

# CAT 2021 Slot 1 – Quantitative Ability



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# CAT 2021 Slot 2 – Quantitative Ability



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# Qn 1

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$f(x) = \frac{x^2+2x-15}{x^2-7x-18}$  is negative if and only if

- A)  $-5 < x < -2$  or  $3 < x < 9$
- B)  $-2 < x < 3$  or  $x > 9$
- C)  $x < -5$  or  $3 < x < 9$
- D)  $x < -5$  or  $-2 < x < 3$

Click to see the correct answer

Answer

Click to view video Solution  
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Video Solution

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Original CAT 2021 Question Paper

# Qn 2

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The number of integers  $n$  that satisfy the inequalities  $|n - 60| < |n - 100| < |n - 20|$  is

- A) 21
- B) 18
- C) 20
- D) 19

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Answer

Video Solution

# Qn 3

Identical chocolate pieces are sold in boxes of two sizes, small and large. The large box is sold for twice the price of the small box. If the selling price per gram of chocolate in the large box is 12% less than that in the small box, then the percentage by which the weight of chocolate in the large box exceeds that in the small box is nearest to

- A) 127
- B) 135
- C) 124
- D) 144

Answer

Video Solution

# Qn 4

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If  $5 - \log_{10}\sqrt{1+x} + 4\log_{10}\sqrt{1-x} = \log_{10}\frac{1}{\sqrt{1-x^2}}$ , then  $100x$  equals

(TITA)

Click to see the correct answer

Answer

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Original CAT 2021 Question Paper

# Qn 5

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A basket of 2 apples, 4 oranges and 6 mangoes costs the same as a basket of 1 apple, 4 oranges and 8 mangoes, or a basket of 8 oranges and 7 mangoes. Then the number of mangoes in a basket of mangoes that has the same cost as the other baskets is

- A) 12
- B) 13
- C) 11
- D) 10

Answer

Video Solution

# Qn 6

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If the area of a regular hexagon is equal to the area of an equilateral triangle of side 12 cm, then the length, in cm, of each side of the hexagon is

- A)  $4\sqrt{6}$
- B)  $6\sqrt{6}$
- C)  $2\sqrt{6}$
- D)  $\sqrt{6}$

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Answer

Video Solution



# Qn 7

Onion is sold for 5 consecutive months at the rate of Rs 10, 20, 25, 25, and 50 per kg, respectively. A family spends a fixed amount of money on onion for each of the first three months, and then spends half that amount on onion for each of the next two months. The average expense for onion, in rupees per kg, for the family over these 5 months is closest to

- A) 18
- B) 26
- C) 16
- D) 20

Answer

Video Solution

# Qn 8

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If  $r$  is a constant such that  $|x^2 - 4x - 13| = r$  has exactly three distinct real roots, then the value of  $r$  is

- A) 15
- B) 18
- C) 17
- D) 21

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Answer

Video Solution

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# Qn 9

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Amal purchases some pens at ₹ 8 each. To sell these, he hires an employee at a fixed wage. He sells 100 of these pens at ₹ 12 each. If the remaining pens are sold at ₹ 11 each, then he makes a net profit of ₹ 300, while he makes a net loss of ₹ 300 if the remaining pens are sold at ₹ 9 each. The wage of the employee, in INR, is (TITA)

Answer

Video Solution

# Qn 10

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Anil invests some money at a fixed rate of interest, compounded annually. If the interests accrued during the second and third year are ₹ 806.25 and ₹ 866.72, respectively, the interest accrued, in INR, during the fourth year is nearest to

- A) 931.72
- B) 926.84
- C) 929.48
- D) 934.65

Answer

Video Solution

# Qn 11

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The strength of an indigo solution in percentage is equal to the amount of indigo in grams per 100 cc of water. Two 800 cc bottles are filled with indigo solutions of strengths 33% and 17%, respectively. A part of the solution from the first bottle is thrown away and replaced by an equal volume of the solution from the second bottle. If the strength of the indigo solution in the first bottle has now changed to 21% then the volume, in cc, of the solution left in the second bottle is (TITA)

Answer

Video Solution

# Qn 12

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Amar, Akbar and Anthony are working on a project. Working together Amar and Akbar can complete the project in 1 year, Akbar and Anthony can complete in 16 months, Anthony and Amar can complete in 2 years. If the person who is neither the fastest nor the slowest works alone, the time in months he will take to complete the project is (TITA)

Answer

Video Solution

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Original CAT 2021 Question Paper

# Qn 13

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The number of groups of three or more distinct numbers that can be chosen from 1, 2, 3, 4, 5, 6, 7 and 8 so that the groups always include 3 and 5, while 7 and 8 are never included together is (TITA)

Answer

Video Solution



# Qn 14

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A circle of diameter 8 inches is inscribed in a triangle ABC where  $\angle ABC = 90^\circ$ .  
If BC = 10 inches then the area of the triangle in square inches is (TITA)

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Answer

Video Solution

# Qn 15

Suppose the length of each side of a regular hexagon ABCDEF is 2 cm. It T is the mid point of CD, then the length of AT, in cm, is

- A)  $\sqrt{15}$
- B)  $\sqrt{13}$
- C)  $\sqrt{12}$
- D)  $\sqrt{14}$

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Answer

Video Solution

# Qn 16

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Suppose hospital A admitted 21 less Covid infected patients than hospital B, and all eventually recovered. The sum of recovery days for patients in hospitals A and B were 200 and 152, respectively. If the average recovery days for patients admitted in hospital A was 3 more than the average in hospital B then the number admitted in hospital A was (TITA)

Answer

Video Solution

# Qn 17

The amount Neeta and Geeta together earn in a day equals what Sita alone earns in 6 days. The amount Sita and Neeta together earn in a day equals what Geeta alone earns in 2 days. The ratio of the daily earnings of the one who earns the most to that of the one who earns the least is

- A) 7 : 3
- B) 11 : 3
- C) 11 : 7
- D) 3 : 2

Answer

Video Solution

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# Qn 18

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The natural numbers are divided into groups as (1), (2, 3, 4), (5, 6, 7, 8, 9), .... and so on. Then, the sum of the numbers in the 15th group is equal to

- A) 6119
- B) 7471
- C) 4941
- D) 6090

Answer

Video Solution

# Qn 19

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Anu, Vinu and Manu can complete a work alone in 15 days, 12 days and 20 days, respectively. Vinu works everyday. Anu works only on alternate days starting from the first day while Manu works only on alternate days starting from the second day. Then, the number of days needed to complete the work is

- A) 8
- B) 6
- C) 5
- D) 7

Answer

Video Solution

# Qn 20

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How many three-digit numbers are greater than 100 and increase by 198 when the three digits are arranged in the reverse order? (TITA)

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Answer

Video Solution



# Qn 21

Two trains cross each other in 14 seconds when running in opposite directions along parallel tracks. The faster train is 160 m long and crosses a lamp post in 12 seconds. If the speed of the other train is 6 km/hr less than the faster one, its length, in m, is

- A) 184
- B) 180
- C) 190
- D) 192

Answer

Video Solution

# Qn 22

If  $x_0 = 1$ ,  $x_1 = 2$ , and  $x_{n+2} = \frac{1+x_{n+1}}{x_n}$ ,  $n = 0, 1, 2, 3, \dots$ , then  $x_{2021}$  is equal to?

- A) 4
- B) 3
- C) 1
- D) 2

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Answer

Video Solution

# Solution

Click to go "Back to Answer page"

- 1) A      11) 200      21) C  
2) D      12) 32      22) D  
3) A  
4) 99  
5) B  
6) C  
7) A  
8) C  
9) 1000  
10) A  
11) 200  
12) 32  
13) 47  
14) 120  
15) B  
16) 35  
17) B  
18) A  
19) D  
20) 70  
21) C  
22) D

# Sol 1

Click to see "overall Solution page"

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$f(x) = \frac{x^2+2x-15}{x^2-7x-18}$  is negative if and only if

A)  $-5 < x < -2$  or  $3 < x < 9$

B)  $-2 < x < 3$  or  $x > 9$

C)  $x < -5$  or  $3 < x < 9$

D)  $x < -5$  or  $-2 < x < 3$

Click to go "Back to Question"

Back to Question

Video Solution

Difficulty Level – Easy

Topic – **Functions**

# Sol 2

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The number of integers  $n$  that satisfy the inequalities  $|n - 60| < |n - 100| < |n - 20|$  is

- A) 21
- B) 18
- C) 20
- D) 19**

Difficulty Level – Easy

Topic – Inequalities

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Video Solution

# Sol 3

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Identical chocolate pieces are sold in boxes of two sizes, small and large. The large box is sold for twice the price of the small box. If the selling price per gram of chocolate in the large box is 12% less than that in the small box, then the percentage by which the weight of chocolate in the large box exceeds that in the small box is nearest to

- A) 127
- B) 135
- C) 124
- D) 144

Difficulty Level – Medium

Topic – Percentages

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# Sol 4

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If  $5 - \log_{10}\sqrt{1+x} + 4\log_{10}\sqrt{1-x} = \log_{10}\frac{1}{\sqrt{1-x^2}}$ , then  $100x$  equals  
(TITA)

Correct Answer: **99**

Difficulty Level – **Hard**

Topic – **Logarithms**



# Sol 5

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A basket of 2 apples, 4 oranges and 6 mangoes costs the same as a basket of 1 apple, 4 oranges and 8 mangoes, or a basket of 8 oranges and 7 mangoes. Then the number of mangoes in a basket of mangoes that has the same cost as the other baskets is

- A) 12
- B) 13**
- C) 11
- D) 10

Difficulty Level – Medium

Topic – Linear Equations

Back to Question

Video Solution

# Sol 6

If the area of a regular hexagon is equal to the area of an equilateral triangle of side 12 cm, then the length, in cm, of each side of the hexagon is

- A)  $4\sqrt{6}$
- B)  $6\sqrt{6}$
- C)  $2\sqrt{6}$**
- D)  $\sqrt{6}$

Difficulty Level – Medium

Topic – **Geometry**

# Sol 7

Onion is sold for 5 consecutive months at the rate of Rs 10, 20, 25, 25, and 50 per kg, respectively. A family spends a fixed amount of money on onion for each of the first three months, and then spends half that amount on onion for each of the next two months. The average expense for onion, in rupees per kg, for the family over these 5 months is closest to

- A) 18
- B) 26
- C) 16
- D) 20

Difficulty Level – Medium

Topic – Averages

# Sol 8

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If  $r$  is a constant such that  $|x^2 - 4x - 13| = r$  has exactly three distinct real roots, then the value of  $r$  is

- A) 15
- B) 18
- C) 17**
- D) 21

Difficulty Level –  Hard

Topic – Quadratic Equations

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Video Solution

# Sol 9

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Amal purchases some pens at ₹ 8 each. To sell these, he hires an employee at a fixed wage. He sells 100 of these pens at ₹ 12 each. If the remaining pens are sold at ₹ 11 each, then he makes a net profit of ₹ 300, while he makes a net loss of ₹ 300 if the remaining pens are sold at ₹ 9 each. The wage of the employee, in INR, is

(TITA)

Correct Answer: **1000**

Difficulty Level – Medium

Topic – Profit & Loss

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Video Solution

# Sol 10

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Anil invests some money at a fixed rate of interest, compounded annually. If the interests accrued during the second and third year are ₹ 806.25 and ₹ 866.72, respectively, the interest accrued, in INR, during the fourth year is nearest to

- A) 931.72
- B) 926.84
- C) 929.48
- D) 934.65

Difficulty Level – Medium

Topic – CI & SI

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Video Solution

# Sol 11

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The strength of an indigo solution in percentage is equal to the amount of indigo in grams per 100 cc of water. Two 800 cc bottles are filled with indigo solutions of strengths 33% and 17%, respectively. A part of the solution from the first bottle is thrown away and replaced by an equal volume of the solution from the second bottle. If the strength of the indigo solution in the first bottle has now changed to 21% then the volume, in cc, of the solution left in the second bottle is (TITA)

Correct Answer: **200**

Difficulty Level – Easy

Topic – **Mixtures**

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Video Solution

# Sol 12

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Amar, Akbar and Anthony are working on a project. Working together Amar and Akbar can complete the project in 1 year, Akbar and Anthony can complete in 16 months, Anthony and Amar can complete in 2 years. If the person who is neither the fastest nor the slowest works alone, the time in months he will take to complete the project is (TITA)

Correct Answer: **32**

Difficulty Level – Medium

Topic – Rates & Work

Back to Question

Video Solution



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# Sol 13

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The number of groups of three or more distinct numbers that can be chosen from 1, 2, 3, 4, 5, 6, 7 and 8 so that the groups always include 3 and 5, while 7 and 8 are never included together is (TITA)

Correct Answer: **47**

Difficulty Level – Medium

Topic – PnC

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Video Solution

# Sol 14

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A circle of diameter 8 inches is inscribed in a triangle ABC where  $\angle ABC = 90^\circ$ .  
If BC = 10 inches then the area of the triangle in square inches is (TITA)

Correct Answer: **120**

Difficulty Level – Easy

Topic – **Geometry**

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Video Solution

# Sol 15

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Suppose the length of each side of a regular hexagon ABCDEF is 2 cm. If T is the mid point of CD, then the length of AT, in cm, is

- A)  $\sqrt{15}$
- B)  $\sqrt{13}$**
- C)  $\sqrt{12}$
- D)  $\sqrt{14}$

Difficulty Level – **Hard**

Topic – **Geometry**

Back to Question

Video Solution

# Sol 16

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Suppose hospital A admitted 21 less Covid infected patients than hospital B, and all eventually recovered. The sum of recovery days for patients in hospitals A and B were 200 and 152, respectively. If the average recovery days for patients admitted in hospital A was 3 more than the average in hospital B then the number admitted in hospital A was (TITA)

Correct Answer: **35**

Difficulty Level – Medium

Topic – **Averages**

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Video Solution

# Sol 17

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The amount Neeta and Geeta together earn in a day equals what Sita alone earns in 6 days. The amount Sita and Neeta together earn in a day equals what Geeta alone earns in 2 days. The ratio of the daily earnings of the one who earns the most to that of the one who earns the least is

- A) 7 : 3
- B) 11 : 3**
- C) 11 : 7
- D) 3 : 2

Difficulty Level – Medium

Topic – Ratios & Proportions

Back to Question

Video Solution

# Sol 18

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The natural numbers are divided into groups as (1), (2, 3, 4), (5, 6, 7, 8, 9), .... and so on. Then, the sum of the numbers in the 15th group is equal to

- A) 6119
- B) 7471
- C) 4941
- D) 6090

Difficulty Level –  Hard

Topic – Sequences & Series

Back to Question

Video Solution

# Sol 19

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Anu, Vinu and Manu can complete a work alone in 15 days, 12 days and 20 days, respectively. Vinu works everyday. Anu works only on alternate days starting from the first day while Manu works only on alternate days starting from the second day. Then, the number of days needed to complete the work is

- A) 8
- B) 6
- C) 5
- D) 7**

Difficulty Level –  Medium

Topic – Rates & Work

Back to Question

Video Solution



# Sol 20

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How many three-digit numbers are greater than 100 and increase by 198 when the three digits are arranged in the reverse order? (TITA)

Correct Answer: **70**

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Difficulty Level – **Hard**

Topic – **Number Theory**

Back to Question

Video Solution

# Sol 21

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Two trains cross each other in 14 seconds when running in opposite directions along parallel tracks. The faster train is 160 m long and crosses a lamp post in 12 seconds. If the speed of the other train is 6 km/hr less than the faster one, its length, in m, is

- A) 184
- B) 180
- C) 190**
- D) 192

Difficulty Level – Medium

Topic – Speed & Time

Back to Question

Video Solution

# Sol 22

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If  $x_0 = 1$ ,  $x_1 = 2$ , and  $x_{n+2} = \frac{1+x_{n+1}}{x_n}$ ,  $n = 0, 1, 2, 3, \dots$ , then  $x_{2021}$  is equal to?

- A) 4
- B) 3
- C) 1
- D) 2**

Difficulty Level – **Medium**

Topic – **Sequences & Series**

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