

CDC 05 2022 QA

Q 1. Two trains A and B were running in opposite directions with speeds in the ratio 6 : 5 respectively. Ram was running at a speed of 10.8 km/h parallel to the railway track in the same direction as that of train B. Train A and train B took equal time to cross Ram. Also, train A and train B crossed each other in 15 seconds. If the length of train B is 180 m, then the length, in meter, of train A is

- 1) 300
 - 2) 315
 - 3) 295
 - 4) 345
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Q 2. A triangle ABC of side 60 cm is an equilateral triangle. Points D and E are the midpoints of sides AB and AC respectively. If BE and CD intersect at O, then what is the area (in sq. cm) of triangle DEO?

- 1) $150\sqrt{3}$
 - 2) $50\sqrt{3}$
 - 3) $75\sqrt{3}$
 - 4) $25\sqrt{3}$
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Q 3.

If $f(x) = \sqrt{-x^2 + 16} + \frac{1}{x-3}$ is real, then x lies in which of these intervals?

- 1) $(-4, 3) \cup (3, 4)$
 - 2) $(-\infty, -4) \cup (3, \infty)$
 - 3) $[-4, 3) \cup (3, \infty)$
 - 4) $[-4, 3) \cup (3, 4]$
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Q 4. In 2001 the population of a town was a perfect square. Five years later, after an increase of 150 people, the population was 9 more than a perfect square. Now, in 2010, with an increase of another 150 people, the population is once again a perfect square. Which of the following is closest to the percent growth of the town's population during this 10-year period?

- 1) 62%
 - 2) 58%
 - 3) 54%
 - 4) 64%
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Q 5. A two-digit number when reversed becomes 75% greater than the original. By how much percentage is the units digit greater or lesser than the tens' place digit?

Q 6. How many even integers are there between 200 and 600 whose digits are all different and come from the set {1, 2, 4, 6, 7, 8}?

Q 7. If the equation $x^2 + mx + 96 = 0$ has two distinct integer roots, then how many distinct values are possible for $|m|$?

- 1) 6
- 2) 5
- 3) 12
- 4) 10

Q 8. Ten inlet pipes of same capacity fill a tank in same time in which 'a' outlet pipes of same capacity can empty it. Alternatively, 4 inlet and 2 outlet pipes is opened for first minute and 8 inlet and 4 outlet pipes open for 2nd minute and process continues till tank is completely filled in 30 minutes. If the time in which 2 outlet pipes can empty the completely filled tank is 72 minutes, then what is the value of 'a'?

Q 9. The total age of a joint family of 9 persons was 232 years in 2010. After 5 years, a 70-year old member expired and a baby was born in the same year. In 2020, a 52-year old member expired whereas a person got married and brought home a bride who was 22 years old. If a baby is born to the newlyweds in 2022, then what is the average age of the family in 2022?

- 1) 22 years
- 2) 25 years
- 3) 24 years
- 4) 28 years

Q 10. The area of a rhombus ABCD is 192 sq. cm. If $AC : BD = 2 : 3$, then find the side length, in cm, of the rhombus ABCD.

- 1) $12\sqrt{3}$
- 2) $4\sqrt{13}$
- 3) $6\sqrt{3}$
- 4) $8\sqrt{13}$

Q 11. How many integer values of x satisfy the equation $|2 + \log_{1/7} x| = 1 + |1 + \log_{1/7} x|$?

Q 12. The marked price of an article is Rs. 5,000. If two successive discounts of $x\%$ and $(x + 1)\%$, on the marked price is equal to a single discount of Rs. 1,430, then what will be the selling price (in Rs.) of the article if a single discount of $x\%$ is given on the marked price?

- 1) 4,500
- 2) 4,250
- 3) 3,750
- 4) 3980

Q 13. What is the number of ways of distributing 20 identical apples, 8 identical oranges and 4 identical kiwis in 4 baskets, so that each basket contains at least four apples and one orange?

- 1) 1225
- 2) 64
- 3) 42875
- 4) 343000

Q 14. Let $w > x > y > z$ and $w + x + y + z = 44$, where w, x, y , and z are integers. The pairwise positive differences of these numbers are 1, 3, 4, 5, 6 and 9. What is the sum of the possible values for w ?

Q 15. An alloy of aluminum, copper and zinc contains 75% aluminum, 8% copper and 17% zinc. A second alloy of aluminum and zinc melted with the first and the new alloy then contains 70% aluminum, 5% copper and 25% zinc. Find the percentage of aluminum in the second alloy.

- 1) 61.67%
- 2) 53.33%
- 3) 67.33%
- 4) 56.67%

Q 16. Let p be a common root of the quadratic equations $x^2 - 8x + c = 0$ and $x^2 - bx + 8 = 0$. If the other roots of the first and second equations are integers in the ratio 3 : 2, then the absolute difference between the other roots of the equations is

- 1) 1

- 2) 2
 - 3) 4
 - 4) 8
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Q 17. Citizens visiting a park can be categorised as, children, adults, and elderly who run an average of 8, 10, and 5 minutes per day, respectively. There are 50% more children than adults, and 50% more adults than elderly. The average number of minutes run per day by all of them lies in the interval ____.

- 1) (5, 6)
 - 2) (6.5, 8)
 - 3) (5, 7)
 - 4) (7.5, 9.5)
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Q 18. Let a_n be a sequence of integers such that $a_{p+q} = a_p + a_q + pq$ and $a_1 = 1$ for all positive integers p and q . Then a_{20} is divisible by how many prime numbers?

Q 19. A rectangular field 65 m long and 45 m wide is to be covered with grass, leaving 5 m on all four sides. If the cost of laying grass in the field is Rs. 16 per square meter, then the cost (in Rs.) of laying grass on the field is

Q 20. Dev and Anand invest Rs. 50,000 and Rs. 40,000 respectively in a business at the start of a year. In each of the next six months after the first month Dev keeps on adding Rs. 1,000 while Anand keeps on removing Rs. 1,000. In the remaining months Dev keeps on removing Rs. 1,000 per month while Anand keeps on adding Rs. 1,000 per month. Manoj joined them with Rs. 60,000 three months after the start and continued till the end of the year. What will be the difference in the shares of Dev and Manoj after a year if the total profit at the end of the year is Rs. 7,77,600?

- 1) Rs. 54,880
 - 2) Rs. 48,600
 - 3) Rs. 39,100
 - 4) Rs. 46,080
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Q 21. A completes $\frac{2}{3}$ of a certain job in 12 days. B can complete $\frac{1}{3}$ of the same job in 10 days and C can complete $\frac{3}{4}$ of the work in 15 days. All of them work together for 6 days and then B and C quit. How long (in days) will it take for A to complete the remaining work alone?

Q 22. If A, B, C are three distinct real numbers in Geometric Progression (GP) and $A + B + C = X \times B$, then what is the sum of all integral values of X in the interval $(-5, 5)$?

- 1) 5
 - 2) -5
 - 3) -9
 - 4) -3
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