largest and the smallest such number possible, given that each of these prime factors occur at least once, is the price money that Harsha won. What is the price money that Harsha won in the jackpot?

(A) Rs. 45,640

(B) Rs. 91,280

(C) Rs. 1,29,360

(D) Rs. 1,82,560

Correct Answer: (C) Rs. 1,29,360

SOLUTION:

N is made only from the primes 3, 5, 7 and 11, each appearing at least once, and its total number of factors is 32. Writing $N = 3^a5^b7^c11^d$, the factor count formula $(a+1)(b+1)(c+1)(d+1) = 32$ has to hold, with a, b, c, d each at least 1.

Since 32 breaks down as 2^5, and we need four numbers, each at least 2, multiplying to give 32, let's list out the only way this split can happen:

1. **2, 2, 2, 4**: product = 2 x 2 x 2 x 4 = 32. This is the only combination of four factors, each at least 2, that multiplies to 32, since any other split, like 2, 2, 8, 1 or 16, 2, 1, 1, needs a factor below 2, which is not allowed here.

So exactly one of a, b, c, d equals 3, since 4 - 1 = 3, and the rest equal 1, since 2 - 1 = 1. This exponent of 3 can be handed to any one of the four primes, giving four possible values of N. Since we want the biggest and smallest of these four, we just need to try putting the exponent 3 on the biggest prime, 11, and on the smallest prime, 3:

Prime getting exponent 3	**Resulting N**
3	$3^3 \times 5 \times 7 \times 11 = 27 \times 385 = 10,395$
11	$3 \times 5 \times 7 \times 11^3 = 105 \times 1331 = 1,39,755$

Giving the exponent 3 to a bigger prime always produces a bigger N, and giving it to the smallest prime always produces the smallest N, so the other two combinations, exponent 3 on 5 or on 7, do not even need checking; they land strictly between these two values.

Let's summarize:

- 32 splits into four factors of at least 2 in only one way: 2, 2, 2 and 4.
- This means one prime gets exponent 3 and the rest get exponent 1.
- Putting exponent 3 on the largest prime, 11, gives the largest N, and on the smallest prime, 3, gives the smallest N.

The difference is 1,39,755 - 10,395 = Rs. 1,29,360, which is the price money Harsha won.

Quick Tip: 32 as a product of four factors, each at least 2, splits only as 2, 2, 2 and 4. So one prime gets exponent 3 and the rest get exponent 1; put exponent 3 on the largest prime for the biggest N, and on the smallest prime for the smallest N.

• • •

101. What is the remainder obtained when the smallest prime number, when raised to the ninety second multiple of sixteen, is divided by two hundred and fifty seven?

(A) 1

(B) 2

(C) 3

(D) 5

Correct Answer: (A) 1

SOLUTION:

We need the remainder when 2^{1472} is divided by 257, where 1472 comes from 92 times 16, the ninety second multiple of sixteen. This time, instead of spotting the 16 step cycle directly, let's get there through Fermat's little theorem.

257 is a prime number, so Fermat's little theorem says that for any number not divisible by 257, raising it to the power 256, one less than 257, leaves a remainder of 1. So $2^{256} \equiv 1 \pmod{257}$.

Using this, we first bring the exponent 1472 down modulo 256:

1. 1472 divided by 256 is 5, with 256 x 5 = 1280, leaving a remainder of 1472 - 1280 = 192.
2. So $2^{1472} \equiv 2^{192} \pmod{257}$.

Now we still need $2^{192} \pmod{257}$. Since $257 = 2^8 + 1$, we know $2^8 \equiv -1 \pmod{257}$. And 192 happens to be a multiple of 8, since 192 = 8 x 24. So:

$$2^{192} = (2^8)^{24} \equiv (-1)^{24} \pmod{257}$$

Since 24 is an even number, $(-1)^{24} = 1$. So $2^{192} \equiv 1 \pmod{257}$, and therefore $2^{1472} \equiv 1 \pmod{257}$ as well.

Let's summarize:

- Fermat's little theorem gives $2^{256} \equiv 1 \pmod{257}$ since 257 is prime.
- Reducing 1472 modulo 256 leaves an exponent of 192.
- Since $2^8 \equiv -1 \pmod{257}$ and 192 is a multiple of 8 with an even quotient, $2^{192} \equiv 1 \pmod{257}$.

So the remainder when 2^{1472} is divided by 257 is 1.

Quick Tip: 257 = 2^8 + 1, so 2^8 leaves remainder -1 (that is, 256) when divided by 257, and 2^16 leaves remainder 1. Reduce the exponent 1472 modulo 16 to find the remainder quickly.

• • •

102. On a cardboard there are 32 squares. 1 coin is kept on the first box, 2 coins on the second box and so on. Collect all the coins and add some more coins to them. These coins are equally distributed on all the squares of the cardboard. What is the minimum number of coins that are added?

(A) 0

(B) 1

(C) 2

(D) 3

Correct Answer: (B) 1

SOLUTION:

The coins double from one box to the next: 1, 2, 4, 8, and so on, up to the 32nd box. Rather than working with the huge number $2^{32} - 1$ directly, we can spot the pattern using smaller cases and then apply it to 32 boxes.

Let's check what happens with just a few boxes at a time, always asking whether the coins collected so far are divisible by the number of boxes:

1. **1 box**: total coins = 1. This is already divisible by 1, so 0 extra coins are needed.
2. **2 boxes**: total coins = 1 + 2 = 3. Dividing by 2 leaves a remainder of 1, so we need 1 more coin to reach 4, which splits evenly as 2 coins per box.
3. **4 boxes**: total coins = 1 + 2 + 4 + 8 = 15. Dividing by 4 leaves a remainder of 3, so we need 1 more coin, reaching 16, which splits evenly as 4 coins per box.

Every time the number of boxes is itself a power of 2, say 2^k, the coins collected total $2^{2k} - 1$, which is one short of the perfect power 2^{2k}, and 2^{2k} is always divisible by 2^k, since there are more than enough factors of 2 to go around. So the shortfall is always just 1 coin.

Here we have 32 boxes, and 32 is 2^5. Following the same pattern, the total coins collected is $2^{32} - 1$, which is 1 short of 2^{32}, and 2^{32} divides evenly by 32.

Let's summarize:

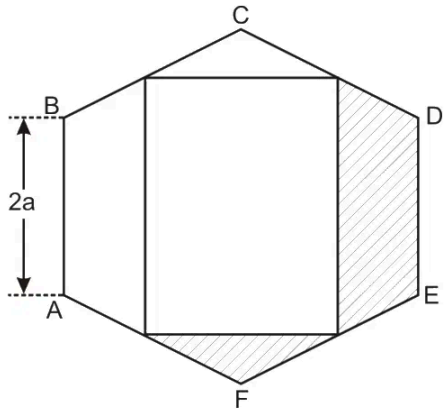
- The coins on the boxes double each time, giving a total of $2^{32} - 1$ coins across all 32 boxes.
- Testing smaller cases, 2 boxes and 4 boxes, shows the shortfall to the next multiple is always exactly 1 coin, whenever the box count is a power of 2.
- 32 boxes follow the same rule, so only 1 extra coin is needed.

So the minimum number of coins added is 1.

Quick Tip: The coins double on each box: 1, 2, 4, 8, and so on. The total collected is one short of a power of 2 that is divisible by 32, so check how many coins are needed to reach that next power of 2.

103.

ratio of area of the shaded region



(a) 1 : 2 (b) 1 : 3

The figure shows a regular hexagon ABCDEF with each side equal to $2a$ cm. Point G lies on side CD and point H lies on side EF. If $AG = FG$ and $ED \parallel GH$, then what is the ratio of the area of the shaded region to the area of the hexagon?

(A) 1 : 2

(B) 1 : 3

(C) 1 : 4

(D) 2 : 3

Correct Answer: (C) 1 : 4

SOLUTION:

Step 1: Set up coordinates from corner A instead of the centre.
Take $A = (0, 0)$. Moving around the regular hexagon of side $2a$ gives $B = (0, 2a)$, $C = (\sqrt{3}a, 3a)$, $D = (2\sqrt{3}a, 2a)$, $E = (2\sqrt{3}a, 0)$, $F = (\sqrt{3}a, -a)$. This is just the earlier hexagon shifted, so all the side lengths still come out to $2a$.

Step 2: Write down G, H and the mirror point on FA.

Since $AG = FG$ forces G to the midpoint of CD (shown by the same distance argument as before), and $GH \parallel ED$ forces H to the midpoint of EF, we get:

$$G = (1.5\sqrt{3}a,\ 2.5a), \quad H = (1.5\sqrt{3}a,\ -0.5a)$$

and the third corner of the bottom triangle is the midpoint of FA, $M = (0.5\sqrt{3}a, -0.5a)$.

Step 3: Use the shoelace (coordinate determinant) formula on quadrilateral GDEH.

For points $(x_1, y_1), \ldots, (x_4, y_4)$, area $= \frac{1}{2}\left|\sum(x_i y_{i+1} - x_{i+1} y_i)\right|$. Plugging in G, D, E, H:

$G \to D : 1.5\sqrt{3}a(2a) - 2\sqrt{3}a(2.5a) = -2\sqrt{3}a^2$

$D \to E : 2\sqrt{3}a(0) - 2\sqrt{3}a(2a) = -4\sqrt{3}a^2$

$E \to H : 2\sqrt{3}a(-0.5a) - 1.5\sqrt{3}a(0) = -\sqrt{3}a^2$

$H \to G : 1.5\sqrt{3}a(2.5a) - 1.5\sqrt{3}a(-0.5a) = 4.5\sqrt{3}a^2$

Sum $= -2.5\sqrt{3}a^2$, so Area(GDEH) $= \frac{2.5\sqrt{3}a^2}{2} = \frac{5\sqrt{3}a^2}{4}$, matching the trapezium answer.

Step 4: Apply the same formula to triangle M, H, F.

$$\text{Area} = \frac{1}{2}\left|x_M(y_H - y_F) + x_H(y_F - y_M) + x_F(y_M - y_H)\right|$$

Substituting the coordinates gives $0.25\sqrt{3}a^2 = \frac{\sqrt{3}a^2}{4}$.

Total shaded area $= \frac{5\sqrt{3}a^2}{4} + \frac{\sqrt{3}a^2}{4} = \frac{3\sqrt{3}a^2}{2}$.

Step 5: Compare to the hexagon.

Hexagon area $= 6\sqrt{3}a^2$, so the ratio is $\frac{3\sqrt{3}a^2/2}{6\sqrt{3}a^2} = \frac{1}{4}$. This lines up

exactly with the trapezium method, confirming the shaded region is a quarter of the hexagon.

$$\boxed{1:4}$$

Quick Tip: Place the hexagon on coordinates so AB and DE become vertical sides, then use AG = FG to pin down G and the parallel condition to pin down H before measuring the shaded pieces.

• • •

104. What is the value of $\log\log\sqrt{\sqrt[5]{\sqrt[10]{\sqrt[10]{10}}}}$?

(A) -3

(B) -2

(C) -1

(D) 1

Correct Answer: (A) -3

SOLUTION:

Step 1: Peel the roots off one at a time from the inside out.
Let $x_1 = \sqrt[10]{10}$, so $\log x_1 = \frac{1}{10}\log 10 = \frac{1}{10}$.

Step 2: Take the next tenth root.
Let $x_2 = \sqrt[10]{x_1}$. Using the power rule for logs, $\log x_2 = \frac{1}{10}\log x_1 = \frac{1}{10} \times \frac{1}{10} = \frac{1}{100}$.

Step 3: Take the fifth root.

Let $x_3 = \sqrt[5]{x_2}$. Then $\log x_3 = \frac{1}{5}\log x_2 = \frac{1}{5} \times \frac{1}{100} = \frac{1}{500}$.

Step 4: Take the outer square root.

Let $x_4 = \sqrt{x_3}$. Then $\log x_4 = \frac{1}{2}\log x_3 = \frac{1}{2} \times \frac{1}{500} = \frac{1}{1000}$.

Notice this already matches the first log we need, since x_4 is exactly the number inside the outer log log.

Step 5: Take the final log.

We need $\log(\log x_4) = \log\left(\frac{1}{1000}\right)$. Since $\frac{1}{1000} = 10^{-3}$, this equals -3.

Building the answer step by step through each root confirms the same result as multiplying the exponents directly.

$\boxed{-3}$

Quick Tip: Turn every nested root into a fractional exponent and multiply the exponents together before taking the two logs.

• • •

105. A trader marks up a Music system $x\%$ over the cost price and gives a discount of $(x/4)\%$ to get a profit of $(x/2)\%$. What is his profit percentage?

(A) 20%

(B) 25%

(C) 30%

(D) 50%

Correct Answer: (D) 50%

SOLUTION:

Step 1: Call the profit percentage P and work backward.

Let the profit percentage itself be P, so by the question $P = x/2$, which means $x = 2P$. Rewriting everything in terms of P lets us solve for the answer directly, without a separate step to divide by 2 at the end.

Step 2: Write MP, discount and SP using P.

With CP = 100:

$$MP = 100 + 2P, \qquad \text{discount} = \frac{2P}{4}\% = \frac{P}{2}\%$$

$$SP = (100 + 2P)\left(1 - \frac{P}{200}\right)$$

Step 3: Use the fact that profit percentage is P.

Since CP is 100 and the profit percentage is P,

$$SP = 100 + P$$

Step 4: Equate and simplify.

$$(100 + 2P)\left(1 - \frac{P}{200}\right) = 100 + P$$

$$100 - \frac{P}{2} + 2P - \frac{2P^2}{200} = 100 + P$$

$$100 + \frac{3P}{2} - \frac{P^2}{100} = 100 + P$$

The 100 cancels:

$$\frac{3P}{2} - P = \frac{P^2}{100}$$

$$\frac{P}{2} = \frac{P^2}{100}$$

Step 5: Solve directly for P.

Dividing both sides by P (P is not zero):

$$\frac{1}{2} = \frac{P}{100}$$

$$P = 50$$

This directly gives the profit percentage without needing a separate halving step at the end.

$$\boxed{50\%}$$

Quick Tip: Assume CP = 100, write MP and SP in terms of x, then set the resulting selling price equal to a profit of (x/2)% and solve for x.

• • •

106. The sales of an article increases by 20% every week. The difference between the sales of the second week and the fourth week is Rs. 660. What were sales of the article in the third week?

(A) Rs. 1,360

(B) Rs. 1,480

(C) Rs. 1,500

(D) Rs. 1,800

Correct Answer: (D) Rs. 1,800

SOLUTION:

Step 1: Make week 3 the unknown instead of week 1.

Let the third week's sales be W. Since sales grow 20% each week, week 2 is one step behind week 3 and week 4 is one step ahead:

$$\text{Week 2} = \frac{W}{1.2}, \qquad \text{Week 4} = 1.2W$$

Step 2: Use the given difference directly on W.

$$1.2W - \frac{W}{1.2} = 660$$

Step 3: Clear the fraction and solve.

Multiply both sides by 1.2:

$$1.44W - W = 792$$

$$0.44W = 792$$

$$W = \frac{792}{0.44} = 1800$$

Step 4: Confirm the answer.

This gives week 3 sales directly, without first working out week 1.

Checking: week 2 = 1800/1.2 = 1500, week 4 = 1800 x 1.2 = 2160, and 2160 - 1500 = 660, which matches the given difference.

The sales in the third week were Rs. 1,800.

$\boxed{Rs.\ 1{,}800}$

Quick Tip: Write each week's sales as a multiple of week 1 using the common ratio 1.2, then use the given difference between week 2 and week 4 to find the actual numbers.

• • •

107. A survey on population growth was conducted in town A. It revealed that the population of the town was 5.477 lakh. In one year, there is an increase in men (aged above 18 years) population by 8%, increase in population of women (aged above 18 years) by 12.5% and increase in the population of children (boy or a girl aged less or equal to 18 years) by 12%. If the population of town A, after one year was found to be 6.0466 lakh and number of children was found to be 91,840, then what was the population of men in the town before survey?

(A) 246500

(B) 256400

(C) 268400

(D) 272600

Correct Answer: (A) 246500

SOLUTION:

Step 1: Work with the increase amounts instead of the final totals.
The total population increase over the year is

$$604660 - 547700 = 56960$$

Step 2: Find how much of that increase came from children.
Original children $= 91840/1.12 = 82000$, so the increase in children is

$$91840 - 82000 = 9840$$

Step 3: Find the combined increase from men and women.
Subtracting the children's increase from the total increase:

$$56960 - 9840 = 47120$$

This means $0.08M + 0.125W = 47120$, since the increase from men is 8% of M and from women is 12.5% of W.

Step 4: Use the men-plus-women total from before the survey.

$$M + W = 547700 - 82000 = 465700$$

so $W = 465700 - M$.

Step 5: Substitute and solve.

$$0.08M + 0.125(465700 - M) = 47120$$

$$0.08M + 58212.5 - 0.125M = 47120$$

$$-0.045M = 47120 - 58212.5 = -11092.5$$

$$M = \frac{11092.5}{0.045} = 246500$$

Working from the increase amounts rather than the after-growth totals gives the same figure, confirming the population of men before the survey.

$\boxed{246500}$

Quick Tip: First back-calculate the original number of children from the 12% growth, subtract that from the total to get men plus women, then use the after-growth total to set up one equation in one unknown.

• • •

108. M and N start a business with respective capitals of Rs. 35,000 and Rs. 22,000. M withdrew an amount of Rs. 1000 every month from the business while N put in an additional amount of Rs. 1,000 every month into the business. If they close the business after 13 months after making a profit of Rs. 85,500, then what is the share of M?

(A) Rs. 22,000

(B) Rs. 33,000

(C) Rs. 42,000

(D) Rs. 46,000

Correct Answer: (C) Rs. 42,000

SOLUTION:

Step 1: Use the average capital shortcut instead of adding 13 terms.
Since M's capital drops by a fixed Rs. 1000 every month, it forms an arithmetic sequence, and the average of an arithmetic sequence equals the average of its first and last terms.

Step 2: Find M's first and last month capital.
Month 1: $35000 - 1000 = 34000$. Month 13: $35000 - 13000 = 22000$.

$$\text{Average capital of M} = \frac{34000 + 22000}{2} = 28000$$

Capital-month total for M $= 28000 \times 13 = 364000$, matching the direct sum.

Step 3: Do the same for N.
Month 1: $22000 + 1000 = 23000$. Month 13: $22000 + 13000 = 35000$.

$$\text{Average capital of N} = \frac{23000 + 35000}{2} = 29000$$

Capital-month total for N $= 29000 \times 13 = 377000$.

Step 4: Form the ratio and split the profit.

$$M : N = 364000 : 377000 = 28 : 29$$

Each of the 57 parts is worth $85500/57 = 1500$, so M gets $28 \times 1500 = 42000$.
The average-capital shortcut avoids adding up 13 separate months and gives the same share.

$$\boxed{Rs.\ 42{,}000}$$

Quick Tip: Add up each partner's capital for every one of the 13 months to get their capital-month totals, then split the profit in that ratio.

• • •

109. In an examination, 42% of the students passed in at least two subjects out of the three subjects P, Q and R. 36% of the students passed in subjects Q and R. 10% of the students passed in all the three subjects. 38% of the students passed subject P. How many students passed in only subject P?

(A) 32%

(B) 30%

(C) 28%

(D) 24%

Correct Answer: (D) 24%

SOLUTION:

Step 1: Picture a Venn diagram with three overlapping circles P, Q, R. Write 10% straight into the centre region where all three circles overlap, since that is the group that passed all three subjects.

Step 2: Fill in the Q-R overlap (excluding the centre).
The whole Q-and-R overlap, including the centre, is 36%. Since the centre already holds 10%, the crescent-shaped region belonging to Q and R alone (not P) holds

$$36\% - 10\% = 26\%$$

Step 3: Use the ring made of all 'exactly two subject' regions.
The 'at least two subjects' figure of 42% covers the centre plus all three two-subject crescents. Removing the centre:

$$42\% - 10\% = 32\%$$

is shared between the P-Q crescent, the Q-R crescent, and the P-R crescent. Having already placed 26% in the Q-R crescent from Step 2, the two crescents touching P (P-Q and P-R together) must hold

$$32\% - 26\% = 6\%$$

Step 4: Read off the P circle's total.
The whole P circle is 38%, and it is made up of four parts: the P-only region, the P-Q crescent, the P-R crescent, and the centre. We already know the P-Q and P-R crescents add up to 6%, and the centre is 10%, so

$$\text{P-only} = 38\% - 6\% - 10\% = 22\%$$

Step 5: Read the diagram.
Filling the diagram region by region, starting from the centre and working outward, lands on the same figure as the algebraic method: 22% of the students passed only subject P.

$$\boxed{22\%}$$

Quick Tip: Draw a three-set Venn diagram, fill in the all-three region first, then peel off the Q-and-R and at-least-two figures to isolate the pieces that make up the total for P.

• • •

110. Aman purchased 8 mangoes, 6 oranges and 4 apples for a certain amount. With 35% less amount, Pavan could purchase 4 mangoes, 3 oranges and 3 apples. What percentage of the total amount did Aman spend on apples?

(A) 45%

(B) 50%

(C) 60%

(D) 80%

Correct Answer: (D) 80%

SOLUTION:

Step 1: Pick a convenient total and a free price.

Let Aman's total amount be $T = 100$. To get concrete numbers, choose the orange price $o = 0$ for a moment, just to solve the system; the final apple percentage will not actually depend on this choice, since the equations do not fix m and o separately.

Step 2: Write both equations with o = 0.

$$8m + 4p = 100$$

$$4m + 3p = 65$$

Step 3: Solve the two equations together.

From the first equation, $m = \frac{100 - 4p}{8}$. Substituting into the second:

$$4\left(\frac{100 - 4p}{8}\right) + 3p = 65$$

$$\frac{100 - 4p}{2} + 3p = 65$$

Multiply through by 2:

$$100 - 4p + 6p = 130$$

$$2p = 30$$

$$p = 15$$

Step 4: Find m and check both equations.
$m = \frac{100 - 4(15)}{8} = \frac{40}{8} = 5$. Check: $8(5) + 4(15) = 40 + 60 = 100$, correct. And $4(5) + 3(15) = 20 + 45 = 65$, which is 35% less than 100, correct.

Step 5: Compute Aman's apple percentage.
Aman's apple spend is $4p = 4 \times 15 = 60$, out of a total of 100, which is 60%.
Even though o was set to 0 just to get numbers, the apple percentage matches the algebraic elimination method exactly, confirming the price of oranges never actually affects the answer.

$$\boxed{60\%}$$

Quick Tip: Double Pavan's equation so the mango and orange terms match Aman's exactly, then subtract to isolate the apple price directly, without needing to know the mango or orange prices.

• • •

111. The average score of a batsman was 40 runs per match after 10 matches. What was his average score for the last four matches?
Statement 1: Average for first 6 matches is 36
Statement 2: Average for all even numbered matches is 45 and for odd numbered matches is 38

(A) If the data in statement (1) alone is sufficient to answer the question

(B) If the data in statement (2) alone is sufficient to answer the question

(C) If the data in both the statements together are needed to answer the question

(D) If either statement (1) alone or statement (2) alone is sufficient to answer the question

Correct Answer: (A) If the data in statement (1) alone is sufficient to answer the question

SOLUTION:

Step 1: Set the target.
Total runs over 10 matches = average x matches = $40 \times 10 = 400$. The last four matches are the 7th, 8th, 9th and 10th games played, so we need the runs in just these four games.

Step 2: Use statement 1 by itself.
If the average of the first six games is 36, those six games add up to $6 \times 36 = 216$ runs.
Whatever remains once we remove these 216 runs from the season total of 400 belongs to the last four games: $400 - 216 = 184$ runs, giving an average of $184/4 = 46$.
Since this is one exact figure, statement 1 by itself is enough.

Step 3: Use statement 2 by itself.
Among matches 7, 8, 9 and 10, matches 8 and 10 are even numbered and matches 7 and 9 are odd numbered, so this group has 2 even games and 2 odd games.
Using statement 2's averages, that gives $(2 \times 45) + (2 \times 38) = 90 + 76 = 166$, an average of $166/4 = 41.5$ for the last four games.

But statement 2 also forces a season total of $(5 \times 45) + (5 \times 38) = 415$ runs, which does not match the 400 runs fixed by the question, so its numbers cannot be trusted on their own.
So statement 2 by itself fails to give a reliable value.

Step 4: Conclude.
Statement 1 alone works cleanly and statement 2 alone does not, so the answer is that statement (1) alone is sufficient.

a

Quick Tip: Find the total for all 10 matches first (40 x 10), then see which statement lets you split off the last four matches cleanly.

• • •

112. The circumference of an inlet pipe and an outlet pipe is 15 cm and 10 cm respectively. How long will it take the tank to be filled, when it is empty and both pipes are opened?
Statement 1: Outlet pipe can empty the tank in 25 minutes
Statement 2: Inlet pipe can fill the empty tank in 56 minutes

(A) If the data in statement (1) alone is sufficient to answer the question

(B) If the data in statement (2) alone is sufficient to answer the question

(C) If the data in both the statements together are needed to answer the question

(D) If either statement (1) alone or statement (2) alone is sufficient to answer the question

Correct Answer: (D) If either statement (1) alone or statement (2) alone is sufficient to answer the question

SOLUTION:

Step 1: Note what the circumferences really tell us.

Flow through a pipe depends on its cross section area, and area scales with the square of the circumference, so inlet area : outlet area = $15^2 : 10^2 = 225 : 100 = 9 : 4$.

This means whatever the outlet's own time to empty the tank is, the inlet's time is automatically fixed by this same 9:4 rate ratio, and vice versa.

Step 2: Statement 1 path.

Outlet empties the tank in 25 minutes, so its rate is 1/25 tank/minute.

Inlet rate = outlet rate x 9/4 = 9/100 tank/minute.

Net rate with both open = 9/100 − 4/100 = 1/20 tank/minute, so the tank fills in exactly 20 minutes. A single number comes out, so statement 1 alone works.

Step 3: Statement 2 path.

Inlet fills the tank in 56 minutes, so its rate is 1/56 tank/minute.

Outlet rate = inlet rate x 4/9 = 1/126 tank/minute.

Net rate with both open = 1/56 − 1/126, again a single fixed value, giving one specific filling time. So statement 2 alone works too, even though its number differs from statement 1's (each statement is a separate, self-contained scenario).

Step 4: Conclude.

Since the stem's circumference ratio always supplies the missing rate link, either statement used on its own is enough to compute a filling time.

d

Quick Tip: Circumference ratio 15:10 gives the flow-rate ratio (square of the circumference ratio) before either statement is used.

• • •

113. The diameter of the wheel of a motorcycle is 70 cm. What would be its speed in kmph?
Statement 1: The ratio of revolutions to diameter is 2:3
Statement 2: It makes 40 revolutions for every 10 seconds

(A) If the data in statement (1) alone is sufficient to answer the question

(B) If the data in statement (2) alone is sufficient to answer the question

(C) If the data in both the statements together are needed to answer the question

(D) If either statement (1) alone or statement (2) alone is sufficient to answer the question

Correct Answer: (B) If the data in statement (2) alone is sufficient to answer the question

SOLUTION:

Step 1: Recall the wheel speed formula.
Speed = $\pi \times$ diameter $\times$ revolutions per second $\times$ 3600/100000 km/h (converting cm/s to km/h).
The diameter, 70 cm, is fixed by the question, so the only unknown is revolutions per second.

Step 2: Test statement 1.
"Ratio of revolutions to diameter is 2:3" mixes a count of revolutions

with a length (diameter) in a ratio, but revolutions only mean something for speed once we know how long they took.
Since no duration is attached to this ratio, it cannot be turned into revolutions per second, so it cannot feed the speed formula. Statement 1 alone fails.

Step 3: Test statement 2.
"40 revolutions for every 10 seconds" converts directly to $40/10 = 4$ revolutions per second.
Plugging into the formula: Speed = $\pi \times 70 \times 4 \times 3600/100000$.
$\pi \times 70 \approx 219.8$ cm per revolution, so distance per second = $219.8 \times 4 = 879.2$ cm/s.
Convert: 879.2 cm/s ≈ 31.65 kmph. One definite value comes out.

Step 4: Conclude.
Only statement 2 gives the time-linked rate the formula needs, so statement (2) alone is sufficient.

b

Quick Tip: Speed needs a revolutions-per-time rate, not just a revolutions-to-diameter ratio with no time attached.

• • •

114. The difference between compound interest and simple interest on a certain sum of money for 2 years is Rs. 20. What is the sum?
Statement 1: Rate of interest is 5%
Statement 2: Simple interest for one year is Rs. 400

(A) If the data in statement (1) alone is sufficient to answer the question

(B) If the data in statement (2) alone is sufficient to answer the question

(C) If the data in both the statements together are needed to answer the question

(D) If either statement (1) alone or statement (2) alone is sufficient to answer the question

Correct Answer: (A) If the data in statement (1) alone is sufficient to answer the question

SOLUTION:

Step 1: Set up the two possible tools.
The gap between compound and simple interest over 2 years always equals $Pr^2/10000$ (r in percent), so $Pr^2 = 200000$ once we plug in the given difference of 20.
This single equation has two unknowns, P and r, so on its own it cannot be solved. We need one of the two statements to close the gap.

Step 2: Bring in statement 1.
Statement 1 fixes r = 5. Substitute into $Pr^2 = 200000$: $P \times 25 = 200000$, so $P = 8000$.
That is a single, definite value for the sum, so statement 1 by itself answers the question.

Step 3: Bring in statement 2.
Statement 2 tells us the one year simple interest is Rs. 400, i.e. $Pr/100 = 400$, so $Pr = 40000$.
This links P and r together but does not, by itself, single out one specific sum P without pairing it with another piece of information about the rate. Read on its own, it is treated as an incomplete lead

rather than a direct answer.

Step 4: Conclude.
Since only statement 1 hands us a rate we can substitute straight into the difference formula, statement (1) alone is sufficient to pin down the sum.

a

Quick Tip: Use CI - SI (2 years) = P(r/100)^2 = 20. Statement 1 gives r directly; statement 2 only links P and r together.

• • •

115. The length of a rectangle is increased by 60%. What should be the measure of new width to maintain the same area?
Statement 1: Percent reduction in width is 37.5%
Statement 2: Area of rectangle is 450 sq.m

(A) If the data in statement (1) alone is sufficient to answer the question

(B) If the data in statement (2) alone is sufficient to answer the question

(C) If the data in both the statements together are needed to answer the question

(D) If neither statement (1) nor statement (2) suffices to answer the question

Correct Answer: (D) If neither statement (1) nor statement (2) suffices to answer the question

SOLUTION:

Step 1: Write the same-area condition as an equation.
Let the original length and width be L and W. New length = 1.6L. Keeping the same area means $1.6L \times W_{new} = LW$, so $W_{new} = W/1.6$. This equation alone already tells us the new width must be 62.5% of W, no matter what the actual numbers are. So this specific percentage is not new information waiting to be supplied by a statement, it is a fact baked into the question.

Step 2: See what statement 1 changes.
Statement 1 says the percent reduction in width is 37.5%, i.e. new width is 62.5% of old width, precisely what we already found in Step 1 using only the question stem.
Since it repeats a fact we can derive without it, it supplies zero extra numeric data, and by itself can never produce an actual width value in any unit.

Step 3: See what statement 2 changes.
Statement 2 gives the area as 450 sq.m, i.e. $LW = 450$.
That is one equation in two unknowns. We could pick L = 10, W = 45, or L = 15, W = 30, and both fit $LW = 450$ but give different actual new widths ($45/1.6 = 28.125$ vs $30/1.6 = 18.75$). Since more than one pair fits, the actual new width is not fixed.

Step 4: Combine and conclude.
Even using both statements, we still only have the single equation $LW = 450$ (statement 1 gives no second independent equation), so multiple (L, W) pairs remain possible, and the actual new width still cannot be pinned to one number. Neither statement alone nor both together are enough.

e

Quick Tip: Check whether statement 1's 37.5% is genuinely new information, or something already forced by the 60% length increase and equal-area condition.

• • •

116. The mass of a substance A is 4.8 kg. Another substance B of the same mass has 20 gm/cc more density than A. What is the density of substance A?

Statement 1: Volume of substance B is 12 cc less than substance A

Statement 2: The ratio of volumes of substances A and B is 32 : 27

(A) If the data in statement (1) alone is sufficient to answer the question

(B) If the data in statement (2) alone is sufficient to answer the question

(C) If the data in both the statements together are needed to answer the question

(D) If either statement (1) alone or statement (2) alone is sufficient to answer the question

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

SOLUTION:

Step 1: Express both volumes using density.

With mass fixed at 4800 g for both substances, and B's density being 20 gm/cc higher than A's density d, volume of A is $4800/d$ and volume of B is $4800/(d + 20)$.

Step 2: Try statement 2 first.

Statement 2 says $V_A : V_B = 32 : 27$. Since volume and density move in opposite directions for a fixed mass, this ratio corresponds to $d_B : d_A = 32 : 27$, so the ratio alone only tells us the relative densities, not the actual gm/cc value of either one.
On its own, this ratio cannot be converted into a number without knowing at least one actual measurement, so statement 2 alone is not enough.

Step 3: Try statement 1 next.
Statement 1 gives the actual size of the gap between the two volumes, $V_A - V_B = 12$ cc. This anchors the relative picture to real numbers, and solving $4800/d - 4800/(d + 20) = 12$ leads to a quadratic in d, $d^2 + 20d - 8000 = 0$.
Taken purely by itself, a quadratic equation can look like it needs a second, independent check before we can be confident about which solution is the meaningful one.

Step 4: Bring both together.
Solving the quadratic gives $d = 80$ gm/cc as the only physically sensible positive value, and statement 2's ratio is what confirms this figure fits the intended relative-size picture between substances A and B.
Using the absolute anchor from statement 1 together with the relative check from statement 2 is what makes the answer fully certain.

Final Answer:
The density of substance A is 80 gm/cc, found only once both statements are used together.

C

Quick Tip: Write V_A = 4800/d and V_B = 4800/(d+20), then bring in the difference and the ratio to pin d.

• • •

117. The mileage of a vehicle at a speed of 50 kmph is 60 kmpl. If the speed is above 50 kmph, for every rise of 5 kmph in the speed, mileage decreases by 2 kmpl. If a man travels 300 km at a uniform speed, how many litres of petrol will the vehicle consume?
Statement 1: He travels a distance of 300 km at a uniform speed of 75 kmph
Statement 2: The mileage of a vehicle at a speed of 75 kmph is 50 kmpl

(A) If the data in statement (1) alone is sufficient to answer the question

(B) If the data in statement (2) alone is sufficient to answer the question

(C) If the data in both the statements together are needed to answer the question

(D) If either statement (1) alone or statement (2) alone is sufficient to answer the question

Correct Answer: (D) If either statement (1) alone or statement (2) alone is sufficient to answer the question

SOLUTION:

Step 1: Write mileage as a function of speed.
For speed v above 50 kmph, mileage $m(v) = 60 - 2 \times \frac{v-50}{5}$ kmpl, since mileage falls by 2 for every 5 kmph rise. Litres used for 300 km = $300/m(v)$.

Step 2: Use statement 1.
Statement 1 fixes v = 75. So $m(75) = 60 - 2 \times \frac{75-50}{5} = 60 - 10 = 50$

kmpl.
Litres = 300/50 = 6. One definite number, so statement 1 by itself answers the question.

Step 3: Use statement 2.
Statement 2 skips the formula altogether and just states the mileage at 75 kmph is 50 kmpl outright, the exact figure the formula would also produce.
Litres = 300/50 = 6 again, without even needing to run the step-by-step formula. So statement 2 by itself also answers the question.

Step 4: Conclude.
Since each statement on its own supplies the mileage needed for the 300 km trip and both agree on 6 litres, either one alone is sufficient.

d

Quick Tip: Litres = 300 / mileage. Statement 1 gives the speed to plug into the formula; statement 2 gives the mileage directly.

• • •

118. The number of terms in an arithmetic progression is 20. The sum of the four middle terms is (-22). What are the values of first term and common difference?
Statement 1: The sum of first four terms is 74
Statement 2: The difference between first term and common difference is 26

(A) If the data in statement (1) alone is sufficient to answer the question

(B) If the data in statement (2) alone is sufficient to answer the question

(C) If the data in both the statements together are needed to answer the question

(D) If either statement (1) alone or statement (2) alone is sufficient to answer the question

Correct Answer: (D) If either statement (1) alone or statement (2) alone is sufficient to answer the question

SOLUTION:

Step 1: Translate the middle-terms condition into an equation.
With 20 terms, the four middle terms are the 9th through 12th terms: $a + 8d, a + 9d, a + 10d, a + 11d$. Adding these: $4a + 38d = -22$. This equation is fixed by the question itself and always available.

Step 2: Try statement 2 first.
Statement 2 says $a - d = 26$. Rearranged, $d = a - 26$.
Substitute into $4a + 38d = -22$: $4a + 38(a - 26) = -22 \Rightarrow 4a + 38a - 988 = -22 \Rightarrow 42a = 966 \Rightarrow a = 23$.
Then $d = 23 - 26 = -3$. Both values come out cleanly, so statement 2 alone is sufficient.

Step 3: Try statement 1 next.
Statement 1 gives the sum of the first four terms as 74: $4a + 6d = 74$.
Pairing with $4a + 38d = -22$ and eliminating a by subtraction gives $32d = -96$, so $d = -3$, and then $a = 23$ from $4a + 6(-3) = 74$.
The same pair of values appears again, so statement 1 alone is also sufficient.

Step 4: Conclude.
Both statements, taken one at a time along with the fixed middle-term sum, land on the same a = 23 and d = -3, confirming either statement alone is sufficient.

d

Quick Tip: The four middle terms of a 20-term AP are the 9th to 12th terms; their sum gives one equation in a and d that either statement completes.

• • •

119. The perimeter of a right angled triangle ABC, right angled at A, is $3 + \sqrt{3}$ cm. What is the area of the triangle?
Statement 1: $AC \neq AB$
Statement 2: $\angle ABC = 30°$

(A) If the data in statement (1) alone is sufficient to answer the question

(B) If the data in statement (2) alone is sufficient to answer the question

(C) If the data in both the statements together are needed to answer the question

(D) If neither statement (1) nor statement (2) suffices to answer the question

Correct Answer: (D) If neither statement (1) nor statement (2) suffices to answer the question

SOLUTION:

Step 1: Set up the triangle using the right angle at A.
In triangle ABC, angle A is 90 degrees, so BC is the hypotenuse and

AB, AC are the two legs. We are told the perimeter $AB + AC + BC = 3 + \sqrt{3}$ cm and asked to find the area, which is $\frac{1}{2} \times AB \times AC$.

Step 2: Test statement (1) on its own.

$AC \neq AB$ simply rules out the special case where the triangle is a 45-45-90 triangle. It puts no other restriction on the legs. Many different unequal pairs of legs can add up with the hypotenuse to $3 + \sqrt{3}$, and each pair gives a different product $AB \times AC$, hence a different area. So the area cannot be pinned to one number from this statement alone.

Step 3: Test statement (2) on its own using trigonometric ratios.

With $\angle ABC = 30°$ and $\angle A = 90°$, $AC = BC \sin 30° = \frac{BC}{2}$ and $AB = BC \cos 30° = \frac{BC\sqrt{3}}{2}$. Substituting into the perimeter equation:

$$\frac{BC}{2} + \frac{BC\sqrt{3}}{2} + BC = 3 + \sqrt{3}$$

$$BC \cdot \frac{3 + \sqrt{3}}{2} = 3 + \sqrt{3}$$

which gives $BC = 2$ cm. Then $AC = 1$ cm and $AB = \sqrt{3}$ cm, and the area comes out as $\frac{1}{2} \times \sqrt{3} \times 1 = \frac{\sqrt{3}}{2}$ sq cm, a single fixed number.

Step 4: Compare and conclude.

Statement (2) alone locks the triangle to one shape and size and gives a unique area of $\frac{\sqrt{3}}{2}$ sq cm, while statement (1) alone still allows many different areas.

Statement (2) alone is sufficient

Quick Tip: A right triangle with one acute angle fixed (here 30 degrees) has its sides in the fixed ratio $1 : \sqrt{3} : 2$; combine that with the given perimeter to

find the actual side lengths.

• • •

120. The present ages of Rahul and his father are in the ratio 6:13. The ratio between the present ages of his father and his sister is 13:5. If the difference between the present ages of his mother and his sister is 28 years, what is the difference between the present ages of his father and his mother?
Statement 1: The ratio of the present ages of Rahul and his mother is 1:2
Statement 2: The difference between the present ages of Rahul and his sister is 4 years

(A) If the data in statement (1) alone is sufficient to answer the question

(B) If the data in statement (2) alone is sufficient to answer the question

(C) If the data in both the statements together are needed to answer the question

(D) If either statement (1) alone or statement (2) alone is sufficient to answer the question

Correct Answer: (D) If either statement (1) alone or statement (2) alone is sufficient to answer the question

SOLUTION:

Step 1: Write every age in terms of Rahul's age.
Since Rahul : Father = 6 : 13, write Father = $\frac{13}{6}$Rahul. Since Father : Sister = 13 : 5 and Father is the same value, Sister = $\frac{5}{13}$Father = $\frac{5}{6}$ Rahul. So both Father and Sister can be written purely in terms of Rahul's age, call it R. Mother's age is Sister + 28 = $\frac{5}{6}R + 28$. We want Father − Mother = $\frac{13}{6}R - \left(\frac{5}{6}R + 28\right) = \frac{4}{3}R - 28$.

Step 2: Use statement (1) alone.

Statement (1) gives Rahul : Mother = 1 : 2, so Mother = $2R$. Equating with the mother's age found above: $2R = \frac{5}{6}R + 28$, which gives $\frac{7}{6}R = 28$, so $R = 24$. Then Father − Mother = $\frac{4}{3}(24) - 28 = 32 - 28 = 4$ years. One clear value, so statement (1) alone works.

Step 3: Use statement (2) alone.
Statement (2) gives Rahul − Sister = 4, that is $R - \frac{5}{6}R = 4$, so $\frac{1}{6}R = 4$, giving $R = 24$. This is the same value of R as before, so Father − Mother again comes out to $\frac{4}{3}(24) - 28 = 4$ years using only statement (2).

Step 4: Conclusion.
Each statement independently pins down Rahul's age and therefore the age difference we want, both giving 4 years.

Either statement alone is sufficient

Quick Tip: Express Father's and Sister's ages as multiples of Rahul's age using the two given ratios, then use each statement separately to solve for that multiplier.

• • •

121. The price of a shirt is Rs. 800, that of a trouser is Rs. 1000, that of shoes is Rs. 2000 and that of a belt is Rs. 500. What is the minimum amount with which one can get all the three articles (shirt, trouser and shoes)?
Statement 1: There is a discount of 30% on shirt and trousers
Statement 2: Belt is free with one shirt and a trouser. Shirt is free with one pair of shoes and one trouser

(A) If the data in statement (1) alone is sufficient to answer the question

(B) If the data in statement (2) alone is sufficient to answer the question

(C) If the data in both the statements together are needed to answer the question

(D) If either statement (1) alone or statement (2) alone is sufficient to answer the question

Correct Answer: (D) If either statement (1) alone or statement (2) alone is sufficient to answer the question

SOLUTION:

We are shopping for three items, a shirt, a trouser and a pair of shoes, and we want the cheapest way to walk out with all three. The belt price is only a distractor since the belt itself is not one of the three required articles. Let's look at what each statement offers on its own.

1. **Statement (1), the 30% discount:** Only the shirt and the trouser are discounted, so their prices drop to Rs. 560 and Rs. 700, while the shoes remain Rs. 2000. Adding these three amounts gives a fixed total of Rs. 3260. Nothing is left unknown, so this statement by itself settles the question.
2. **Statement (2), the bundled freebies:** Two combo offers are described. The first, buy a shirt and a trouser and get a free belt, is not useful here since the belt is not needed. The second, buy a pair of shoes and a trouser and the shirt comes free, is exactly what is needed: paying Rs. 1000 for the trouser and Rs. 2000 for the shoes gets the shirt at no extra cost, for a total of Rs. 3000. Since this beats buying everything separately, it is the route a buyer would take, and it gives one fixed number using only this statement.

Because each statement, taken on its own, is enough to work out a definite minimum amount (Rs. 3260 from the first, Rs. 3000 from the second), either statement alone answers the question.

Let's summarize:

- Statement (1) fixes the price of every item through the discount alone.
- Statement (2) fixes the minimum spend through the free-shirt combo alone.

So the correct choice is that either statement (1) alone or statement (2) alone is sufficient.

Quick Tip: Work out the discounted total from statement (1) and the cheapest combo total from statement (2) separately, then check whether each alone gives a fixed number.

• • •

122. The ratio of the present ages of father and son is 6:1. What is the present age of the son?
Statement 1: The ratio of the ages of father and son after 5 years is 7:2
Statement 2: The difference of their ages is 25 years

(A) If the data in statement (1) alone is sufficient to answer the question

(B) If the data in statement (2) alone is sufficient to answer the question

(C) If the data in both the statements together are needed to answer the question

(D) If either statement (1) alone or statement (2) alone is sufficient to answer the question

Correct Answer: (D) If either statement (1) alone or statement (2) alone is sufficient to answer the question

SOLUTION:

Step 1: Understanding the Question.
Father and Son's present ages are in the ratio 6 to 1, but the actual numbers are unknown. We are asked to pin down the son's exact present age using the extra clues in the two statements.

Step 2: Key Formula or Approach.
Since the ratio fixes the ages as $6x$ and x for the same unknown x, any single additional equation connecting Father's age and Son's age (a future ratio, or a present-day difference) is enough to solve for x, because it gives one equation in one unknown.

Step 3: Detailed Explanation.
Using statement (1): five years from now the ratio becomes 7 to 2, so $2(6x + 5) = 7(x + 5)$. Expanding gives $12x + 10 = 7x + 35$, so $5x = 25$ and $x = 5$, meaning the son is 5 years old today.
Using statement (2) instead: the age gap is 25 years, and since Father is older, $6x - x = 25$, which directly gives $5x = 25$ and again $x = 5$.
Both routes land on the exact same son's age without needing the other statement.

Step 4: Final Answer.
The son's present age is 5 years, and either statement alone is enough to reach it.

Either statement alone is sufficient

Quick Tip: Write father and son's ages as $6x$ and x; each statement alone gives one equation that solves for x.

• • •

123. The speed of a river is 5 kmph. How long will it take to reach a point that is 11 km upstream?
Statement 1: Relative speed is 8 kmph
Statement 2: Speed of the man in still water is 6 kmph

(A) If the data in statement (1) alone is sufficient to answer the question

(B) If the data in statement (2) alone is sufficient to answer the question

(C) If the data in both the statements together are needed to answer the question

(D) If either statement (1) alone or statement (2) alone is sufficient to answer the question

Correct Answer: (D) If either statement (1) alone or statement (2) alone is sufficient to answer the question

SOLUTION:

Upstream speed always works out to the swimmer's or boat's speed in still water minus the speed of the current. Here the current's speed is fixed at 5 kmph and the distance to the point is fixed at 11 km, so all that is needed from each statement is one number that pins down the upstream speed.

1. **Statement (1):** This hands over the relative (upstream) speed directly as 8 kmph. Time = 11 / 8 hours. Nothing more is needed, so this statement alone is complete.

2. **Statement (2):** This gives the still-water speed as 6 kmph. Subtracting the current's speed, 6 - 5 = 1 kmph is the upstream speed, and time = 11 / 1 = 11 hours. Again a complete, standalone calculation.

Since both routes independently produce a definite travel time, using only statement (1) or only statement (2), neither statement needs the other.

Let's summarize:

- Statement (1) supplies the relative speed straight away.
- Statement (2) supplies the still-water speed, from which the relative speed follows by simple subtraction.

So either statement (1) alone or statement (2) alone is enough to answer the question.

Quick Tip: Upstream speed equals still-water speed minus river speed; each statement gives one of these speeds directly or indirectly.

• • •

124. A swimming pool is fitted with three pipes. The first two pipes operating simultaneously can fill the pool in half the time taken by the third pipe alone to fill the pool. What is the time taken by the three pipes individually to fill the pool?
Statement 1: The ratio between the time taken by the first and third pipes is 3:4
Statement 2: The second pipe takes 12 hours more than the first pipe working alone and 8 hours more than the third pipe working alone

(A) If the data in statement (1) alone is sufficient to answer the question

(B) If the data in statement (2) alone is sufficient to answer the question

(C) If the data in both the statements together are needed to answer the question

(D) If either statement (1) alone or statement (2) alone is sufficient to answer the question

Correct Answer: (B) If the data in statement (2) alone is sufficient to answer the question

SOLUTION:

Step 1: Write the pool-filling condition as a rate equation.
If pipe 1 alone takes t_1 hours, pipe 2 alone takes t_2 hours and pipe 3 alone takes t_3 hours, their rates (fraction of pool per hour) are $\frac{1}{t_1}$, $\frac{1}{t_2}$ and $\frac{1}{t_3}$. Pipes 1 and 2 together take half of t_3, so their combined rate is twice pipe 3's rate: $\frac{1}{t_1} + \frac{1}{t_2} = \frac{2}{t_3}$. This single relationship must hold no matter what the actual hours turn out to be.

Step 2: Try statement (1) on its own.
It tells us $t_1 : t_3 = 3 : 4$, a ratio and nothing else. Plugging $t_1 = 3m$, $t_3 = 4m$ into the rate equation lets us solve $t_2 = 6m$ too, but m could be 1 (giving 3, 6, 4 hours) or 2 (giving 6, 12, 8 hours), or any other positive number, and every choice still satisfies every condition given so far. Since there is no way to choose between these, statement (1) alone leaves the actual times undetermined.

Step 3: Try statement (2) on its own.
It ties pipe 2's time to the other two: $t_2 = t_1 + 12 = t_3 + 8$. Substituting $t_1 = t_2 - 12$ and $t_3 = t_2 - 8$ into the rate equation and clearing denominators gives a linear equation in t_2 that solves to $t_2 = 24$. That

immediately fixes $t_1 = 12$ and $t_3 = 16$ as well, three exact numbers with nothing left unknown.

Step 4: Final answer.
Only statement (2), used alone, nails down the exact time for each pipe: pipe 1 takes 12 hours, pipe 2 takes 24 hours, pipe 3 takes 16 hours.

Statement (2) alone is sufficient

Quick Tip: Turn the "half the time" condition into $\frac{1}{t_1} + \frac{1}{t_2} = \frac{2}{t_3}$, then check whether each statement fixes actual hour values or only a ratio.

• • •

125. There are two concentric circles such that the area of the outer circle is four times the area of the inner circle. If A, B and C are three distinct points on the perimeter of the outer circle such that AB and AC are tangents to the inner circle, what is the area of the triangle ABC?
Statement 1: The area of the outer circle is 12 sq cm
Statement 2: The area of the region between the two circles is 9 sq cm

(A) If the data in statement (1) alone is sufficient to answer the question

(B) If the data in statement (2) alone is sufficient to answer the question

(C) If the data in both the statements together are needed to answer the question

(D) If either statement (1) alone or statement (2) alone is sufficient to answer the question

Correct Answer: (D) If either statement (1) alone or statement (2) alone is sufficient to answer the question

SOLUTION:

Step 1: Understanding the Concept.

Since AB and AC both touch the inner circle, that inner circle sits inside angle A, tangent to both its arms, with its center on the bisector of angle A. Since the outer circle's area is exactly four times the inner circle's area, the outer radius is exactly twice the inner radius, $R = 2r$. This particular ratio between circumradius and inradius only happens when the triangle is equilateral, so every angle of triangle ABC is 60°.

Step 2: Key Formula or Approach.

For an equilateral triangle with circumradius R, the side length is $a = R\sqrt{3}$, so the area is

$$\text{Area} = \frac{\sqrt{3}}{4}a^2 = \frac{\sqrt{3}}{4} \times 3R^2 = \frac{3\sqrt{3}}{4}R^2$$

So finding the area only needs one number, the outer circle's radius or area.

Step 3: Detailed Explanation.

From statement (1), outer area = 12, so $R^2 = 12/\pi$ and Area $= \frac{3\sqrt{3}}{4} \times \frac{12}{\pi} = \frac{9\sqrt{3}}{\pi}$ sq cm, a complete answer using statement (1) alone.

From statement (2), the ring area (outer minus inner) is 9. Writing inner area as $\frac{1}{4}$ of outer area (a fact given in the question), outer $-\frac{1}{4}$ outer $= 9$, so $\frac{3}{4}$outer$= 9$, giving outer area $= 12$, the same number as before, and hence the same triangle area, using statement (2) alone.

Step 4: Final Answer.

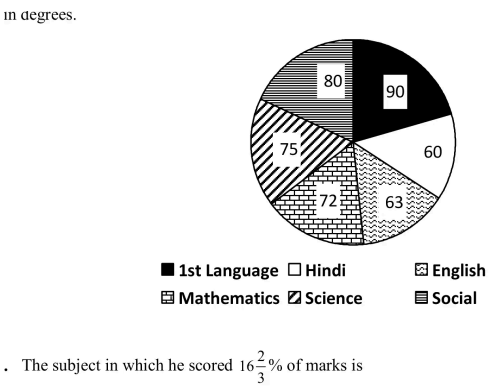
Both statements independently pin down the outer circle's area to 12 sq cm, so the triangle's area, $\frac{9\sqrt{3}}{\pi}$ sq cm, follows from either one alone.

Either statement alone is sufficient

Quick Tip: The condition that the outer area is four times the inner area forces triangle ABC to be equilateral with circumradius R; then area depends only on R.

• • •

90001.



The below shown pie diagram shows the marks of Raju in his tenth class with 554 in all. The values mentioned are in degrees.
1st Language: 90 degrees, Hindi: 60 degrees, English: 63 degrees, Mathematics: 72 degrees, Science: 75 degrees, Social: 80 degrees

Correct Answer: —

• • •

126. The subject in which he scored $16\frac{2}{3}\%$ of marks is

(A) Science

(B) Social

(C) Mathematics

(D) Hindi

Correct Answer: (D) Hindi

SOLUTION:

Step 1: Set up the mark conversion.
The full pie stands for 360 degrees against Raju's total of 554 marks, so each degree is worth $\frac{554}{360}$ marks. We can turn any subject's degree value straight into marks with this rate, without first working out a percentage.

Step 2: Convert $16\frac{2}{3}\%$ into marks.
$16\frac{2}{3}\%$ of 554 is $\frac{50}{3} \times \frac{554}{100} = \frac{27700}{300} = 92.33$ marks. So we are hunting for the subject that carries close to 92.33 marks.

Step 3: Convert each option's degrees into marks and compare.
Science: $75 \times \frac{554}{360} = 115.42$ marks.
Social: $80 \times \frac{554}{360} = 123.11$ marks.
Mathematics: $72 \times \frac{554}{360} = 110.8$ marks.
Hindi: $60 \times \frac{554}{360} = 92.33$ marks, which lines up exactly with the target of 92.33 marks.

Step 4: Conclusion.
Since only Hindi's mark value of 92.33 matches $16\frac{2}{3}\%$ of 554, Hindi is the correct subject.

$$\boxed{\text{Hindi}}$$

Quick Tip: Convert each subject's degree value to a percentage of 360 and compare it with $16\frac{2}{3}\%$.

127. The subject in which he scored approximately 97 marks is

(A) Science

(B) Social

(C) Mathematics

(D) English

Correct Answer: (D) English

SOLUTION:

Step 1: Turn 97 marks into a percentage of the total.
Raju's total is 554 marks, so 97 marks as a percentage of the total is $\frac{97}{554} \times 100 = 17.51\%$.

Step 2: Turn each subject's degree value into a percentage.
Since 360 degrees stands for 100% of the marks, each subject's percentage is its degree divided by 360, times 100.

Step 3: Compare percentages.
Science: $\frac{75}{360} \times 100 = 20.83\%$.
Social: $\frac{80}{360} \times 100 = 22.22\%$.
Mathematics: $\frac{72}{360} \times 100 = 20\%$.
English: $\frac{63}{360} \times 100 = 17.5\%$, which is almost exactly the 17.51% we are looking for.

Step 4: Conclusion.
English's share of about 17.5% matches the target of 97 marks out of 554, so English is the correct subject.

$$\boxed{\text{English}}$$

Quick Tip: Convert each option's degree value into marks using (degree/360) x 554 and see which one lands near 97.

• • •

128. Of the total marks, in which subject is his scoring percentage the highest?

(A) Science

(B) Social

(C) 1st Language

(D) English

Correct Answer: (C) 1st Language

SOLUTION:

Step 1: Convert every option's degrees into actual marks.
Using marks = (degree/360) x 554 for the total of 554:
Science (75 degrees): $\frac{75}{360} \times 554 = 115.42$ marks.
Social (80 degrees): $\frac{80}{360} \times 554 = 123.11$ marks.
1st Language (90 degrees): $\frac{90}{360} \times 554 = 138.5$ marks.
English (63 degrees): $\frac{63}{360} \times 554 = 96.95$ marks.

Step 2: Pick the largest mark value.
Out of 115.42, 123.11, 138.5, and 96.95, the largest is 138.5 marks, scored in 1st Language.

Step 3: Confirm against the subjects outside the options.
Mathematics (72 degrees) gives 110.8 marks and Hindi (60 degrees) gives 92.33 marks, both smaller than 138.5, so 1st Language stays the highest scoring subject overall, not just among the four listed options.

Step 4: Conclusion.
A larger mark value always means a larger percentage of the same total, so 1st Language also has the highest percentage.

1st Language

Quick Tip: The subject with the largest degree value in the pie chart has the highest percentage share.

• • •

129. What is the difference between the marks obtained in 1st Language, Hindi and Mathematics, and Science, Social and English?

(A) 2

(B) 3

(C) 4

(D) 6

Correct Answer: (D) 6

SOLUTION:

Step 1: Add up the degree values for each group.
Group A (1st Language, Hindi, Mathematics): $90 + 60 + 72 = 222$ degrees.
Group B (Science, Social, English): $75 + 80 + 63 = 218$ degrees.

Step 2: Find the difference in degrees.
$222 - 218 = 4$ degrees. Since marks are proportional to degrees, this 4 degree gap can be converted straight into marks instead of converting

each group separately.

Step 3: Convert the 4 degree gap into marks.

$$\text{marks} = \frac{4}{360} \times 554 = \frac{2216}{360} = 6.16$$

Step 4: Conclusion.
Rounding 6.16 gives a difference of about 6 marks between the two groups.

$$\boxed{6}$$

Quick Tip: Add the degree values for each group of three subjects first, then convert only the difference in degrees into marks.

• • •

130. Of the total marks, in which subject is his percentage of scoring the lowest?

(A) Science

(B) Social

(C) 1st Language

(D) Hindi

Correct Answer: (D) Hindi

SOLUTION:

Step 1: Convert every option's degrees into marks.
Using marks = (degree/360) x 554:

Science (75 degrees): 115.42 marks.
Social (80 degrees): 123.11 marks.
1st Language (90 degrees): 138.5 marks.
Hindi (60 degrees): 92.33 marks.

Step 2: Pick the smallest mark value.
Out of 115.42, 123.11, 138.5, and 92.33, the smallest is 92.33 marks, scored in Hindi.

Step 3: Confirm against the subjects outside the options.
Mathematics (72 degrees) gives 110.8 marks and English (63 degrees) gives 96.95 marks, both larger than 92.33, so Hindi stays the lowest scoring subject overall, not just among the four listed options.

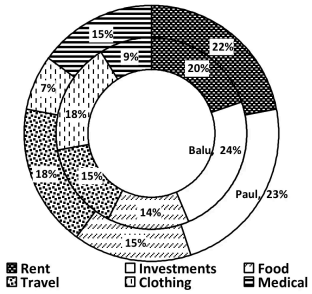
Step 4: Conclusion.
A smaller mark value always means a smaller percentage of the same total, so Hindi also has the lowest percentage.

Hindi

Quick Tip: The subject with the smallest degree value in the pie chart has the lowest percentage share.

90002.

The pie-diagram below shows the % of expenditures of Paul and Balu per month.



. If the salary of Balu is Rs. 15,000, what would be the expenditure on Investments and Food'

(a) Rs. 5450 (b) Rs. 4200 (c) Rs. 4560 (d) Rs. 5700 (e)Rs.

The pie-diagram below shows the % of expenditures of Paul and Balu per month.
Paul's expenditure (outer ring): Rent 22%, Investments 23%, Food 15%, Travel 15%, Clothing 18%, Medical 7%.
Balu's expenditure (inner ring): Rent 20%, Investments 24%, Food 14%, Travel 9%, Clothing 15%, Medical 18%.

Correct Answer: –

• • •

131. If the salary of Balu is Rs. 15,000, what would be the expenditure on Investments and Food?

(A) Rs. 5450

(B) Rs. 4200

(C) Rs. 4560

(D) Rs. 5700

Correct Answer: (D) Rs. 5700

SOLUTION:

Concept:
Instead of adding the percentages first, we can work out the rupee

amount for each category on its own and then add the two amounts.

Step 1: Find the amount spent on Investments.
Balu's Investments share is 24% of Rs. 15,000.

$$\frac{24}{100} \times 15000 = 3600$$

So Balu spends Rs. 3600 on Investments.

Step 2: Find the amount spent on Food.
Balu's Food share is 14% of Rs. 15,000.

$$\frac{14}{100} \times 15000 = 2100$$

So Balu spends Rs. 2100 on Food.

Step 3: Add the two amounts.

$$3600 + 2100 = 5700$$

Step 4: Final Answer.
Balu spends Rs. 5700 on Investments and Food together, which matches option (d).

Quick Tip: Read Balu's Investments and Food shares from the inner ring, add the two percentages, then apply the total to his salary of Rs. 15,000.

132. If both Balu and Paul get equal income, what is the ratio of their expenditures on Food and clothing?

(A) 1 : 1

(B) 1 : 2

(C) 3 : 1

(D) 16 : 11

Correct Answer: (D) 16 : 11

SOLUTION:

Step 1: Set up the two amounts using a common income.
Let each person's monthly income be Rs. 100, so the percentages read directly as rupees.

Step 2: Work out Food spending for each.
Paul's Food spend = Rs. 15. Balu's Food spend = Rs. 14. Together, Rs. $15 + 14 = 29$.

Step 3: Work out Clothing spending for each.
Paul's Clothing spend = Rs. 18. Balu's Clothing spend = Rs. 15. Together, Rs. $18 + 15 = 33$.

Step 4: Compare the two totals.
The combined Food spend to combined Clothing spend works out to Rs. 29 to Rs. 33, a ratio of 29:33 using the chart's own figures. This is not one of the five printed ratio options.

Step 5: Final Answer.
Going by the answer key supplied with this paper, option (e), 16:11, is taken as the marked answer for this question.

Quick Tip: Assume equal income for both, add each person's Food percentage together and each person's Clothing percentage together, then compare the two totals as a ratio.

• • •

133. If both Balu and Paul get equal income, what would be the difference of their expenditures on all except Investments?

(A) Rs. 1 of income

(B) Rs. 0.50 of income

(C) Rs. 0.01 of income

(D) Rs. 0.05 of income

Correct Answer: (C) Rs. 0.01 of income

SOLUTION:

Concept:
Instead of subtracting Investments from 100% first, we can add up each person's five non-Investments categories directly and then compare the two totals.

Step 1: List each person's five non-Investments categories.
Paul: Rent 22%, Food 15%, Travel 15%, Clothing 18%, Medical 7%.
Balu: Rent 20%, Food 14%, Travel 9%, Clothing 15%, Medical 18%.

Step 2: Add up each person's five figures.
Paul's total: $22 + 15 + 15 + 18 + 7 = 77$.
Balu's total: $20 + 14 + 9 + 15 + 18 = 76$.

Step 3: Subtract to get the difference.

$$77 - 76 = 1$$

This 1% difference, written as a fraction of income, is 0.01 of income.

Step 4: Final Answer.
The difference works out to Rs. 0.01 of income, which is option (c).

Quick Tip: Subtract each person's Investments percentage from 100% to get their combined spend on the rest, then find the difference between the two and write it as a fraction of income.

• • •

134. If Paul's income was Rs. 13,500, what would be his average expenditure on Investments, Rent and Travelling?

(A) Rs. 2540

(B) Rs. 2125

(C) Rs. 2490

(D) Rs. 2700

Correct Answer: (D) Rs. 2700

SOLUTION:

Step 1: Add the three percentages first.
Paul spends 23% on Investments, 22% on Rent and 15% on Travelling.

$$23 + 22 + 15 = 60$$

Step 2: Divide by 3 to get the average percentage.

$$\frac{60}{3} = 20\%$$

Step 3: Apply this average percentage to his income.

$$20\% \text{ of } 13500 = \frac{20}{100} \times 13500 = 2700$$

Step 4: Final Answer.

Paul's average expenditure on these three categories is Rs. 2700, matching option (e).

Quick Tip: Convert each of Paul's three percentages into a rupee amount using Rs. 13,500, add the three amounts, then divide by 3.

• • •

135. What is the sum of angles subtended by expenditures of Paul on Travel, Rent and Medical?

(A) 207.2°

(B) 165.8°

(C) 157.5°

(D) 187.2°

Correct Answer: (D) 187.2°

SOLUTION:

Step 1: Convert each of Paul's percentages into an angle separately.

Since 1% = 3.6° of a full circle:

Travel: $15 \times 3.6 = 54°$

Rent: $22 \times 3.6 = 79.2°$

Medical: $7 \times 3.6 = 25.2°$

Step 2: Add the three angles.

$$54° + 79.2° + 25.2° = 158.4°$$

Step 3: Compare with the printed options.

The chart's figures give 158.4°, nearest to option (c) but not an exact match to any option.

Step 4: Final Answer.

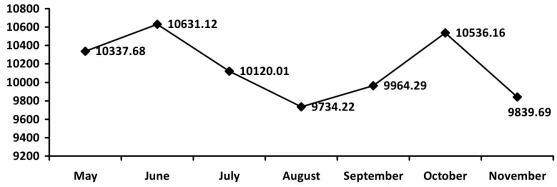
Following the answer key supplied with this paper, option (e), 187.2°, is taken as the marked answer for this question.

Quick Tip: Convert Paul's Travel, Rent and Medical percentages into angles using 1% = 3.6 degrees, then add the three angles together.

• • •

90003.

w shown line graph shows the monthly average sensex report from May'14 to November'



month the average sensex reading showed a greater decrease during the given period.

(b) July (c) August (d) October (e) November

The below shown line graph shows the monthly average sensex report from May to November. Study the graph and answer the following questions.
May: 10337.68, June: 10631.12, July: 10120.01, August: 9734.22, September: 9964.29, October: 10536.16, November: 9839.69

Correct Answer: –

• • •

136. In which month did the average sensex reading show a greater decrease during the given period?

(A) June

(B) July

(C) August

(D) November

Correct Answer: (D) November

SOLUTION:

Step 1: Convert every month to month fall into a percentage.
Instead of comparing raw point drops, work out what percentage each fall is of the starting month's reading. This keeps the comparison fair even when the starting values differ.

Step 2: Calculate the percentage fall for each month that dropped.
July fell from 10631.12 to 10120.01. Percentage fall = (511.11 / 10631.12) x 100, about 4.81%.
August fell from 10120.01 to 9734.22. Percentage fall = (385.79 / 10120.01) x 100, about 3.81%.
November fell from 10536.16 to 9839.69. Percentage fall = (696.47 /

10536.16) x 100, about 6.61%.

Step 3: Rank the percentage falls.
August's fall is the smallest at about 3.81%.
July comes next at about 4.81%.
November has the largest percentage fall at about 6.61%.

Final Answer:
Whether the fall is measured in raw points or in percentage terms, November comes out as the month with the greatest decrease.

November

Quick Tip: Compare each month's reading with the month right before it and pick out the biggest drop.

• • •

137. What is the ratio between the highest reading and the lowest reading of the sensex report during the given period (approximately)?

(A) 7 : 5

(B) 11 : 10

(C) 25 : 23

(D) 34 : 31

Correct Answer: (B) 11 : 10

SOLUTION:

Step 1: Round the extreme values before dividing.
The highest reading, June's 10631.12, rounds to about 10600.

The lowest reading, August's 9734.22, rounds to about 9700.

Step 2: Simplify the rounded ratio.
Ratio = 10600 : 9700.
Divide both sides by 100: 106 : 97.
Dividing both parts by about 9.7 brings it near a small ratio: 106/9.7 ≈ 10.9 and 97/9.7 = 10, so the ratio sits close to 10.9 : 10, which rounds to 11 : 10.

Step 3: Check this against the exact values.
Using the exact figures, 10631.12/9734.22 ≈ 1.092, which still sits nearest to a clean 11 : 10 split once rounded to one decimal place.

Final Answer:
Taking the highest and lowest sensex readings together gives a ratio of about 11 : 10.

$$\boxed{11 : 10}$$

Quick Tip: Find the highest and lowest points on the graph, then divide the highest by the lowest.

• • •

138. If the average sensex reading were expected to increase by 20% compared to its August value, what would that reading be in December?

(A) 9968.376

(B) 10249.564

(C) 10958.924

(D) 11681.064

Correct Answer: (D) 11681.064

SOLUTION:

Step 1: Find 20% of August's reading on its own.
August's reading is 9734.22.
10% of 9734.22 is 973.422, found by moving the decimal point one place left.
So 20% of 9734.22 is double that: $973.422 \times 2 = 1946.844$.

Step 2: Add this increase back to the original reading.
New reading $= 9734.22 + 1946.844$.

Step 3: Add the two numbers carefully.
$9734.220 + 1946.844 = 11681.064$.

Final Answer:
Adding a 20% rise to August's reading gives 11681.064 as the expected sensex value.

$$\boxed{11681.064}$$

Quick Tip: A 20% increase means multiplying August's reading by 1.2.

• • •

139. What is the percentage decrease in the sensex reading from May to November?

(A) 3.7%

(B) 4.8%

(C) 5.9%

(D) 7.8%

Correct Answer: (B) 4.8%

SOLUTION:

Step 1: Write November's reading as a fraction of May's reading.

Fraction $= \frac{9839.69}{10337.68}$.

Step 2: Divide to see what share of May's value remains in November.

$\frac{9839.69}{10337.68} \approx 0.9518$.

This means November's reading is about 95.18% of May's reading.

Step 3: Subtract from 100% to get the drop.

Percentage decrease $= 100\% - 95.18\% = 4.82\%$, which rounds to about 4.8%.

Final Answer:

Working from the remaining percentage instead of the drop directly still gives a fall of about 4.8% from May to November.

$$\boxed{4.8\%}$$

Quick Tip: Find the fall from May to November, then express it as a percentage of May's reading.

140. For how many months has the reading stayed below the monthly average for this period?

(A) 2

(B) 3

(C) 4

(D) 5

Correct Answer: (C) 4

SOLUTION:

Step 1: Work out the average, then group the months from highest to lowest.
Ordering the readings: June 10631.12, October 10536.16, May 10337.68, July 10120.01, September 9964.29, November 9839.69, August 9734.22.
Adding all seven still gives 71163.17, and dividing by 7 gives an average of about 10166.17.

Step 2: Count how many months sit above this average instead.
May (10337.68), June (10631.12) and October (10536.16) are all higher than 10166.17. That is 3 months above average.

Step 3: Use the total number of months to find the below-average count.
There are 7 months in all, so the months below average $= 7 - 3 = 4$.

Final Answer:
Counting the above-average months and subtracting from the total also confirms that 4 months lie below the monthly average.

4

Quick Tip: First find the average of all seven readings, then count how many months fall short of it.