CSIR NET General Aptitude Questions Answers With Solutions

Q1. A and B have in their collection, coins of Re. 1. Rs. 2, Rs. 5 and Rs. 10 in the ratio 3:2:2:1 and 4:3:2:1, respectively. The total number of coins with each of them is equal. If the value of coins with A is Rs. 270/-, what is the value of the coins (in Rs) with B?

(a) 213
(b) 240
(c) 275
(d) 282

Q2. If the speed of a train is increased by 20%, its travel time between two stations reduces by 2 hrs. If its speed is decreased by 20%, the travel time increases by 3 hrs. What is the normal duration of travel (in hrs)?

(a) 11.5
(b) 12.0
(c) 13.2
(d) 14.0

Q3. Person A tells the truth 30% of the times and B tells the truth 40% of the times, independently. What is the minimum probability that they would contradict each other?

(a) 0.18
(b) 0.42
(c) 0.46
(d) 0.50

Q4. The standard deviation of data $x_1, x_2, x_3, \ldots\ldots x_n$ **is** σ $(\sigma > 0)$. **Then the standard deviation of data** $3x_1 + 2, 3x_2 + 2, 3x_3 + 2, \ldots\ldots 3x_n + 2$ **is**

(a) 3 σ
(b) σ
(c) 3σ + 2
(d) 9 σ

Q5. A device needs 4 batteries to run. Each battery runs for 2 days. If there are a total of 6 batteries available, what is the maximum number of days for which the device can be run by strategically replacing the batteries till all the batteries are completely drained of power?

(a) 2
(b) 3
(c) 4
(d) 5

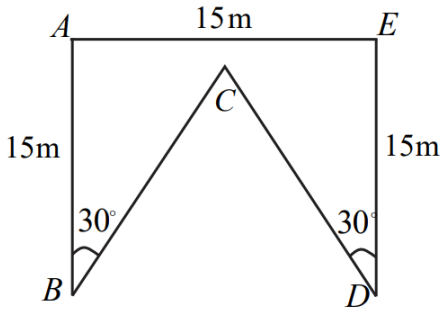
Q6. The difference of the squares of two distinct two-digit numbers with one being obtained by reversing the digits of the other is always divisible by

(a) 4
(b) 6
(c) 10
(d) 11

Q7. A person takes loan of Rs. 1,50,000 at a compound interest rate of 10% per annum. If the loan is repaid at the end of the 3rd year, what is the total interest paid?

(a) 145000
(b) 82600
(c) 94600
(d) 49650

Q8. The figure shows map of a field bounded by ABCDE. If AB and DE are perpendicular to AE, then the perimeter of the field is



(a) 70 m
(b) 75 m
(c) 80 m
(d) 85 m

Q9. The ratio of ages of a mother and daughter is 14:1 at present. After four years, the ratio of their ages will be 16:3. What was the age of mother when the daughter was born?

(a) 26
(b) 28
(c) 30
(d) 32

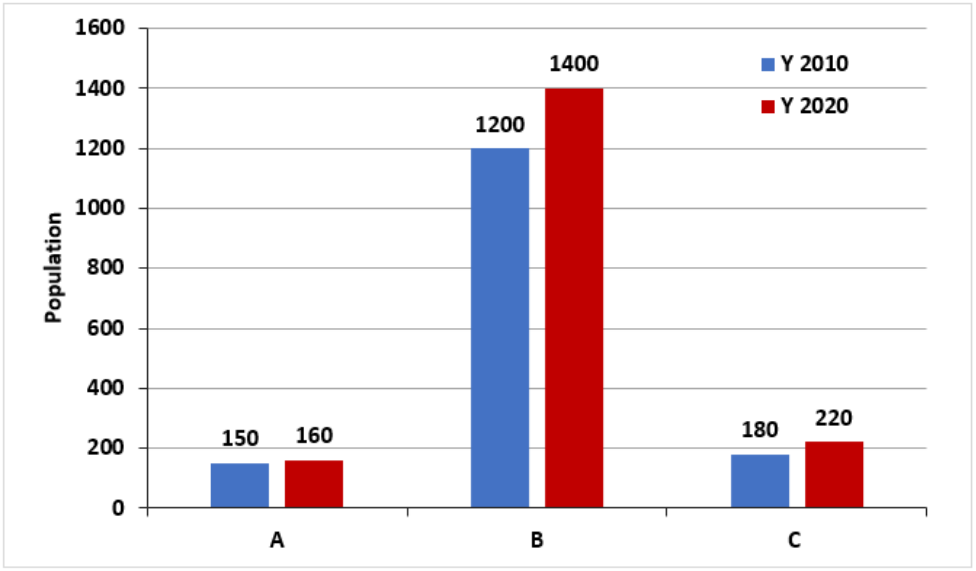
Q10. Five identical incompressible spheres of radius 1 unit are stacked in a pyramidal form as shown in the figure. The height of the structure is

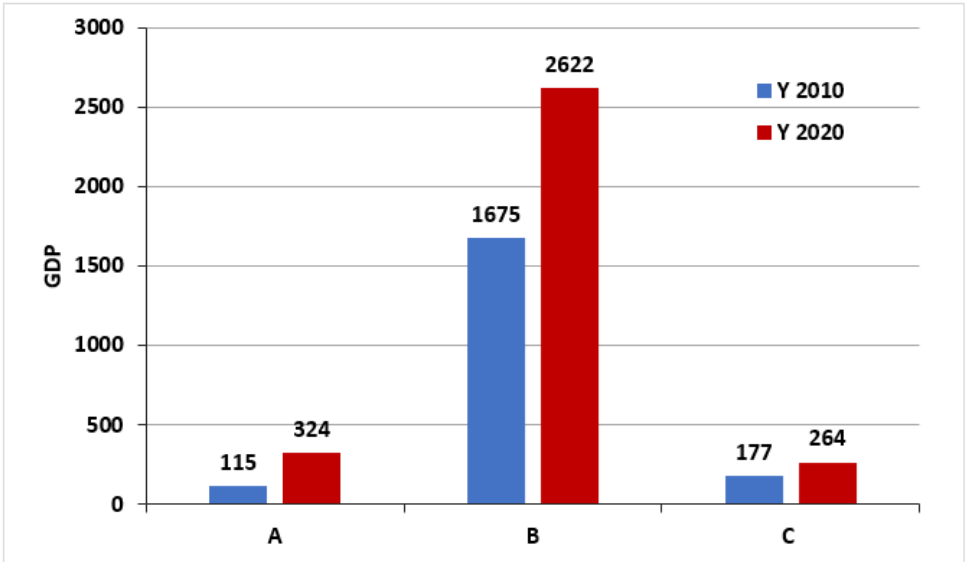
Top view

(a) $2+\sqrt{2}$
(b) $2+\sqrt{3}$
(c) $2+2\sqrt{2/3}$
(d) 3

Q11. In a meeting of 45 people, there are 40 people who know one another and the remaining know no one. People who know each other only hug, whereas those who do not know each other only shake hands. How many handshakes occur in this meeting?
(a) 225
(b) 10
(c) 210
(d) 200

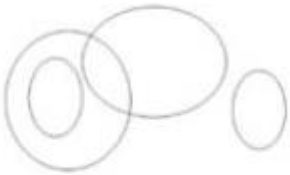
Q12. The populations and gross domestic products (GDP) in billion USD of three countries A, B and C in the years 2010 and 2020 are shown in the two figures below.





In terms of increase in per capita GDP from 2010-2020, their ranking from high to low is
(a) A, B, C
(b) B. A, C
(c) B, C, A
(d) C, A, B,

Q13. An appropriate diagram to depict the relationships between the categories INSECTS, BIRDS, EXTINCT ANIMALS and PEACOCKS is

A. 

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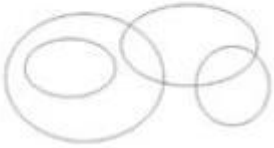
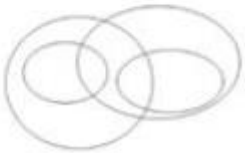
C. 

D. 

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

Q14. Two datasets A and B have the same mean. Which of the following MUST be true?
(a) Sum of the observations in A = Sum of the observations in B.
(b) Mean of the squares of the observations in A = Mean of the squares of the observations in B.
(c) If the two datasets are combined, then the mean of the combined dataset = mean of A + mean of B.
(d) If the two datasets are combined, then the mean of the combined dataset = mean of A.

Q15. In an assembly election, parties A, B, C, D and E won 30, 25, 20, 10 and 4 seats, respectively; whereas independents won 9 seats. Based on this data, which of the following statements must be INCORRECT?
(a) No party has majority.
(b) A and C together can form the government.
(c) A and D with the support of independents get the majority.
(d) An MLA from E can become Chief Minister.

Q16. A boy can escape through a window of size at least 4 feet. The 28 windows of a house are of sizes 2, 3, 4 or 5 feet and their numbers are proportional to their sizes. The number of windows available for the boy to escape through is
(a) 2
(b) 9
(c) 10
(d) 18

Q17. In an examination containing 10 questions, each correct answer is awarded 2 marks, each incorrect answer is awarded-1 and each unattempted question is awarded zero. Which of the following CANNOT be a possible score in the examination?

(a) -9
(b) -7
(c) 17
(d) 19

Q18. Consider the following paragraph: THE ABILITY TO REASON ACCURATELY IS VERY IMPORTANT, AS IS THE ABILITY TO COUNT. AS AN EXERCISE IN BOTH, LET US COUNT HOW MANY TIMES THE LETTER "E" OCCURS IN THIS PARAGRAPH. THE CORRECT COUNT IS _____.
Which option when put in the blank in the above paragraph will make the final sentence accurate?

(a) SIXTEEN
(b) SEVENTEEN
(c) EIGHTEEN
(d) NINETEEN

Q19. In a group of 7 people, 4 have exactly one sibling and 3 have exactly two siblings. Two people selected at random from the group, what is the probability that they are NOT siblings?

(a) 5/21
(b) 16/21
(c) 3/7
(d) 4/7

Q20. On a spherical globe of radius 10 units, the distance between A and B is 25 units. If it is uniformly expanded to a globe of radius 50 units, the distance between them in the same units would be

(a) 75
(b) 125
(c) 150
(d) 625

Solutions

S1. Ans.(b)
Sol. Given:
A's ratio: 3:2:2:1 for Re. 1, Rs. 2, Rs. 5, and Rs. 10 coins.
B's ratio: 4:3:2:1 for Re. 1, Rs. 2, Rs. 5, and Rs. 10 coins.
Value of A's coins = Rs. 270.
Formula:
Value of coins = (Re. 1 coins × 1) + (Rs. 2 coins × 2) + (Rs. 5 coins × 5) + (Rs. 10 coins × 10).

Solution:

Let the total number of coins with A be x. Using the ratio 3:2:2:1, the number of each type of coin is:

Re. 1 coins = (3/8) × x.

Rs. 2 coins = (2/8) × x.

Rs. 5 coins = (2/8) × x.

Rs. 10 coins = (1/8) × x.

Total value of coins:

(3/8)x × 1 + (2/8)x × 2 + (2/8)x × 5 + (1/8)x × 10 = 270.

Simplify:

(3x + 4x + 10x + 10x) / 8 = 270.

27x / 8 = 270.

x = 80.

Now, for B, using the ratio 4:3:2:1, the number of each type of coin is:

Re. 1 coins = (4/10) × 80 = 32.

Rs. 2 coins = (3/10) × 80 = 24.

Rs. 5 coins = (2/10) × 80 = 16.

Rs. 10 coins = (1/10) × 80 = 8.

Total value of coins:

32 × 1 + 24 × 2 + 16 × 5 + 8 × 10.

= 32 + 48 + 80 + 80 = 240.

Final Answer:

(b) 240

S2. Ans.(b)

Sol. Given:

Speed increases by 20%, and time reduces by 2 hours.

Speed decreases by 20%, and time increases by 3 hours.

Formula: Time = Distance / Speed.

Solution: Let the normal speed of the train be x and the normal time be t.

The distance between the stations is D = x × t.

With a 20% increase in speed: t - 2 = D / 1.2x

Substituting D = x × t: t - 2 = t / 1.2

Simplify: 1.2(t - 2) = t 1.2t - 2.4 = t 0.2t = 2.4 t = 12

Verifying with a 20% decrease in speed: t + 3 = D / 0.8x

Substituting D = x × t: t + 3 = t / 0.8

Simplify: 0.8(t + 3) = t

0.8t + 2.4 = t

0.2t = 2.4

t = 12

Final Answer: (b) 12.0

S3. Ans.(c)
Sol. Given:
Probability of A telling the truth = 0.3.
Probability of B telling the truth = 0.4.
Formula: The probability of contradiction = P(A truth and B lie) + P(A lie and B truth).
Solution:
1. Probability that A tells the truth and B lies:
P(A truth and B lie) = 0.3 × (1 - 0.4) = 0.3 × 0.6 = 0.18
2. Probability that A lies and B tells the truth:
P(A lie and B truth) = (1 - 0.3) × 0.4 = 0.7 × 0.4 = 0.28
3. Total probability of contradiction:
P(contradiction) = 0.18 + 0.28 = 0.46
Final Answer: (c) 0.46

S4. Ans.(a)
Sol. Given:
Original standard deviation = σ.
Formula: If data is scaled by a factor k, the new standard deviation is k × σ.
Solution: The data is scaled by 3 and shifted by 2.
Shifting does not affect the standard deviation, so
the new standard deviation is: 3 × σ = 3σ
Final Answer: (a) 3σ

S5. Ans.(b)
Sol. Given:
- Each battery lasts 2 days.
- The device needs 4 batteries to run.
- Total batteries = 6.

Formula:
Maximum runtime = Total battery-days ÷ 4 (number of batteries used at once).
Solution:
1. Each battery lasts for 2 days, so total battery-days:
6 × 2 = 12 battery-days
2. Divide the total battery-days by the number of batteries required at once:
Maximum runtime = 12 ÷ 4 = 3 days
Final Answer: (b) 3

S6. Ans.(d)
Sol. Given:
- Two numbers: 10a + b and 10b + a, where a and b are the digits.

Formula:
Difference of squares = $(10a + b)^2 - (10b + a)^2$.

Solution:

1. 22

Expand: (10a + b) - (10b + a) = [(10a + b) + (10b + a)] × [(10a + b) - (10b + a)] = (11a + 11b) × (9a - 9b)

2. Factor out common terms: = 11 × 9 × (a + b) × (a - b)

3. Clearly, the result is always divisible by 11.

Final Answer: (d) 11

S7. Ans.(d)

Sol. Given:

- Principal = Rs. 1,50,000.
- Rate = 10% per annum.
- Time = 3 years.

Formula:

Compound Interest = Principal × $[(1 + r)^t - 1]$, where r = rate and t = time.

Solution:

1. Calculate the total amount to be paid:

$A = 1,50,000 \times (1 + 0.1)^3$

$A = 1,50,000 \times (1.1)^3$

A = 1,50,000 × 1.331 = Rs. 1,99,650

2. Total interest = Amount - Principal:

Interest = 1,99,650 - 1,50,000 = Rs. 49,650

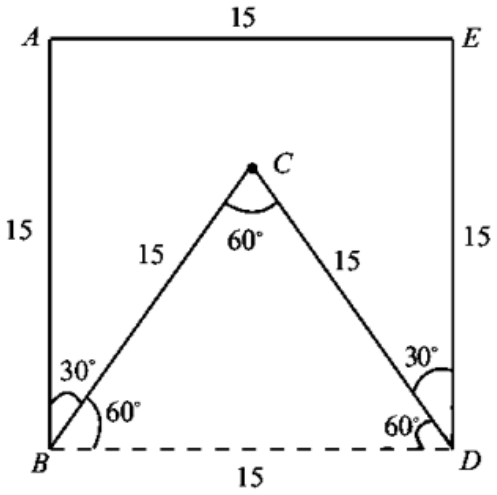
Final Answer: (d) 49,650

S8. Ans.(b)

Sol. Given:

BCD is an equilateral triangle, so BC = CD = DB = 15 m.

AB = DE = AE = 15 m.



Formula: The perimeter of the field = AE + ED + DC + CB + BA.

Solution: Substitute The given values: Perimeter = 15 + 15 + 15 + 15 + 15 = 75 m.

Final Answer: (b) 75 m

S9. Ans.(a)

Sol. Given:

- Present age ratio of mother and daughter = 14:1.
- After 4 years, the ratio of their ages = 16:3.

Formula:

Present age of mother = 14x, present age of daughter = x.

Solution:

1. After 4 years:

Mother's age = 14x + 4, Daughter's age = x + 4.

Given, the ratio after 4 years:

(14x + 4) / (x + 4) = 16 / 3.

2. Cross-multiply and simplify:

3(14x + 4) = 16(x + 4)

42x + 12 = 16x + 64

42x - 16x = 64 - 12

26x = 52

x = 2.

3. Present ages:

Mother's age = 14x = 14 × 2 = 28.

Daughter's age = x = 2.

4. Age of mother when daughter was born:

Mother's age = 28 - 2 = 26.

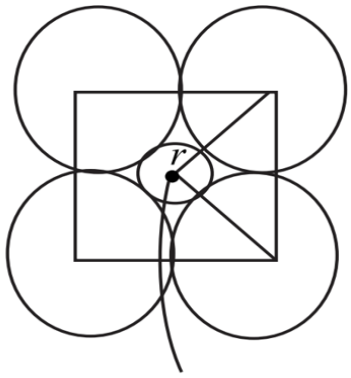
Final Answer: (a) 26

S10. Ans.(a)

Sol. Given:

Radius of each sphere = 1 unit.

Five spheres are stacked in a pyramidal structure.



Formula: The total height of the structure = Diameter of the bottom sphere + Radius of the cavity between the lower and upper spheres + Radius of the top sphere.

Solution:

1. The diameter of the bottom sphere is 2 units.

2. The radius of the cavity between the lower and upper spheres is calculated as:

$(1 + r)^2 + (1 + r)^2 = (1 + 1)^2$

Simplifying: $2(1 + r)^2 = 4$ $(1 + r)^2 = 2$
$1 + r = \sqrt{2}$
$r = \sqrt{2} - 1$.
3. Adding all contributions to the height:
Height = 2 (diameter of the bottom sphere) + 1 (radius of the lower sphere) + $(\sqrt{2} - 1)$ (radius of the cavity)
Height = $2 + \sqrt{2}$.
Final Answer: (a) $2 + \sqrt{2}$

S11. Ans.(a)

S12. Ans.(a)

S13. Ans.(a)

S14. Ans.(a)

S15. Ans.(a)

S16. Ans.(d)
Sol. Given :-
The house has 28 windows, and their sizes are 2, 3, 4, or 5 feet.
The number of windows is proportional to their sizes.
The boy can escape through windows of size at least 4 feet.
Solution:-
Let the number of windows of size 2, 3, 4, and 5 feet be in the ratio 2:3:4:5.
Let the constant of proportionality be
Number of 2-foot windows =2x
Number of 3-foot windows =3x
Number of 4-foot windows =4x
Number of 5-foot windows =5x
The total number of windows is 28
2x+3x+4x+5x=28
14x=28
x=2
By putting value
Number of 2-foot windows =2x=4
Number of 3-foot windows =3x=6
Number of 4-foot windows =4x=8
Number of 5-foot windows =5x=10
The boy can escape through the 4-foot and 5-foot windows, so the total number of windows available for escape is:
8+10=**18**
Thus, the correct answer is option (D) 18

S17. Ans.(a)

S18. Ans.(d)
Sol. Here are the counts of E
THE -1 ABILITY-0 TO-0
REASON-1 ACCURATELY-1 IS-0
VERY-1 IMPORTANT-0 AS-0
IS-0 THE-1 ABILITY-0
TO-0 COUNT-0 AS-0
AN-0 EXERCISE-3 IN-0
BOTH-0 LET-1 US-0
COUNT-0 HOW-0 MANY-0
TIMES-1 THE-1 LETTER-2
"E" -1 OCCURS-0 IN-0
THIS-0 PARAGRAPH-0 THE-1
CORRECT-1
So here number of "E" is 16
(a) SIXTEEN
here number "E" is 2 so total 16 + 2 = 18
So (1) is not correct
(b) SEVENTEEN
here number "E" is 4 so total 16 + 4 = 20
So (2) is not correct
(c) EIGHTEEN
here number "E" is 3 so total 16 + 3 = 19
So (3) is not correct
(d) NINETEEN
here number "E" is 3 so total 16 + 3 = 19 = NINETEEN
So (d) is correct

S19. Ans.(a)

S20. Ans.(a)