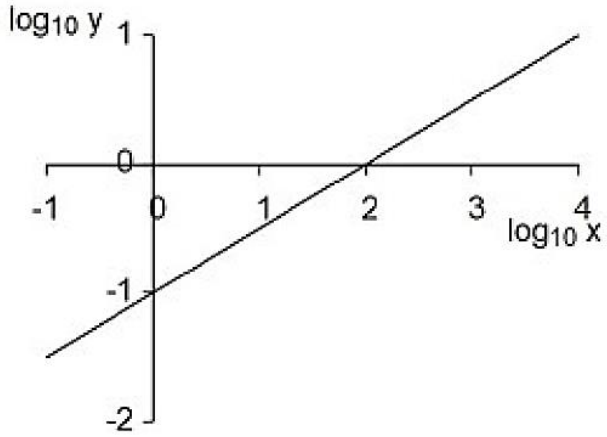
CSIR NET General Aptitude Questions Answers With Solutions

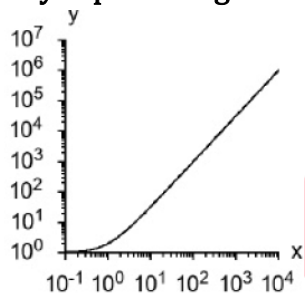
Q1. A person's viral load measured in some unit was 15, 25, 50, 200, 300, 150 and 30 on days 1 to 7, respectively. The maximum relative change took place between 2.0

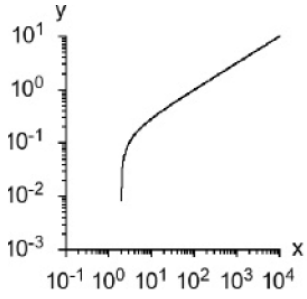
(a) day 3 to day 4.
(b) day 4 to day 5.
(c) day 5 to day 6.
(d) day 6 to day 7.

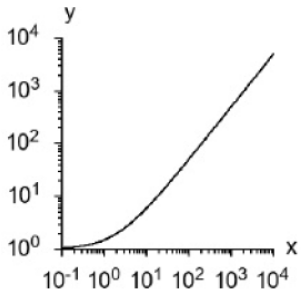
Q2. In the figure $\log_{10}y$ is plotted against $\log_{10}x$

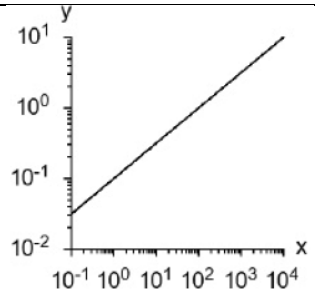


When y is plotted against x, then the plot in the provided range is

(a)


(b)


(c)


(d) 

Q3. In a market, you can buy a mango for Rs.10, a lemon for Re 1 and 8 chillies for Re 1. How many of these items do you need to buy to get a mix of 100 items for exactly Rs. 100?

(a) 6 mangoes, 22 lemons, 72 chillis

(b) 7 mangoes, 21 lemons, 72 chillis

(c) 1 mango, 9 lemons, 80 chillis

(d) 8 mangoes, 12 lemons, 80 chillis

Q4. SCRIPT: DIRECTOR :: ??: CHEF

Choose the most appropriate option from the following to fill the blank

(a) MENU

(b) RECIPE

(c) RESTAURANT

(d) MEAL

Q5. What is the value of x in the given magic square. (i.e, a square grid in which the sum of the numbers in rows, columns and diagonals is the same)?

x	x-5	8
x+1	y	y-2
2	9	4

(a) 6

(b) 4

(c) 3

(d) 1

Q6. What is the minimum number of pourings needed to get 4 litre of milk from a fully filled 8 litre can, using ungraduated empty 5 and 3 litre cans? No milk should be wasted.

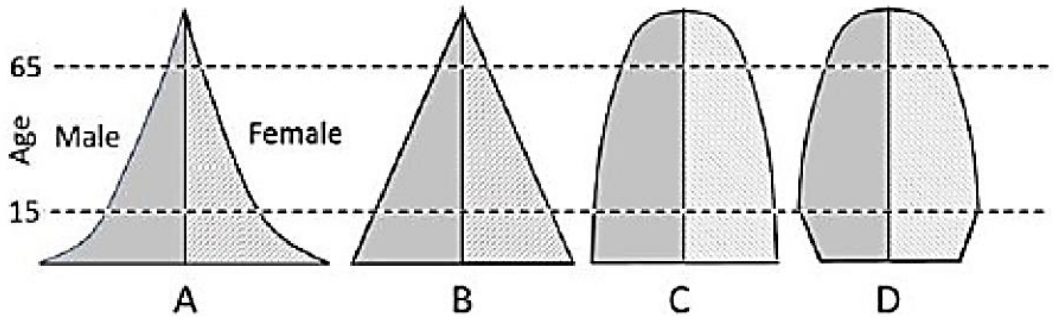
(a) 4

(b) 5

(c) 6

(d) 8

Q7.



The above figures show population pyramids to four countries A, B, C and D. The country showing the most stable population is

(a) C
(b) A
(c) B
(d) D

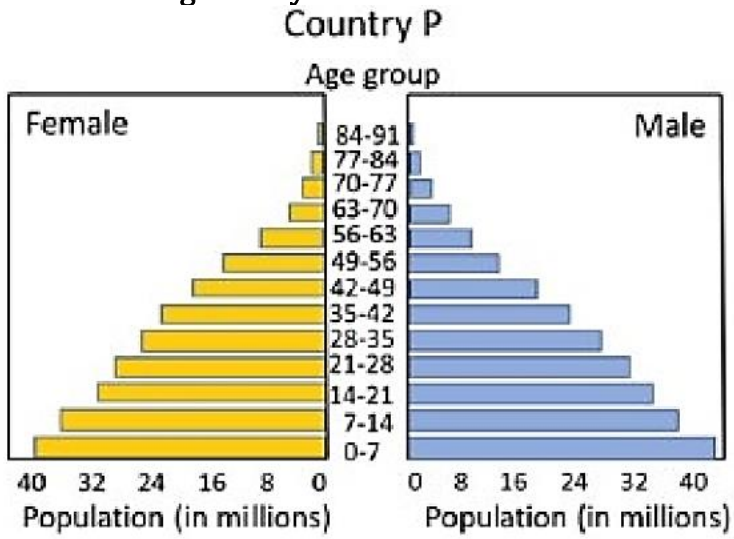
Q8. For every 5 chocolates that Ramesh gets, Suresh gets 3 chocolates. Geeta gets 3 chocolates for every 2 chocolates that Suresh gets. If Geeta has 18 chocolates, then the sum of chocolates with Ramesh and Suresh is

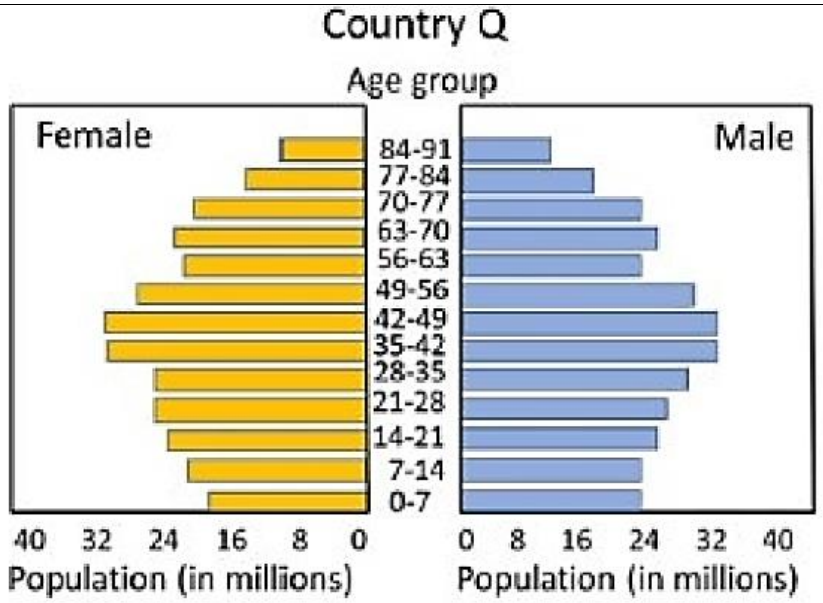
(a) 16
(b) 30
(c) 32
(d) 38

Q9. The time seen in a mirror placed opposite a numberless analog (with hands) wall clock is 4 h 55 min. What approximately is the correct time?

(a) 4 h 55 min
(b) 5 h 05 min
(c) 7 h 05 min
(d) 1 h 35 min

Q10. The figure shows age-wise bar graph of male and female population of two countries. Which one of the following is likely to be true?





(a) Country Q has higher life expectancy
(b) Country P has higher per-capita income
(c) The population of country P is decreasing more rapidly than Q
(d) Country P has better health facilities

Q11. Radius of a sphere is measured with 5% uncertainty. What is the uncertainty in the volume, determined from this radius?
(a) 5%
(b) 6.6%
(c) 125%
(d) 15%

Q12. If $a < x < b$ then for which of the following relations does $0 < y < 1$ always hold?
(a) $y = (a - x)/(b + a)$
(b) $y = (x - a)/(b - a)$
(c) $y = (x - b)/(b - a)$
(d) $y = (b - x)/(a + b)$

Q13. A letter is drawn at random from the following string of letters.
R A M U K Y A J N A S
What is the probability that it is NOT a vowel?
(a) 1/2
(b) 6/11
(c) 7/11
(d) 8/11

Q14. Four children had 27 apples among them. No child had less than 5 apples. If no two children had the same number of apples, then which of the following could NOT be the number of apples a child had?
(a) 5
(b) 6
(c) 8
(d) 9

Q15. All the four entries in column A must be matched with all those in column B. Each correctly matched option gets one mark and no mark is awarded otherwise. Which of the following mark(s) CANNOT be scored?
(a) 3
(b) 1
(c) 2
(d) 4

Q16. A truck from a post office is sent to collect post from a plane as per schedule. The plane lands ahead of schedule, therefore its contents are transported by a rickshaw. The rickshaw meets the truck 30 minutes after the arrival of plane, and the post is transferred. The truck returns to the post office 20 minutes early. How early did the plane arrive? (Assume all transactions are instantaneous.)
(a) 10 minutes
(b) 20 minutes
(c) 30 minutes
(d) 40 minutes

Q17. In 1979, Ramesh's age was the sum of the digits of his year of birth. In 2017, on his birthday, what was his age?
(a) 49
(b) 57
(c) 60
(d) 64

Q18. The sum of the two positive integers is 14. Then their product CANNOT be divisible by
(a) 12
(b) 13
(c) 14
(d) 49

Q19. In how many ways can a menu be made from 5 dishes, if the menu contains either 3 or 4 dishes?
(a) 2
(b) 3
(c) 7
(d) 15

Q20. A bird keeps flying continuously between two trains, that are following each other on a straight track. The train behind is slower than the one ahead by 1.5 km/h. If the speed of the bird is 20 km/h. what distance would the bird cover in an hour?
(a) 20 km
(b) 30 km
(c) 50 km
(d) 60 km

Solutions

S1. Ans.(a)

Sol. To determine the **maximum relative change** in the viral load, we need to calculate the relative change between the measurements for each consecutive day.

The relative change is calculated using the following formula:

$$\text{Relative Change} = \frac{\text{New Value} - \text{Old Value}}{\text{Old Value}}$$

Given viral load measurements on days 1 to 7:

Viral Load=[15,25,50,200,300,150,30]\text{Viral Load} = [15, 25, 50, 200, 300, 150, 30]Viral Load=[15,25,50,200,300,150,30]

Let's calculate the relative change for each consecutive pair of days:

1. From Day 1 to Day 2:

Relative Change=25−1515=1015=0.6667(66.67%)Relative Change=1525−15=1510=0.6667(66.67%)

2. From Day 2 to Day 3:

Relative Change=50−2525=2525=1.0(100%)Relative Change=2550−25=2525=1.0(100%)

3. From Day 3 to Day 4:

Relative Change=200−5050=15050=3.0(300%)Relative Change=50200−50=50150=3.0(300%)

4. From Day 4 to Day 5:

Relative Change=300−200200=100200=0.5(50%)Relative Change=200300−200=200100=0.5(50%)

5. From Day 5 to Day 6:

Relative Change=150−300300=−150300=−0.5(−50%)Relative Change=300150−300=300−150=−0.5(−50%)

6. From Day 6 to Day 7:

Relative Change=30−150150=−120150=−0.8(−80%)Relative Change=15030−150=150−120=−0.8(−80%)

Maximum Relative Change took place between Day 3 and Day 4:300%Maximum Relative Change took place between Day 3 and Day 4: 300%

Conclusion:

The **maximum relative change** occurred between **Day 3 and Day 4**, where the viral load increased from 50 to 200. This represents a **300%** increase.

Thus, the maximum relative change took place between **Day 3 and Day 4**.

Relative Change=New Value−Old ValueOld Value\text{Relative Change} = \frac{\text{New Value} - \text{Old Value}}{\text{Old Value}}

S2. Ans.(a)

Sol. The given figure shows a plot of $\log_{10}(y)$ against $\log_{10}(x)$, which is a straight line.

This indicates a **logarithmic relationship** between **y** and **x**.

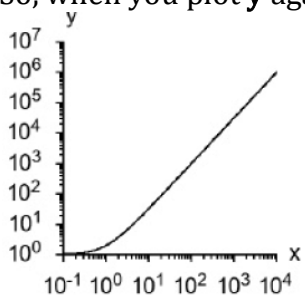
When you plot **y** against **x** directly (i.e., removing the logarithms), you expect a **power law relationship**.

Given that the plot of $\log_{10}(y)$ vs $\log_{10}(x)$ is a straight line, this implies that: $\log_{10} y = m\log_{10} x + c$

which translates to:

$y = 10_c . x_m$

So, when you plot **y** against **x** directly, it will follow a **power law curve**,



which typically starts with a steep rise and gradually becomes less steep as **x** increases.

Answer:

The correct plot when **y** is plotted against **x** is **(a)**.

S3. Ans.(b)

Sol. Given:

- **Mango** costs Rs. 10 each.
- **Lemon** costs Rs. 1 each.
- **8 chillies** cost Rs. 1, which means each chilli costs Rs. 1/8.

We need to buy exactly 100 items for Rs. 100. Let's define:

- **x** as the number of mangoes.
- **y** as the number of lemons.
- **z** as the number of chillies.

Solution:

We have two conditions:

1. The total number of items must be 100:$x + y + z = 100$
2. The total cost must be Rs. 100:$10x + y + (z / 8) = 100$

Eliminate the fraction

To get rid of the fraction, multiply the second equation by 8:

$8 * (10x + y + z / 8) = 8 * 10080x + 8y + z = 800$

So, now we have the system:

1. $x + y + z = 100$
2. $80x + 8y + z = 800$

Solve the system of equations

Subtract the first equation from the second:

$(80x + 8y + z) - (x + y + z) = 800 - 10079x + 7y = 700$

Solve for y in terms of x

Now, solve for y:

$7y = 700 - 79xy = (700 - 79x) / 7$

For y to be an integer, the numerator (700 - 79x) must be divisible by 7. Let's check when 700 - 79x is divisible by 7.

Check for integer solutions

We know that 700 is divisible by 7. Also, 79 mod 7 gives a remainder of 2. Therefore, we need:

$700 - 79x \equiv 0 \pmod 7 \text{or} 2x \equiv 0 \pmod 7$

Since 2 and 7 are coprime, x must be a multiple of 7. Let's try different multiples of 7 for x.

Try $x = 7$

Substitute $x = 7$ into the equation for y:

$y = (700 - 79 * 7) / 7 = (700 - 553) / 7 = 147 / 7 = 21$

So, $y = 21$.

Now, substitute x = 7 and y = 21 into the first equation:
x + y + z = 1007 + 21 + z = 100z = 100 - 28 = 72
Verify the solution
Finally, check the total cost:

- Mangoes: 7 * 10 = 70
- Lemons: 21 * 1 = 21
- Chillies: 72 / 8 = 9

The total cost is 70 + 21 + 9 = 100, which satisfies the requirement.
Final Answer:
To get a mix of 100 items for exactly Rs. 100, you need to buy:

- **7 mangoes**
- **21 lemons**
- **72 chillies**.

S4. Ans.(b)
Sol. The correct analogy would be:
CHEF : RECIPE
A **chef** is responsible for the **recipe**, just as a **director** is responsible for the **script**.
Thus, the correct option is:
CHEF : RECIPE

S5. Ans.(a)
Sol. Given:
We have a magic square where the sum of numbers in each row, column, and diagonal is the same. We need to find the value of x.
Solution:
The numbers in the magic square are arranged as follows:
Row 1: x, x - 5, and 8
Row 2: x + 1, y, and y - 2
Row 3: 2, 9, and 4
From Row 3, we can calculate the "magic sum" since all values in this row are known:
The sum of Row 3 is:
2 + 9 + 4 = 15
Therefore, each row, column, and diagonal must add up to 15.
Calculate Row 1 Using the Magic Sum:
For Row 1, we have the expression:
x + (x - 5) + 8 = 15
Simplify by combining like terms:
2x + 3 = 15
Subtract 3 from both sides:
2x = 12
Divide by 2:
x = 6
Verification with x = 6:
Row 1: With x = 6, the entries become 6, 1 (since x - 5 = 1), and 8.
Sum = 6 + 1 + 8 = 15, which matches the magic sum.
Row 2: Substitute x = 6 to get the entries 7 (since x + 1 = 7), y, and y - 2.

Since the sum must be 15, set up the equation:
$7 + y + (y - 2) = 15$
Simplify to get:
$2y + 5 = 15$
Subtract 5 from both sides:
$2y = 10$
Divide by 2 to find y:
$y = 5$
Row 3: This row already sums to 15 ($2 + 9 + 4 = 15$).
Verification of Columns and Diagonals:
Column 1: Entries are 6, 7, and 2.
Sum: $6 + 7 + 2 = 15$
Column 2: Entries are 1, 5, and 9.
Sum: $1 + 5 + 9 = 15$
Column 3: Entries are 8, 3, and 4.
Sum: $8 + 3 + 4 = 15$
Diagonal 1 (top left to bottom right): Entries are 6, 5, and 4.
Sum: $6 + 5 + 4 = 15$
Diagonal 2 (top right to bottom left): Entries are 8, 5, and 2.
Sum: $8 + 5 + 2 = 15$
Since all rows, columns, and diagonals sum to 15 when $x = 6$ and $y = 5$, this confirms the solution.
Answer: The correct value of x is 6.

S6. Ans.(c)
Sol. We are given a fully filled 8-litre can and ungraduated empty 5-litre and 3-litre cans. We need to get exactly 4 litres of milk, without wasting any.
To solve this, we will follow a step-by-step procedure using the minimum number of pourings.
Step-by-step process:

1. **Fill the 5-litre can from the 8-litre can**:
   - Now the 5-litre can has 5 litres, and the 8-litre can has 3 litres remaining.
   - Pouring count: 1
2. **Pour the 5 litres from the 5-litre can into the 3-litre can**:
   - The 3-litre can is now full, and 2 litres remain in the 5-litre can.
   - Pouring count: 2
3. **Empty the 3-litre can**:
   - Now the 3-litre can is empty.
   - Pouring count: 3
4. **Pour the 2 litres from the 5-litre can into the 3-litre can**:
   - The 3-litre can now contains 2 litres.
   - Pouring count: 4
5. **Fill the 5-litre can again from the 8-litre can**:
   - Now the 5-litre can contains 5 litres, and the 8-litre can has 0 litres remaining.
   - Pouring count: 5
6. **Pour from the 5-litre can into the 3-litre can (which already contains 2 litres)**:
   - The 3-litre can will take 1 litre to become full, leaving 4 litres in the 5-litre can.
   - Pouring count: 6

Now we have 4 litres in the 5-litre can.
Conclusion:
The minimum number of pourings required to get exactly 4 litres is **6**.
Thus, the correct answer is **(c) 6**.

S7. Ans.(a)
Sol. Analysis of Population Pyramids:
Pyramid A: It has a wide base and a narrow top, indicating a high birth rate and a high death rate, which is typical of a growing population. This shape suggests a less stable population with a youthful age structure.
Pyramid B: Similar to Pyramid A, it has a triangular shape with a broad base. This also reflects a young population with high birth and death rates, indicative of a less stable and growing population.
Pyramid C: This pyramid has a more rectangular shape, with a relatively even distribution across age groups, suggesting lower birth and death rates. A rectangular shape typically indicates a stable population with slow growth, as each age group is nearly the same size.
Pyramid D: This pyramid has a narrow base and a slightly wider top, which might indicate a declining birth rate and an aging population. However, it does not represent a stable population, as it suggests a population potentially declining over time.
Conclusion: The most stable population is shown by Pyramid C because it has a rectangular shape, indicating a balanced population with low birth and death rates and an even distribution across age groups.
Answer: (1) C

S8. Ans.(c)
Sol. Given:
- **RameshSuresh**For every 5 chocolates that gets, gets 3 chocolates.
- **GeetaSuresh** gets 3 chocolates for every 2 chocolates that gets.
- Geeta has 18 chocolates.

Step 1: Relationship between Geeta and Suresh
We know that for every 2 chocolates that Suresh gets, Geeta gets 3 chocolates. Since Geeta has 18 chocolates, we can set up the proportion:
- If Suresh gets 2 chocolates, Geeta gets 3 chocolates.
- If Suresh gets "x" chocolates, Geeta gets 18 chocolates.

So, we can write the proportion as:
(2 / 3) = (x / 18)
Now, solve for "x":
x = (2 * 18) / 3 = 36 / 3 = 12
So, Suresh gets 12 chocolates.
Step 2: Relationship between Suresh and Ramesh
Next, we know that for every 3 chocolates Suresh gets, Ramesh gets 5 chocolates. Since Suresh has 12 chocolates, we can use this information to determine how many chocolates Ramesh gets.
- If Suresh gets 3 chocolates, Ramesh gets 5 chocolates.
- If Suresh gets 12 chocolates, Ramesh gets "y" chocolates.

So, we can set up the proportion:
(3 / 5) = (12 / y)
Now, solve for "y":
y = (5 * 12) / 3 = 60 / 3 = 20
So, Ramesh gets 20 chocolates.

Step 3: Total chocolates with Ramesh and Suresh
Now, to find the total number of chocolates with Ramesh and Suresh, we add the chocolates they each have:
20 (Ramesh) + 12 (Suresh) = 32 chocolates.
Final Answer:
The sum of chocolates with Ramesh and Suresh is **32 chocolates**.

S9. Ans.(c)
Sol. When looking at the time displayed on a **mirror** reflection of an analog clock, the positions of the hour and minute hands appear reversed. To find the correct time, we need to account for this reversal.
Step-by-step process:
1. **Given time in the mirror**: 4 hours 55 minutes.
   - In the mirror, the time looks like 4:55.
2. **Reflecting the hands across the vertical axis**:
   - To correct for the mirror image, we need to "reverse" the clock. This involves subtracting the time shown in the mirror from 12:00.
3. **Calculate the correct time**:
   - The time in the mirror is 4:55.
   - The time on the actual clock can be found by subtracting the time in the mirror from 12:00.

12:00−4:55=7:0512:00 - 4:55 = 7:0512:00−4:55 = 7:05
So, the correct time is approximately **7:05**.
Explanation:
- When you look at a mirror reflection of a clock, the hour hand that was on 4 will appear as if it is on 8, and
- the minute hand that was on 55 will look like it's on 5. The time is essentially the "reverse" of 4:55, which leads us to 7:05.

S10. Ans.(a)
Sol. Observations:
1. **Country P (Graph)**:
   - A **pyramid-shaped population structure** with a very broad base indicates a high birth rate and rapid population growth in younger age groups.
   - The population sharply declines in older age groups, indicating lower life expectancy.
   - This is typical of developing countries where healthcare and other social support systems may not be as advanced.
2. **Country Q (Graph)**:
   - A **more balanced age distribution** compared to Country P, with a larger proportion of the population in older age groups.
   - This suggests higher life expectancy and possibly better healthcare, education, and economic development.

Analysis of Statements:
1. **(a) Country Q has higher life expectancy**:
   - This is supported by the balanced population pyramid of Country Q, where a larger percentage of people survive into older age groups.
   - **LIKELY TRUE**.

2. **(b) Country P has higher per-capita income**:
   - A high birth rate and a young population generally indicate a developing economy with lower per-capita income.
   - **UNLIKELY TRUE**.
3. **(c) The population of Country P is decreasing more rapidly than Q**:
   - Country P's broad base indicates rapid population growth in younger groups, not a population decrease.
   - **FALSE**.
4. **(d) Country P has better health facilities**:
   - Country Q's population pyramid reflects better longevity and distribution, which likely indicates better healthcare in Country Q, not Country P.
   - **FALSE**.

Final Answer:
(a) Country Q has higher life expectancy.

S11. Ans.(d)
Sol. To find the uncertainty in the volume of a sphere based on the uncertainty in its radius, we can use the concept of **propagation of uncertainty**.
The formula for the volume VVV of a sphere is:$V=43\pi r3V=34\pi r3$
Where:
- VVV is the volume of the sphere,
- rrr is the radius of the sphere.

Step 1: Uncertainty Propagation
The uncertainty in the volume can be related to the uncertainty in the radius using the following formula:$\Delta VV=3\cdot\Delta rrV\Delta V=3\cdot r\Delta r$
Where:
- $\Delta V\backslash Delta\ V\Delta V$ is the uncertainty in the volume,
- VVV is the volume of the sphere,
- $\Delta r\backslash Delta\ r\Delta r$ is the uncertainty in the radius,
- rrr is the radius of the sphere.

Step 2: Given Uncertainty in Radius
The problem states that the uncertainty in the radius is 5%, which means:$\Delta rr=0.05r\Delta r=0.05$
Step 3: Calculate Uncertainty in Volume
Using the formula for propagation of uncertainty:$\Delta VV=3\cdot0.05=0.15V\Delta V=3\cdot0.05=0.15$
Thus, the uncertainty in the volume of the sphere is 15%.
Final Answer: The uncertainty in the volume of the sphere is **15%**.

S12. Ans.(b)
Sol. Option Analysis:
1. **Option a:** $y = (a - x) / (b + a)$
   - For $a < x < b$, the term $(a - x)$ would be negative because x is greater than a.
   - Therefore, y would be negative, which does not satisfy $0 < y < 1$.
   - This option does not work.
2. **Option b:** $y = (x - a) / (b - a)$
   - For $a < x < b$, the term $(x - a)$ is positive and less than $(b - a)$.
   - Dividing by $(b - a)$, which is positive, gives $0 < y < 1$.
   - This option satisfies the condition $0 < y < 1$.

3. **Option c:** $y = (x - b) / (b - a)$
   - For $a < x < b$, the term $(x - b)$ would be negative because x is less than b.
   - Therefore, y would be negative, which does not satisfy $0 < y < 1$.
   - This option does not work.
4. **Option d:** $y = (b - x) / (a + b)$
   - For $a < x < b$, the term $(b - x)$ is positive, but we need to check if this keeps y within $0 < y < 1$.
   - However, the denominator $(a + b)$ does not necessarily ensure that y falls between 0 and 1, as it is not directly related to the range $(b - a)$.
   - This option does not consistently satisfy $0 < y < 1$.

Conclusion

The only option that ensures $0 < y < 1$ for $a < x < b$ is:

Answer: Option b, $y = (x - a) / (b - a)$

S13. Ans.(c)

Sol. Given:

The string of letters is:

R A M U K Y A J N A S

The total number of letters in the string is **11**.

We are asked to find the probability that a randomly drawn letter is **NOT a vowel**.

Step 1: Identify the vowels in the string.

The vowels in the English alphabet are **A, E, I, O, U**.

From the given string, the vowels are:

- **A, A, A** (3 occurrences of 'A')
- **U** (1 occurrence of 'U')

Thus, there are **4 vowels** in the string.

Step 2: Identify the total number of letters.

The total number of letters in the string is **11**:

- **R, A, M, U, K, Y, A, J, N, A, S** (This is a total of 11 letters).

Step 3: Find the number of letters that are NOT vowels.

The number of letters that are **NOT vowels** is:

- Total letters = 11
- Vowels = 4
- Non-vowels = 11 - 4 = 7 (These are the consonants).

Step 4: Calculate the probability.

The probability of drawing a letter that is **NOT a vowel** is:

P(Not a vowel) = (Number of non-vowel letters) / (Total number of letters) = 7 / 11

P(Not a vowel)=Number of non-vowel lettersTotal number of letters=711P(\text{Not a vowel}) = \frac{\text{Number of non-vowel letters}}{\text{Total number of letters}} = \frac{7}{11}

Final Answer:

The probability that the letter drawn is **NOT a vowel** is **7/11**.

Correct Option:(c) 7/11.

S14. Ans.(c)
Sol. Given: Four children have a total of 27 apples. Each child has at least 5 apples, and no two children have the same number of apples.
Solution: We need four distinct numbers, each at least 5, that add up to 27.
Let's try the smallest set of distinct numbers that meet these criteria:
Suppose the children have 5, 6, 7, and 9 apples.
Calculating the sum: $5 + 6 + 7 + 9 = 27$
This combination works and meets the conditions: all numbers are distinct, each child has at least 5 apples, and the sum is 27.
Step 2: Analyzing the Options
The question asks which number could NOT be the number of apples a child had. Since we found a valid combination with children having 5, 6, 7, and 9 apples, it's clear that:
8 apples cannot be the number of apples any child has, as it would disrupt the distinctness or fail to sum to 27.
Conclusion: The number of apples a child could NOT have is 8.
Answer: 8

S15. Ans.(d)
Sol. Given:
There are four entries in column A that must be matched with entries in column B. Each correctly matched option scores one mark, while no marks are awarded for incorrect matches. We need to determine which of the following marks cannot be scored.
Solution:
Since there are four entries in column A and four entries in column B, we have the following possible outcomes:
If all four matches are correct, the score is 4.
If three matches are correct, the score is 3.
If two matches are correct, the score is 2.
If one match is correct, the score is 1.
If none are correct, the score is 0.
Each of these scores (0, 1, 2, 3, and 4) represents all possible scores that can be achieved based on correct or incorrect matches.
However, the question specifically asks which mark cannot be scored. Since we have covered all possible scores from 0 to 4, it appears all these scores can be achieved under different matching scenarios.
Thus, the answer is (d) 4 because all marks from 0 to 4 are possible scores, meaning there is no mark that cannot be scored.

S16. Ans.(d)
Sol. Given:
The plane lands ahead of schedule, and the post is transported by a rickshaw.
The rickshaw meets the truck 30 minutes after the plane's arrival.
The truck, after meeting the rickshaw, returns to the post office 20 minutes early compared to its usual schedule.

Solution:
Let:
"T" represent the scheduled round-trip time for the truck to go to the plane and return to the post office.
Since the truck saved 20 minutes by meeting the rickshaw halfway, the total time taken by the truck in this new scenario is "T - 20" minutes.
Step 1: Analyze the Time Saved
If the truck saved a total of 20 minutes, it means it saved 10 minutes on each leg of the journey (going and returning). Therefore, the truck avoided traveling 10 minutes' worth of distance each way because it met the rickshaw partway.
Step 2: Calculate the Early Arrival of the Plane
Since the rickshaw met the truck 30 minutes after the plane landed, this 30 minutes includes the time saved by the truck. Therefore, the early arrival time of the plane is the time it took for the truck to save each leg of travel (10 minutes) plus the 30 minutes after the plane's landing when the rickshaw met the truck.
So, the plane arrived: 30 minutes + 10 minutes = 40 minutes early.
Answer: The plane arrived **40 minutes** early.

S17. Ans.(c)
Sol. Given:
- In 1979, Ramesh's age was equal to the sum of the digits of his year of birth.
- We need to determine his age in 2017.

Concept:
1. Let Ramesh's year of birth be x.
2. His age in 1979 is calculated as 1979 - x, which is equal to the sum of the digits of x.
3. Using this, we can solve for x and then calculate his age in 2017.

Solution:
Assume the year of birth is $x = 1900 + 10a + b$, where a and b are the last two digits of the year.
The sum of the digits of x is $1 + 9 + a + b$, which equals $10 + a + b$.
Given $1979 - x = 10 + a + b$, substitute $x = 1900 + 10a + b$ into the equation:$1979 - (1900 + 10a + b) = 10 + a + b$.
Simplify:$79 - 10a - b = 10 + a + b$.
Combine terms:$69 = 11a + 2b$.
Solve for a and b:
Let $a = 5$. Substitute into $11a + 2b = 69$:
$11(5) + 2b = 69, 55 + 2b = 69, 2b = 14$, so $b = 7$.
The year of birth is $1900 + 10(5) + 7 = 1957$.
Calculate Ramesh's age in 2017: $2017 - 1957 = 60$
Final Answer:
Ramesh's age in 2017 was 60 years.

S18. Ans.(c)
Sol. Given:
We need to find which of the following numbers **cannot** divide the product of two integers whose sum is 14:
Step 1: List the pairs of integers whose sum is 14:

The possible pairs of positive integers xxx and yyy where x+y=14x + y = 14x+y=14 are:

- (1, 13)
- (2, 12)
- (3, 11)
- (4, 10)
- (5, 9)
- (6, 8)
- (7, 7)

Step 2: Calculate the product for each pair:

1. $1 \times 13 = 13$
2. $2 \times 12 = 24$
3. $3 \times 11 = 33$
4. $4 \times 10 = 40$
5. $5 \times 9 = 45$
6. $6 \times 8 = 48$
7. $7 \times 7 = 49$

Step 3: Check divisibility by each number (12, 13, 14, 49):

(a) Divisibility by 12:

- **24** is divisible by 12.
- **48** is divisible by 12.
- The other products (13, 33, 40, 45, and 49) are not divisible by 12. But, since **24** and 48are divisible by 12, it's possible for the product to be divisible by 12.

(b) Divisibility by 13:

- **13** is divisible by 13.
- The other products (24, 33, 40, 45, 48, and 49) are not divisible by 13. But, since 13 is divisible by 13, it is possible for the product to be divisible by 13.

(c) Divisibility by 14:

- **24** is not divisible by 14.
- **33** is not divisible by 14.
- **40** is not divisible by 14.
- **45** is not divisible by 14.
- **48** is not divisible by 14.
- **49** is not divisible by 14.

Thus, **none** of the products are divisible by 14. Therefore, the product **cannot** be divisible by 14.

(d) Divisibility by 49:

- **49** is divisible by 49.
- The other products (13, 24, 33, 40, 45, and 48) are not divisible by 49. But, since49 is divisible by 49, it is possible for the product to be divisible by 49.

Conclusion:

The correct answer is that the product **cannot** be divisible by **14**.

Final Answer:

The correct answer is **(c) 14**.

S19. Ans.(d)
Sol. Given:
- There are 5 dishes available.
- We need to create a menu containing either 3 or 4 dishes.
We are to find the number of ways to make a menu containing either 3 or 4 dishes.
Solution:
Step 1: Number of ways to choose 3 dishes out of 5
To choose 3 dishes from 5, we use the combination formula:
Combination Formula:(nr)=n!r!(n−r)!(rn)=r!(n−r)!n!
For 3 dishes out of 5:
(53)=5!3!(5−3)!=5×42×1=10(35)=3!(5−3)!5!=2×15×4=10
So, there are 10 ways to choose 3 dishes.
Step 2: Number of ways to choose 4 dishes out of 5
To choose 4 dishes from 5:
(54)=5!4!(5−4)!=51=5(45)=4!(5−4)!5!=15=5
So, there are 5 ways to choose 4 dishes.
Step 3: Total number of ways
The total number of ways to form the menu is the sum of the two possibilities:
Totalways = (53)+(54)=10+5=15Total ways=(35)+(45)=10+5=15
Thus, the total number of ways to create a menu with either 3 or 4 dishes is 15.
Final Answer:
The correct option is (d) 15.

S20. Ans.(a)
Sol. Given:
1. Speed of the bird = 20 km/h
2. The bird keeps flying continuously between the two trains for 1 hour.
The distance covered by the bird is independent of the relative speeds of the trains. Since the bird flies continuously for 1 hour at a constant speed of 20 km/h, the total distance covered by the bird in this time is:
Formula Used:
Distance=Speed×TimeDistance=Speed×Time
Calculation:
Distance=20km/h×1hour=20kmDistance=20km/h×1hour=20km
Final Answer:
(a) 20 km