CSIR NET General Aptitude Questions Answers With Solutions

Q1. When a student in Section A who scored 100 marks in a subject is exchanged for a student in Section B who scored 0 marks, the average marks of Section A falls by 4, while that of Section B increases by 5. Which of the following statements is true?
(a) A has the same strength as B
(b) A has 5 more students than B
(c) B has 5 more students than A
(d) The relative strengths of the classes cannot be assessed from the data

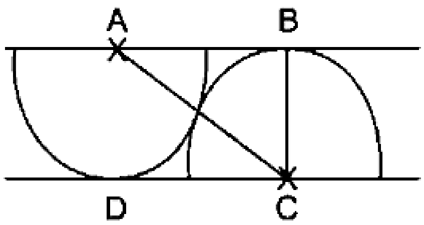
Q2. Which of the numbers A = $162^3 + 327^3$ and B = $612^3 - 123^3$ is divisible by 489?
(a) Both A and B
(b) A but not B
(c) B but not A
(d) Neither A nor B

Q3. At a spot S en-route, the speed of a bus was reduced by 20% resulting in a delay of 45 minutes. Instead, if the speed were reduced at 60 km after S, it would have been delayed by 30 minutes. The original speed, in km/h, was:
(a) 90
(b) 80
(c) 70
(d) 60

Q4. Three consecutive integers a, b, c add to 15. Then the value of $(a - 2)^2 + (b - 2)^2 + (c - 2)^2$ would be:
(a) 25
(b) 27
(c) 29
(d) 31

Q5. Price of an item is increased by 20% of its cost price and is then sold at 10% discount for Rs. 2160. What is its cost price?
(a) 1680
(b) 1700
(c) 1980
(d) 2000

Q6. Two semicircles of the same radii, centered at A and C, touching each other, are placed between two parallel lines, as shown in the figure. The angle BAC is:

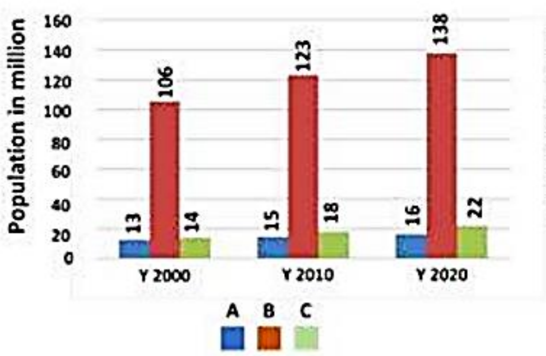


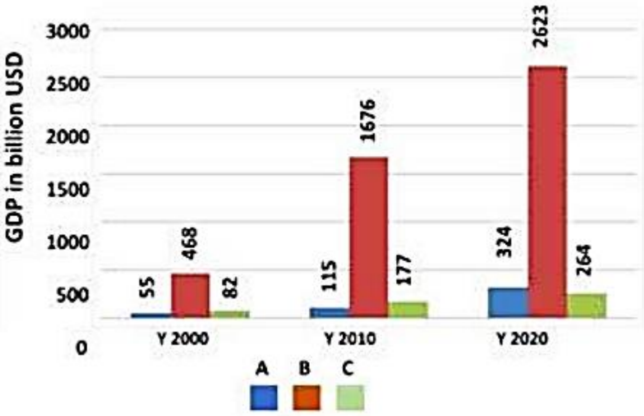
(a) 30°
(b) 35°
(c) 45°
(d) 60°

Q7. What is the largest number of father-son pairs that can exist in a group of four men?
(a) 3
(b) 2
(c) 4
(d) 6

Q8. Three friends having a ball each stand at the three corners of a triangle. Each of them throws their ball independently at random to one of the others, once. The probability of no two friends throwing balls at each other is:
(a) 1/4
(b) 1/8
(c) 1/3
(d) 1/2

Q9. The populations and gross domestic products (GDP) in billion USD of three countries A, B, and C in the years 2000, 2010, and 2020 are shown in the figures.





The decreasing order of per capita GDP of these countries in the year 2020 is:
(a) A, B, C
(b) A, C, B
(c) B, C, A
(d) C, A, B

Q10. Consider two datasets A and B, each with 3 observations, such that both datasets have the same median. Which of the following MUST be true?
(a) Sum of the observations in A = Sum of the observations in B.
(b) Median of the squares of the observations in A = Median of the squares of the observations in B.
(c) The median of the combined dataset = Median of A + Median of B.
(d) The median of the combined dataset = Median of A.

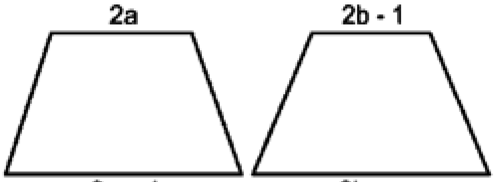
Q11. Three fair cubical dice are thrown independently. What is the probability that all the dice read the same?
(a) 1/6
(b) 1/36
(c) 1/216
(d) 13/216

Q12. Persons A and B have 73 secrets each. On some day, exactly one of them discloses their secret to the other. For each secret A discloses to B in a given day, B discloses two secrets to A on the next day. For each secret B discloses to A in a given day, A discloses four secrets to B on the next day. The one who starts, starts by disclosing exactly one secret. What is the smallest possible number of days it takes for B to disclose all his secrets?
(a) 5
(b) 6
(c) 7
(d) 8

Q13. In a buffet, 4 curries A, B, C, and D were served. A guest was to eat any one or more than one curry, but not the combinations having C and D together. The number of options available for the guest were:
(a) 3
(b) 7
(c) 11
(d) 15

Q14. Sum of all the internal angles of a regular octagon is ___ degrees.
(a) 360
(b) 1080
(c) 1260
(d) 900

Q15. If two trapeziums of the same height, as shown below, can be joined to form a parallelogram of area 2(a + b), then the height of the parallelogram will be:



(a) 4
(b) 1
(c) 1/2
(d) 2

Q16. If the sound of its thunder is heard 1 second after a lightning was observed, how far away (in meters) was the source of thunder/lightning from the observer? (Given: speed of sound = x m/s, speed of light = y m/s)
(a) x^2 / y
(b) $xy / (y - x)$
(c) $xy / (x - y)$
(d) y^2 / x

Q17. A building has windows of sizes 2, 3, and 4 feet, and their respective numbers are inversely proportional to their sizes. If the total number of windows is 26, then how many windows are there of the largest size?
(a) 4
(b) 6
(c) 12
(d) 9

Q18. Given only one full 3-litre bottle and two empty ones of capacities 1 litre and 4 litres, all ungraduated, the minimum number of pourings required to ensure 1 litre in each bottle is:
(a) 2
(b) 3
(c) 4
(d) 5

Q19. A 50-litre mixture of paint is made of green, blue, and red colours in the ratio 5:3:2. If another 10 litres of red colour is added to the mixture, what will be the new ratio?
(a) 5:2:4
(b) 4:3:2
(c) 2:3:5
(d) 5:3:4

Q20. Twenty litres of rainwater having a 2.0 µmol/L concentration of sulfate ions is mixed with forty litres of water having 4.0 µmol/L sulfate ions. If 50% of the total water evaporated, what would be the sulfate concentration in the remaining water?
(a) 3 µmol/L
(b) 3.3 µmol/L
(c) 4 µmol/L
(d) 6.7 µmol/L

Solutions

S1. Ans.(b)
Sol. Given:
A student scoring 100 is exchanged with a student scoring 0.
The average marks of Section A fall by 4.
The average marks of Section B increase by 5.

Concept:
The total change in marks is divided equally among the total number of students in the class. To find the number of students, use the formula:
Number of students = Change in total marks / Change in average marks.
Solution:
Let the number of students in Section A be n.
The total marks of Section A decrease by 100 due to the exchange, and the average decreases by 4.
Therefore, the number of students in Section A is:
n = 100 / 4 = 25.
Let the number of students in Section B be m.
The total marks of Section B increase by 100 due to the exchange, and the average increases by 5.
Therefore, the number of students in Section B is:
m = 100 / 5 = 20.
Comparing the sizes of the two sections, Section A has 5 more students than Section B.
Answer: (b) **A** has 5 more students than **B.**

S2. Ans.(a)
Sol. Given:
1. $A = 162^3 + 327^3$
2. $B = 612^3 - 123^3$
3. $489 = 3 \times 163$

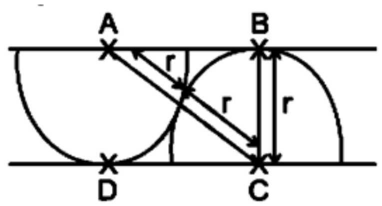
Concept: For a number to be divisible by 489, it must be divisible by both 3 and 163. We will check divisibility for A and B separately.
Solution:
Step 1: Check Divisibility of $A = 162^3 + 327^3$
Divisibility by 3:
Both 162 and 327 are divisible by 3.
Their cubes, 162^3 and 327^3, are also divisible by 3.
Therefore, $A = 162^3 + 327^3$ is divisible by 3.
Divisibility by 163:
When 162 is divided by 163, the remainder is 162.
When 327 is divided by 163, the remainder is 1.
Substitute these into A: $A = 162^3 + 327^3$ becomes $(-1)^3 + 1^3$ modulo 163. $(-1)^3$ is -1, and 1^3 is 1. Adding these gives -1 + 1 = 0 modulo 163.
Since A is divisible by both 3 and 163, A is divisible by 489.
Step 2: Check Divisibility of $B = 612^3 - 123^3$
Divisibility by 3:
Both 612 and 123 are divisible by 3.
Their cubes, 612^3 and 123^3, are also divisible by 3.
Therefore, $B = 612^3 - 123^3$ is divisible by 3.
Divisibility by 163:
When 612 is divided by 163, the remainder is 123.
When 123 is divided by 163, the remainder is 123.
Substitute these into B: $B = 612^3 - 123^3$ becomes $123^3 - 123^3$ modulo 163. This simplifies to 0 modulo 163.
Since B is divisible by both 3 and 163, B is divisible by 489.
Conclusion:
Both A and B are divisible by 489.
Answer: (a) Both A and B

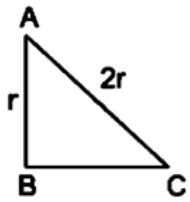
S3. Ans.(d)
Sol. Given:
1. Original speed of the bus = v km/h.
2. Speed was reduced by 20%, so new speed = 0.8v km/h.
3. Delay caused when speed was reduced immediately = 45 minutes = 45/60 hours = 3/4 hours.
4. Delay caused if speed were reduced after 60 km = 30 minutes = 30/60 hours = 1/2 hours.
Concept:
The relationship between distance, speed, and time is given by: Time = Distance / Speed.
The delay caused is the difference between the time taken at reduced speed and the time taken at original speed.
Solution:
Given that the delay occurred because of a 20% reduction in speed, we know that the bus travelled the same distance at two different speeds.
We can equate the two distances using the equation: Distance = Speed x Time. Also, the difference in times taken in each scenario caused the delay.
Let's denote:
Original speed = v km/hr Reduced speed = 0.8v km/hr (because it was reduced by 20%) Distance from the initial point to S = x km Time taken to travel from the initial point to S at original speed,
t1 = x/v hrs Time taken to travel from the initial point to S at reduced speed
t2 = x/(0.8v) hrs The delay caused by the reduction in speed
t2 - t1 = 45 minutes = 45/60 hrs = 0.75 hrs From these observations, we have the equation:
x/(0.8v) - x/v = 0.75
= x (1/(0.8v) - 1/v) = 0.75
= x (1/0.8 - 1)*1/v = 0.75
= x * 0.25/v = 0.75
= x = 3v (Let's call it equation 1)
Now, if the speed were reduced at 60 km after S, the total distance would be x + 60km.
The time taken for traveling this at the original speed = (x+60)/v hrs and for reduced speed = (x+60) /(0.8v) hrs.
The reduced speed delay = [(x+60) /(0.8v)] - [(x+60)/v] = 30 minutes
= 30/60 hours = 0.5 hours.
This gives us a new equation:
(x+60)/(0.8v) - (x+60)/v = 0.5
= (x+60) (1/(0.8v) - 1/v)=0.5
= 0.25(x+60)/v=0.5
= x+60=2v (Let's call it equation 2)
Now we solve equations 1 and 2:
Equation 1 is x = 3v
Equation 2 is x + 60 = 2v
Substitute (3v) from equation 1 to equation 2:
3v+60 = 2v
v = 60 km/hr
So, the original speed is indeed 60 km/hr.
Hence, option (d) 60 is the answer.

S4. Ans.(c)
Sol. Given:
1. a, b, c are three consecutive integers.
2. Their sum is 15: a + b + c = 15.
3. We need to calculate $(a - 2)^2 + (b - 2)^2 + (c - 2)^2$.
Concept:
Consecutive integers can be written as a = x - 1, b = x, c = x + 1, where x is the middle integer. The sum of the integers is (x - 1) + x + (x + 1) = 3x.
Solution:
Step 1: Solve for x
Since a + b + c = 15, 3x = 15, x = 5.
Thus, the integers are: a = 4, b = 5, c = 6.
Step 2: Calculate $(a - 2)^2 + (b - 2)^2 + (c - 2)^2$
1. $(a - 2)^2 = (4 - 2)^2 = 2^2 = 4$.
2. $(b - 2)^2 = (5 - 2)^2 = 3^2 = 9$.
3. $(c - 2)^2 = (6 - 2)^2 = 4^2 = 16$.
Adding these: $(a - 2)^2 + (b - 2)^2 + (c - 2)^2 = 4 + 9 + 16 = 29$.
Conclusion:
The value is 29.
Answer: (c). 29

S5. Ans.(d)
Sol. Given:
Cost price of the item is denoted by CP.
Marked price (MP) is increased by 20% of the cost price, so
MP = CP + 20% of CP = 1.2 × CP.
The item is sold at a 10% discount on the marked price, so
the selling price (SP) = MP - 10% of MP = 90% of MP = 0.9 × MP.
Selling price (SP) = Rs. 2160.
Concept:
We use the relationships among cost price, marked price, and selling price to calculate the cost price (CP).
Solution:
Step 1: Write the relationship for SP
SP = 0.9 × MP. Substitute MP = 1.2 × CP: SP = 0.9 × 1.2 × CP.
SP = 1.08 × CP.
Step 2: Substitute SP = 2160
2160 = 1.08 × CP.
Step 3: Solve for CP
CP = 2160 ÷ 1.08 CP = 2000.
Conclusion:
The cost price of the item is Rs. 2000.
Answer: (d) 2000

S6. Ans.(a)
Sol. Given:
1. Two semicircles of equal radii are placed between two parallel lines.
2. Their centers are A and C.
3. The semicircles touch at point B.
4. AD and DC are radii perpendicular to the parallel lines.
Concept:
1. Points A and C are centers of the semicircles, and the line AC is the distance between the centers.
2. The angle BAC is formed by joining the points A, B, and C.
3. The geometry involves a right triangle, as the lines AD and DC are perpendicular to the parallel lines.
Solution:





Sin ø = BC/AC
Sin ø = r/2r
Sin ø = 1/2
Sin ø = Sin 30
ø = 30
So, The angle BAC is 30o

S7. Ans.(a)
Sol. Concept and Explanation:
In a father-son relationship, one man acts as the father, and another as the son.
In a group of 4 men, every individual can either be a father or a son in a unique pair.
Analyzing the scenario:
1. If one man is the father of all three others, then this forms **3 father-son pairs.** Example: A is the father of B, C, and D.
2. If each man can form a pair with another (i.e., man A is the father of B, man C is the father of D), then only **2 father-son pairs exist.**
3. Beyond **3 pairs**, it's impossible to assign unique relationships because there are only 4 people in total, and overlapping relationships are not allowed.
Conclusion:
The **maximum number of father-son pairs** that can exist in a group of 4 men is **3.**
Answer: (a) 3

S8. Ans.(a)
Sol. Given:
1. There are 3 friends (A, B, C), each standing at the corners of a triangle.
2. Each friend randomly throws their ball to one of the other two.
3. We need to find the probability that no two friends throw balls to each other (no reciprocal throws).
Concept:
1. Total number of ways each friend can throw the ball: Each person has 2 choices (two others to throw to). Total possibilities = 2 × 2 × 2 = 8.
2. Favorable outcomes: We need to count cases where no two friends throw balls at each other (no reciprocal throws like A → B and B → A).
Solution:
Step 1: Total number of possibilities
Each of the 3 friends has 2 independent choices. So, the total number of outcomes is 2 × 2 × 2 = 8.
Step 2: Count favorable outcomes (no reciprocal throws)
For no reciprocal throws:
A throws to either B or C.
B throws to either A or C, but not back to A.
C throws to either A or B, but not back to B.
Using enumeration, favorable outcomes are:
1. A → B, B → C, C → A
2. A → C, C → B, B → A
There are **2 favorable outcomes.**
Step 3: Calculate probability
Probability = Number of favorable outcomes/Total number of outcomes Probability = 2/8 = 1/4.
Conclusion:
The probability of no two friends throwing balls at each other is **1/4**.
Answer: (a) 1/4

S9. Ans.(a)
Sol. Given Data for 2020:
Population (in millions):
A: 16 million
B: 138 million
C: 22 million
GDP (in billion USD):
A: 324 billion
B: 2623 billion
C: 264 billion
Concept:
Per capita GDP = Total GDP / Population.
We calculate the per capita GDP for each country in 2020.

Solution:
1. **For Country A:** GDP = 324 billion USD Population = 16 million Per capita GDP = 324 / 16 = 20.25 thousand USD.
2. **For Country B:** GDP = 2623 billion USD Population = 138 million Per capita GDP = 2623 / 138 ≈ 19.01 thousand USD.
3. **For Country C:** GDP = 264 billion USD Population = 22 million Per capita GDP = 264 / 22 = 12 thousand USD.
Decreasing Order of Per Capita GDP:
A (20.25) > B (19.01) > C (12).
Conclusion:
The decreasing order of per capita GDP is **A, B, C**.
Answer: (a) A, B, C

S10. Ans.(d)
Sol. Concept:
Median of transformed data: The median of a transformed dataset (like squaring the observations in this case) is not necessarily the same as the transformed median.
Median of combined datasets: When combining two datasets, the median of the combined dataset depends on every single observation, not just the medians of the constituent datasets.
Solution:
Sum of the observations in A= Sum of the observations in B:
This is not necessarily true. The median is the middle number when the observations are ordered from least to greatest, it doesn't have any relation to the sum of the observations. Two datasets could have the same median but different sums.
Median of the squares of the observations in A= Median of the squares of the observations in B:
Again, this is not necessarily true. Squaring the observations could change the relative order of the data, and thus it could change the median.
The median of the combined dataset = median of A+ median of B:
This is not necessarily true. The median of a combined dataset depends on the relative ordering of all of the observations, not just the medians of A and B. Adding two medians together does not give the median of the combined dataset.
The median of the combined dataset = median of A:
This is the ONLY true statement subject to the condition that both A and B have an equal number of observations and the median of A is equal to the median of B. When two datasets have the same number of observations and the same median, and you combine them, the median of the combined dataset will remain the same as the original median. This concept is also dependent on the assumption that the datasets A and B are such that any number in A doesn't exceed the median and any number in B isn't less than the median.
When working with the concept of the median, it's important to remember that the median is the middle value of a set when the set is ordered from least to greatest. It isn't affected by the absolute values of the other observations, only by their relative order.

Example to Verify:
Let A = [1, 5, 9] and B = [2, 5, 8].
Median of A = 5, Median of B = 5.
Combined dataset = [1, 2, 5, 5, 8, 9].
Median of combined dataset = (5 + 5) ÷ 2 = 5.
Thus, the median of the combined dataset equals the median of A (and B).
Conclusion:
Option **(d)** is correct: **The median of the combined dataset = median of A.**

S11. Ans.(b)
Sol. Concept:
A single die has 6 faces, each face has an equal probability of appearing on a throw, making it 1/6.
Solution:
When three dice are thrown, the total number of outcomes is the total outcomes for each die multiplied together.
That is, 6 outcomes for the first die,
6 for the second, and
6 for the third,
giving a total of **63 = 216 possible outcomes.**
The event of all three dice reading the same (for instance, all being 1s, 2s, etc.) has 6 possible outcomes: **(1, 1, 1), (2, 2, 2), (3, 3, 3), (4, 4, 4), (5, 5, 5), and (6, 6, 6).**
Therefore, the probability of all three dice reading the same is the number of successful outcomes divided by the total number of outcomes,
in this case,
=6/216
= 1/36.

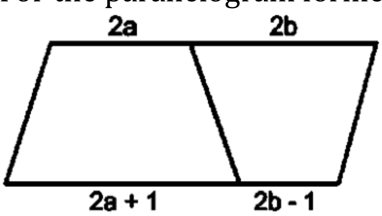
S12. Ans.(a)
Sol. Solution:
According to the question -
Day 1: B discloses 1 secret to A.
Day 2: A, in return, discloses 4 secrets to B.
Day 3: B, in return for those 4 secrets, discloses 4 × 2 = 8 secrets to A.
Day 4: A, in return for those 8 secrets, discloses 8 × 4 = 32 secrets to B.
Day 5: A, in return for those 32 secrets, discloses 32 × 2 = 64 secrets to A.
At this point, B has revealed 1 + 8 + 64 = 73 secrets to A.
So, B got revealed 1 + 8 + 64 = 73 secrets (which is the total of his secrets).
It took 5 days in total for B to disclose all his secrets. Hence option (a) is correct.

S13. Ans.(c)
Sol. Concept:
Total combinations of 4 items (A, B, C, D) = 24−1=15 (excluding the empty set).
The combinations including **both C and D together** must be subtracted from the total.
Solution:
Step 1: Total possible combinations
Total combinations = 24 −1=15 (as each item can either be chosen or not).
These combinations include all subsets of {A, B, C, D} except the empty set.

Step 2: Remove combinations with C and D together
When **C and D are both included**, the remaining options are subsets of {A, B}.
Subsets of {A, B} = 22=4 (including the empty set).
These combinations are:
{C, D}, {A, C, D}, {B, C, D}, {A, B, C, D}.
Thus, 4 combinations include both C and D.
Step 3: Subtract combinations with C and D together
Total combinations = 15.
Combinations with C and D together = 4.
Valid combinations = 15−4=11.
Conclusion:
The number of valid options available for the guest is **11.**

S14. Ans.(b)
Sol. Concept:
A polygon is a closed figure with straight sides. Examples of polygons are triangles, quadrilaterals, pentagons, hexagons, and so on.
If you take a polygon, say, a triangle, you'll notice that it has three angles. The sum of the internal angles of a triangle is always 180 degrees. Now, if you add a side to the triangle and make it a quadrilateral, you can see that it can be divided into two triangles. Therefore, the sum of internal angles in a quadrilateral is **180×2 = 360 degrees.**
Every time you add a side (and therefore form an additional triangle), you're adding another 180 degrees to the sum of the internal angles.
This is what the formula (n-2) × 180, where 'n' is the number of sides, represents.
Solution:
The sum of all the internal angles of a polygon can be found using the formula (n−2) × 180 degrees, where n is the number of sides.
For an octagon, which has eight sides, the sum of all the internal angles is
(8−2) × 180 = 6 × 180 = 1080 degrees
Conclusion: The sum of all internal angles of a regular octagon is **1080 degrees**.

S15. Ans.(b)
Sol. Solution:
When we add both trapeziums, we form a parallelogram as shown in the figure.
Formula:
The area of a trapezium is given as: Area = (1/2) × height × (sum of parallel sides).
For the parallelogram formed by combining two trapeziums, its total area is already given as **2(a + b).**



Calculation:
Parallel sides of the parallelogram:
Adding the bases of the two trapeziums: Parallel sides = (2a + 2b).
Area of the parallelogram: The formula for the area of a parallelogram is: Area = Base × Height.
Substituting values: 2(a + b) = (1/2) × height × (2a + 2b + 2a + 2b).
Simplify the terms: 2(a + b) = (1/2) × height × 4(a + b).
Further simplify: 2(a + b) = height × 2(a + b).
Solve for height: height = [2(a + b)] / [2(a + b)] = 1.
Conclusion:
The height of the parallelogram is **1**.

S16. Ans.(b)
Sol. Solution:
Concept: The source of thunder and lightning is the same. Lightning is observed almost instantly because the speed of light is much faster than the speed of sound. The time difference (1 second) is caused by the slower travel of sound.
Formula for distance: The distance to the source is the same for both light and sound. Distance traveled by sound = x × t (where t is the time taken by sound). Distance traveled by light = y × (t - 1) (where t - 1 is the time taken for light).
Equating distances: Since the distances are the same: x × t = y × (t - 1).
Solve for t: Expand the equation:
x × t = y × t - y. Rearrange terms: t × (y - x) = y. t = y / (y - x).
Calculate the distance: Substitute t into the formula for distance traveled by sound: Distance = x × t.
Distance = x × (y / (y - x)). Distance = xy / (y - x).
Conclusion:
The correct distance is xy / (y - x).

S17. Ans.(b)
Sol. Concept: The number of windows is inversely proportional to their sizes. This means:
Number of windows of size 2 feet is proportional to 1/2.
Number of windows of size 3 feet is proportional to 1/3.
Number of windows of size 4 feet is proportional to 1/4.
Let the proportional constant be k. Then:
Number of windows of size 2 = k / 2
Number of windows of size 3 = k / 3
Number of windows of size 4 = k / 4
Total number of windows: The total number of windows is 26. Hence, (k / 2) + (k / 3) + (k / 4) = 26
Simplify the equation: The least common multiple of the denominators (2, 3, and 4) is 12. Rewrite the equation: (6k / 12) + (4k / 12) + (3k / 12) = 26
Combine terms: (6k + 4k + 3k) / 12 = 26 13k / 12 = 26
Solve for k: Multiply both sides by 12: 13k = 312 k = 312 / 13 = 24
Calculate the number of windows of each size:
Number of windows of size 2 = k / 2 = 24 / 2 = 12
Number of windows of size 3 = k / 3 = 24 / 3 = 8
Number of windows of size 4 = k / 4 = 24 / 4 = 6
Conclusion: The number of windows of the largest size (4 feet) is 6.

S18. Ans.(b)
Sol. Solution:
Initial State:
3-litre bottle: Full (3 litres).
1-litre bottle: Empty (0 litres).
4-litre bottle: Empty (0 litres).
Step-by-Step Process to Get 1 Litre in Each Bottle:
Pour 3 litres from the 3-litre bottle into the 4-litre bottle.
3-litre bottle: Empty (0 litres).
4-litre bottle: 3 litres.
1-litre bottle: Empty (0 litres).
Pour 1 litre from the 4-litre bottle into the 1-litre bottle.
3-litre bottle: Empty (0 litres).
4-litre bottle: 2 litres.
1-litre bottle: Full (1 litre).
Pour 2 litres from the 4-litre bottle back into the 3-litre bottle.
3-litre bottle: 2 litres.
4-litre bottle: Empty (0 litres).
1-litre bottle: Full (1 litre).
Final State:
3-litre bottle: 1 litre remaining.
4-litre bottle: 1 litre.
1-litre bottle: 1 litre.
Total Pourings: Only **3 pourings** are required to achieve the desired state.
Answer: (b) 3

S19. Ans.(d)
Sol. Given:
1. Total mixture = 50 litres.
2. Original ratio of green:blue:red = 5:3:2.
3. Additional red colour = 10 litres.
Solution:
Step 1: Calculate the original quantities of each colour
Since the total volume of the mixture is 50 litres and the ratio is 5:3:2:
Green = (5/10) × 50 = 25 litres.
Blue = (3/10) × 50 = 15 litres.
Red = (2/10) × 50 = 10 litres.
Step 2: Add 10 litres of red
After adding 10 litres of red, the new quantities are:
Green = 25 litres.
Blue = 15 litres.
Red = 10 + 10 = 20 litres.

Step 3: Find the new ratio
The new ratio of green:blue:red is: Green = 25, Blue = 15, Red = 20.
To simplify:
Divide each quantity by the greatest common divisor (GCD), which is 5.
Green = 25 ÷ 5 = 5.
Blue = 15 ÷ 5 = 3.
Red = 20 ÷ 5 = 4.
The new ratio is 5:3:4.
Conclusion:
The new ratio of green, blue, and red is 5:3:4.
Answer: d. 5:3:4

S20. Ans.(d)
Sol. Solution:
Step 1: Total moles of sulfate ions before mixing
Rainwater: Volume = 20 L, concentration = 2.0 μmol/L Total moles from rainwater = 20 × 2.0 = 40 μmol
Water: Volume = 40 L, concentration = 4.0 μmol/L Total moles from water = 40 × 4.0 = 160 μmol
Total moles of sulfate ions = 40 + 160 = 200 μmol
Step 2: Total volume before evaporation
Total volume = 20 + 40 = 60 L
Step 3: Evaporation effect
50% of the water evaporates, so the remaining volume = 60/2 = 30 L
The total moles of sulfate ions remain the same (200 μmol) because evaporation removes only water, not solutes.
Step 4: New concentration after evaporation
Concentration = Total moles / Remaining volume
Concentration = 200 / 30 = 6.7 μmol/L
Conclusion:
The sulfate concentration in the remaining water is **6.7 μmol/L**.
Answer: (d) 6.7 μmol/L