

## CDC 01 2022 QA

**Q 1.** The number of girls in a class was 15 more than the number of boys. The number of toffees distributed among boys and girls in the class were 135 and 126 respectively. If the average number of toffees distributed among the girls was 2 less than the average number of toffees distributed among the boys, then what was the number of boys in the class?

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**Q 2.** Surekha went to the vegetable market with enough money to purchase either 6 kg tomatoes or 5 kg potatoes. At the market she decided to spend only 80% of the money and purchased 3 kg potatoes and some tomatoes. What is the weight of tomatoes purchased by Surekha?

- 1) 2 kg
- 2) 1.8 kg
- 3) 0.8 kg
- 4) 1.2 kg

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**Q 3.** Points A, B, C and D lie on the same straight line such that B, C and D are 200 m, 300 m and 500 m away from A respectively. Anshu and Ravi leave A at the same time and run towards D. Simultaneously; Sindhu leaves D and runs towards A. Sindhu meet Anshu at C, and Ravi at B. If each person is running in uniform speed, then the speed of the fastest person is what percent more than that of the slowest person?

- 1) 50%
- 2) 100%
- 3) 125%
- 4) 150%

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**Q 4.** Let  $a_1, a_2, a_3, \dots$  be a decreasing AP such that  $a_2 + a_3 + \dots + a_n = -36$  and  $a_1 + a_2 + \dots + a_{n-1} = 0$ . If  $a_9 - a_5 = -16$ , then what is the value of  $a_1$ ?

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**Q 5.** Let A be a triangle formed by a straight line  $5x + 12y - 60 = 0$  and the co-ordinate axes. Then, find the area (in sq. units) of the circumcircle of triangle A.

- 1)  $169\pi/4$
- 2)  $49\pi$
- 3)  $36\pi$

4)  $225\pi/4$

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**Q 6.** P, Q, and R are 3 salesmen. In 1st month, they receive a commission of Rs.  $x$  and divide it in the ratio of 2 : 3 : 4. In 2nd month, they receive a commission of Rs.  $2x$  and divide it in the ratio of 3 : 5 : 2. In the 3rd month, they receive a commission of Rs.  $3x/4$  and divide it in the ratio of 4 : 3 : 5. If the average commission earned by Q over 3 months is Rs. 4,380, then how much share (in Rs.) did R get in 3rd month?

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**Q 7.** If a milkman adds 8 liters of water to a mixture of milk and water, then the ratio of milk to water in the new mixture becomes 2 : 3. Again, if he adds 7 liters of pure milk to the new mixture then the ratio of milk to water becomes 5 : 4. What was the ratio of milk to water in the original mixture?

- 1) 8 : 5
  - 2) 2 : 1
  - 3) 4 : 1
  - 4) 5 : 2
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**Q 8.** If  $x$  satisfies the equation  $|x^2 - 5x + 3| + |x - 3| = x - 4$ , then the number of integer values of ' $x$ ' is/ are

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**Q 9.** A and B play a game. An integer between 0 and 50 is selected and given to A. Whenever A receives a number, he doubles it and passes the result to B. Whenever B receives a number, he adds 25 to it and passes the result to A. The winner is the last person who gets a number less than 500. Let  $N$  be the initial number that results in a win for A. How many values of  $N$  are possible?

- 1) 1
  - 2) 2
  - 3) 3
  - 4) More than 3
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**Q 10.** Two trains X and Y have lengths of 350 m and 250 m. When they run in the same direction, the faster train takes 150 seconds to cross the slower train. When they run in opposite directions, they take 25 seconds to cross each other. Find the ratio of the speeds of the trains X and Y respectively.

- 1) 7 : 5
- 2) 6 : 7
- 3) 8 : 7

4) 3 : 1

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**Q 11.** A circle of diameter QR is drawn on a triangle PQR, which intersects PQ and PR at points S and T respectively. If PQ = 24 cm and PR = 18 cm, then the ratio of QT : RS is

1) 3 : 4

2) 2 : 3

3) 3 : 2

4) 4 : 3

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**Q 12.** A real valued function  $f(x)$  is such that  $f(x + y) = f(x) + f(y) + 6xy + 3$  for all real values of  $x$  and  $y$ . Find the value of  $f(3)$  if  $f(-1) = 6$ .

1) 0

2) -6

3) 6

4) -3

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**Q 13.** Three friends A, B and C work together to complete a piece of work. The time it takes for them to do the work together is 7 hours less than what A would have taken working alone, 10 hours less than what C would have taken working alone and one-fourth the time B would have taken working alone. How long (in hours) does it take for them to complete the work working together?

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**Q 14.**

If  $\frac{\log_{25} x + \log_{18} x}{(\log_{25} x)(\log_{18} x)} = 3$ , where  $x$  is a real number, then which of the following is correct?

1)  $x > 8$

2)  $4 < x < 5$

3)  $6 < x < 7$

4)  $7 < x < 8$

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**Q 15.** A group of students prepared 3000 soft toys as a group activity at a cost of Rs. 2,400. They gave away 500 soft toys to a charity free of cost. They allowed a discount of 20% on the marked price and gave one free soft toy for every soft toy bought at a time. They were able to sell all the soft toys. If marked price of a soft toy is Rs. 3.50, then what is their overall gain/loss percentage in the whole transaction?

1) 36.67%

2) 50.33%

3) 45.83%

4) 54%

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**Q 16.** Two circles have their centers at P and Q. The radius of the first circle is  $r$ , while that of the second is  $3r$  and  $PQ$  is more than  $4r$ . The tangents from P to the second circle intersect the first circle at A and B, respectively, while the tangents from Q to the first circle intersect the second circle at C and D, respectively. If  $AB = 7$  cm, find the length (in cm) of CD.

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**Q 17.** How many even numbers with different digits less than 100000 can be formed using the digits 1, 2, 3, 4, 5, 6, 7 and 8?

1) 4396

2) 4424

3) 4604

4) 4400

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**Q 18.** Two positive integers  $a$ , and  $b$  are 60% and 40% of a third integer,  $c$ , respectively. When two more positive integers  $d$  and  $e$  are added to the first three integers the sum is 41. Finally, when two more integers  $f$ , and  $g$  are added to the sum of the previous 5 integers the sum is 57. What is the maximum sum possible of all odd integers among the 7 integers?

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**Q 19.** A tank has a leak at its bottom which empties it at 8 liters/minute. It also has a filling tap which can fill the tank in 8 hours. If the tank takes 20 hours to become full, then find the capacity of the tank (in liters).

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**Q 20.** If the diagonals of a rhombus of side 20 cm are in the ratio 4 : 3, then what is the area (in sq.cm) of the rhombus?

1) 96

2) 384

3) 192

4) 768

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**Q 21.** For a natural number  $N$ ,  $3N$  has 28 factors and  $5N$  has 30 factors. How many factors does  $15N$  have?

- 1) 35
  - 2) 40
  - 3) 45
  - 4) 48
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**Q 22.** If  $a + b + c + d + e = 18$ , where  $a, b, c, d$  and  $e$  are positive numbers and  $x = (a + b)(c + d + e)$ , then which of the following is true?

- 1)  $0 \leq x \leq 9$
  - 2)  $9 \leq x \leq 36$
  - 3)  $0 < x \leq 81$
  - 4)  $9 < x \leq 36$
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