

Quantitative Aptitude

Directions (1-5): In the following questions two number series I and II are given to you. You are expected to find the logic of the series and answer the question accordingly.

1.

Series I: 85, X, Y, 67.5, 137, 345

Series II: M, 10, 37, N, 178, 214

I: $M+N$ is a prime number

II: Number of factors of $M+Y$ is 6

III: Largest prime factor of $(2X+5N+6)$ is greater than 20

Which of the following statement(s) is/are true?

- A. I and II are correct
- B. II and III are correct
- C. I and III are correct
- D. III and IV are correct
- E. None of these

2.

Series I: 5, 348, 564, X, 753, Y

Series II: 35, 76, M, 488, N, 911, 1460

I: $2X-Y+k$ is a perfect square, $0 < k < 30$

II: M^2-1008 is a perfect square

III: $N+3$ has at least 3 prime factors

Which of the following statement(s) is/are true?

- A. Only I is correct
- B. Only II is correct
- C. Both I and III are correct
- D. Both II and III are correct
- E. None of these

3.

Series I: 4, 6, X, 49, Y, 1011

Series II: 2, M, N, 1220, 3674, 7350

I: LCM of X and M is more than 2500

II: Number of factors of N is more than 10

III: $X+Y+9$ is a perfect square

Which of the following statement(s) is/are true?

- A. Only I is correct
- B. I and II are correct
- C. II and III are correct
- D. Only II is correct
- E. None of these

4.

Series I: 4, 18, X, 336, 1005, Y

Series II: 9, 265, M, 457, 489, N

I: $X/5-1$, $(X-1)/7$ and $X/5+3$ form a Pythagorean triplet

II: Product of digits of M is a perfect square

III: Largest prime factor of $Y+M$ is at least more than 400.

Which of the following statement(s) is/are true?

- A. I and II are correct
- B. II and III are correct
- C. I and III are correct
- D. I, II and III are correct
- E. None of these

5.

Series I: 13, 29, X, Y, 411, 437

Series II: 3, 35, 165, M, 332, N

I: Ratio of X and $M+2$ is 3:4

II: Highest prime factor of N is at least greater than square of 7

III: A three-digit number $14p$ is added to Y such that another three-digit number $3p8$ is formed. Number of possible values of p is more than 1

Which of the following statement(s) is/are true?

- A. Only II are correct
- B. II and III are correct
- C. I and II are correct
- D. Only III is correct
- E. None of these

Directions (6-10): In the following questions two number series I and II are given to you. You are expected to find the logic of the series and answer the question accordingly.

6.

Series I: 4, 6, 12, 18, 30, 42, X, Y

Series II: 6, 14, 36, 98, 276, M, N

Which of the following statement(s) is/are true?

I: $(X+2Y-10)$ is a factor of N

II: $M+X+Y > 900$

III: M/p is a prime number. 'p' isn't a prime number.

- A. Only II is true
- B. Only II and III are true
- C. Only I is true
- D. All I, II and III are true
- E. None of these

7.

Series I: 15, 27, 57, 111, 225, X, Y

Series II: 10, -9, 22, -57, 244, M, N

Which of the following statement(s) is/are true?

I: 37 and 73 are factors of $N+Y$

II: $X+k=550$, $k > 100$

III: $(M+1220)$ is a perfect square

- A. only II is true
- B. only II and III are true
- C. only I is true
- D. all I, II and III are true
- E. None of these

8.

Series I: 21, X, 35, Y, 89, 131, 183

Series II: M, 18, 58, N, 4458, 44458, 444458

Which of the following statement(s) is/are true?

I: $X+Y > 80$

II: $M-N$ is a perfect square

III: $N+54$ is a perfect cube

- A. only II is true
- B. only II and III are true
- C. only III is true
- D. all I, II and III are true
- E. None of these

9.

Series I: 18, 22, X, 102, Y, 174, 686

Series II: 23, 24, 28, M, 68, 72, N

Which of the following statement(s) is/are true?

I: X, M and N form a Pythagorean triplet

II: $X+N$ is a prime number

III: $M+N$ has two prime factors

- A. only II is true
- B. only II and III are true
- C. only III is true

D. all I, II and III are true

E. None of these

10.

Series I: 12, 19, 27, X, 60, Y, 159

Series II: 2, 1, M, N, 236, 5895, 212214

Which of the following statement(s) is/are true?

I: Number of factors of X+Y is 8

II: M+N is a factor of X+Y

III: N^2+M is divisible by 3

A. only II is true

B. only II and III are true

C. only III is true

D. All I, II and III are true

E. None of these

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Answer Key with Explanation

1. Answer: A

For Series I,

1st term=85

2nd term= $85 \times 0.5 + 0.5 = 43 = X$

3rd term= $43 \times 1 + 1 = 44 = Y$

4th term= $44 \times 1.5 + 1.5 = 67.5$

5th term= $67.5 \times 2 + 2 = 137$

6th term= $137 \times 2.5 + 2.5 = 345$

For Series II,

1st term=6=M

2nd term= $6 + 2^2 = 10$

3rd term= $10 + 3^3 = 37$

4th term= $37 + 4^2 = 53 = N$

5th term= $53 + 5^3 = 178$

6th term= $178 + 6^2 = 214$

From Statement I, we have

$M+N=6+53=59$ which is a prime number

Thus, I is correct

From Statement II, we have

$M+Y=6+44=50$

Prime factorization of 50 gives $50=2^1 \times 5^2$

So, number of factors of $50=(1+1) \times (2+1)=6$

Thus, II is correct

From statement III, we have

$2X+5N+6=2 \times 43 + 53 \times 5 + 6 = 357$

Prime factorisation of 357 gives $357=3^1 \times 7^1 \times 17^1$

Largest prime factor is 17

Thus, III is not correct



2. Answer: A

For Series I,

$$1^{\text{st}} \text{ term} = 5$$

$$2^{\text{nd}} \text{ term} = 5 + 7^3 = 348$$

$$3^{\text{rd}} \text{ term} = 348 + 6^3 = 564$$

$$4^{\text{th}} \text{ term} = 564 + 5^3 = 689 = X$$

$$5^{\text{th}} \text{ term} = 689 + 4^3 = 753$$

$$6^{\text{th}} \text{ term} = 753 + 3^3 = 780 = Y$$

For Series II, we get

$$1^{\text{st}} \text{ term} = 5 * 2^2 + 15 = 35$$

$$2^{\text{nd}} \text{ term} = 10 * 3^2 - 14 = 76$$

$$3^{\text{rd}} \text{ term} = 15 * 4^2 + 13 = 253 = M$$

$$4^{\text{th}} \text{ term} = 20 * 5^2 - 12 = 488$$

$$5^{\text{th}} \text{ term} = 25 * 6^2 + 11 = 911 = N$$

$$6^{\text{th}} \text{ term} = 30 * 7^2 - 10 = 1460$$

For statement I, we have

$2X - Y + k$ is a perfect square and $k < 30$, $k > 0$

$$2X - Y + k = 598$$

Nearest square to 598 is 625

$$\Rightarrow k = 625 - 598 = 27 < 30$$

Thus, I is correct

For statement II, we have

$$M^2 - 1008 = 253^2 - 1008 = 64009 - 1008 = 63001$$

$$\sqrt{63001} = 251.57$$

So, 63001 isn't a perfect square

Thus, II is not correct

For statement III, we have

$$N + 3 = 911 + 3 = 914$$

Factors of 914 are 1, 2, 457 and 914. So there are only two prime factors

Thus, III is not correct.

3. Answer: C

For Series I,

$$1^{\text{st}} \text{ term} = 4$$

$$2^{\text{nd}} \text{ term} = 4 * 1 + 2 = 6$$

$$3^{\text{rd}} \text{ term} = 6 * 2 + 3 = 15 = X$$

$$4^{\text{th}} \text{ term} = 15 * 3 + 4 = 49$$

$$5^{\text{th}} \text{ term} = 49 * 4 + 5 = 201 = Y$$

$$6^{\text{th}} \text{ term} = 201 * 5 + 6 = 1011$$

For Series II,

$$1^{\text{st}} \text{ term} = 2$$

$$2^{\text{nd}} \text{ term} = 2 * 6 + 7 * 6 = 54 = M$$

$$3^{\text{rd}} \text{ term} = 54 * 5 + 6 * 5 = 300 = N$$

$$4^{\text{th}} \text{ term} = 300 * 4 + 5 * 4 = 1220$$

$$5^{\text{th}} \text{ term} = 1220 * 3 + 4 * 3 = 3672$$

$$6^{\text{th}} \text{ term} = 3672 * 2 + 3 * 2 = 7350$$

From Statement I, we have

$$\text{LCM of } X \text{ and } M = \text{LCM}(15, 54) = 270$$

Thus, I is not correct

From Statement II, we have

$$N = 300 = 2^2 * 3^1 * 5^2$$

Thus, no of factors of

$$N = (2+1)(1+1)(2+1) = 3 * 2 * 3 = 18$$

Thus, II is correct

From Statement III, we have

$$X + Y + 9 = 15 + 201 + 9 = 225 = 15^2$$

Thus, III is correct

4. Answer: A

For Series I, we have

$$1^{\text{st}} \text{ term} = 4$$

$$2^{\text{nd}} \text{ term} = 4 * 6 - 6 = 18$$

$$3^{\text{rd}} \text{ term} = 18 * 5 - 5 = 85 = X$$

$$4^{\text{th}} \text{ term} = 85 * 4 - 4 = 336$$



$$5^{\text{th}} \text{ term} = 336 \times 3 - 3 = 1005$$

$$6^{\text{th}} \text{ term} = 1005 \times 2 - 2 = 2008 = Y$$

For Series II, we have

$$1^{\text{st}} \text{ term} = 9$$

$$2^{\text{nd}} \text{ term} = 9 + 256 = 265$$

$$3^{\text{rd}} \text{ term} = 265 + 128 = 393 = M$$

$$4^{\text{th}} \text{ term} = 393 + 64 = 457$$

$$5^{\text{th}} \text{ term} = 457 + 32 = 489$$

$$6^{\text{th}} \text{ term} = 489 + 16 = 505 = N$$

From Statement I, we have

$$(X/5) - 1 = 17 - 1 = 16$$

$$(X-1)/7 = 84/7 = 12$$

$$(X/5) + 3 = 17 + 3 = 20$$

12, 16 and 20 form Pythagorean triplet

Thus, I is correct

From Statement II, we have

Product of digits of $M = 3 \times 9 \times 3 = 81$ which is a perfect square

Thus, II is correct

From Statement III, we have

$$Y + M = 2008 + 393 = 2401 = 7^4$$

So, largest prime factor of $Y + M$ is 7

Thus, III is not correct

5. Answer: C

For Series I, we get

$$1^{\text{st}} \text{ term} = 13$$

$$2^{\text{nd}} \text{ term} = 13 + (1+3)^2 = 29$$

$$3^{\text{rd}} \text{ term} = 29 + (2+9)^2 = 150 = X$$

$$4^{\text{th}} \text{ term} = 150 + (1+5+0)^2 = 186 = Y$$

$$5^{\text{th}} \text{ term} = 186 + (1+8+6)^2 = 411$$

$$6^{\text{th}} \text{ term} = 411 + (4+1+1)^2 = 447$$

For Series II, we get

$$1^{\text{st}} \text{ term} = 3$$

$$2^{\text{nd}} \text{ term} = 3 + 64/2 = 35$$

$$3^{\text{rd}} \text{ term} = 35 + 65 \times 2 = 165$$

$$4^{\text{th}} \text{ term} = 165 + 66/2 = 198 = M$$

$$5^{\text{th}} \text{ term} = 198 + 67 \times 2 = 332$$

$$6^{\text{th}} \text{ term} = 332 + 68/2 = 366 = N$$

From statement I, we have

$$X/(M+2) = 150/200 = 3:4$$

Thus, I is correct

From statement II, we have

$$N = 366 = 3 \times 2 \times 61$$

Thus, highest prime factor is 61

Thus, II is correct

From statement III, we have

$$Y = 186.$$

When three-digit number $14p$ is added to it, we get $(1+1)(8+4)(6+p)$

$$\Rightarrow (1+1)(8+4)(6+p) = 3p8$$

For $p=2$, we get

$$186 + 142 = 328$$

For other values of p , it isn't possible

So, p can have one value

Thus, III is not correct

6. Answer: A

For Series I,

4 is the average of consecutive prime numbers 3 and 5

6 is the average of consecutive prime numbers 5 and 7

12 is the average of consecutive prime numbers 11 and 13



The series is based on an average of 2 consecutive odd numbers which are also prime numbers

Similarly, 42 is the average of consecutive prime numbers 41 and 43

Thus, X must be an average of 59 and 61 i.e., 60 and Y must be an average of 71 and 73 i.e., 72.

=> X=60 and Y=72

For Series II,

$$1^{\text{st}} \text{ term} = 6 = 1^1 + 2^1 + 3^1 = 1 + 2 + 3 = 6$$

$$2^{\text{nd}} \text{ term} = 14 = 1^2 + 2^2 + 3^2 = 1 + 4 + 9 = 14$$

$$3^{\text{rd}} \text{ term} = 36 = 1^3 + 2^3 + 3^3 = 1 + 8 + 27 = 36$$

$$\text{Similarly, } 5^{\text{th}} \text{ term} = 98 = 1^5 + 2^5 + 3^5 = 1 + 32 + 243 = 276$$

$$\text{Thus, } M = 6^{\text{th}} \text{ term} = 1^6 + 2^6 + 3^6 = 794$$

$$N = 7^{\text{th}} \text{ term} = 1^7 + 2^7 + 3^7 = 1 + 128 + 2187 = 2316$$

Statement I:

$$X + 2Y - 10 = 60 + 144 - 10 = 194$$

Thus, $2316/194 = 1158/97 \Rightarrow 194$ isn't a factor of N or 2316.

=> I is wrong

Statement II:

$$M + X + Y = 794 + 60 + 72 = 926 > 900$$

Thus, II is correct

Statement III:

For M/p to be a prime number, p must be the highest divisible factor of M

$M = 794 = 397 \times 2$, both the factors are prime number

So, p must be 397 which is a prime number

So, III is wrong

Thus, only II is correct

7. Answer: D

Series I:

$$1^{\text{st}} \text{ term} = 15$$

$$2^{\text{nd}} \text{ term} = 15 \times 2 - 3 = 27$$

$$3^{\text{rd}} \text{ term} = 27 \times 2 + 3 = 57$$

$$4^{\text{th}} \text{ term} = 57 \times 2 - 3 = 111$$

$$5^{\text{th}} \text{ term} = 111 \times 2 + 3 = 225$$

$$\text{Thus, } X = 225 \times 2 - 3 = 447$$

$$Y = 447 \times 2 + 3 = 897$$

Series II:

$$1^{\text{st}} \text{ term} = 10$$

$$2^{\text{nd}} \text{ term} = 10^* - 1 + 1^2 = -9$$

$$3^{\text{rd}} \text{ term} = -9^* - 2 + 2^2 = 22$$

$$4^{\text{th}} \text{ term} = 22^* - 3 + 3^2 = -57$$

$$5^{\text{th}} \text{ term} = -57^* - 4 + 4^2 = 244$$

$$M = 244^* - 5 + 5^2 = -1195$$

$$N = -1195^* - 6 + 6^2 = 7206$$

Statement I:

$$N + Y = 7206 + 897 = 8103 = 3 \times 37 \times 73$$

Thus, the statement I is correct

Statement II:

$$k = 550 - X = 550 - 447 = 103 > 100$$

Thus, statement II is correct

Statement III:

$M + 1220 = -1195 + 1220 = 25 = 5^2$ which is a perfect square

Thus, III is also correct

8. Answer: C

For Series I,

$$1^{\text{st}} \text{ term} = 21$$

$$2^{\text{nd}} \text{ term} = 21 + 2 = 23 = X$$

$$3^{\text{rd}} \text{ term} = 23 + 12 = 35$$

$$4^{\text{th}} \text{ term} = 35 + 22 = 57 = Y$$

$$5^{\text{th}} \text{ term} = 57 + 32 = 89$$

$$6^{\text{th}} \text{ term} = 89 + 42 = 131$$

$$7^{\text{th}} \text{ term} = 131 + 52 = 183$$

For Series II,

$$1^{\text{st}} \text{ term} = 14$$

$$2^{\text{nd}} \text{ term} = 14 + 4 = 18 = M$$

$$3^{\text{rd}} \text{ term} = 18 + 40 = 58$$

$$4^{\text{th}} \text{ term} = 58 + 400 = 458 = N$$

$$5^{\text{th}} \text{ term} = 458 + 4000 = 4458$$

$$6^{\text{th}} \text{ term} = 4458 + 40000 = 44458$$

$$7^{\text{th}} \text{ term} = 44458 + 400000 = 444458$$

Statement I:

$$X + Y = 23 + 57 = 80$$

Thus, $X + Y > 80$ isn't correct

Statement II:

$$M - N = 18 - 458 = -400$$

-400 can not be a perfect square of a real number

Thus, II is also not correct

Statement III:

$$N + 54 = 458 + 54 = 512 \text{ this is a perfect cube of } 8.$$

Thus, 3rd statement is correct

Thus, only statement III is correct.

9. Answer: C

For Series I,

$$1^{\text{st}} \text{ term} = 18 + 2^2 = 22$$

$$2^{\text{nd}} \text{ term} = 22 + 4^2 = 38 = X$$

$$3^{\text{rd}} \text{ term} = 38 + 8^2 = 102$$

$$4^{\text{th}} \text{ term} = 102 + 2^3 = 110 = Y$$

$$5^{\text{th}} \text{ term} = 110 + 4^3 = 174$$

$$6^{\text{th}} \text{ term} = 174 + 8^3 = 686$$

For Series II,

$$1^{\text{st}} \text{ term} = 23$$

$$2^{\text{nd}} \text{ term} = 23 + (3-2)^2 = 24$$

$$3^{\text{rd}} \text{ term} = 24 + (4-2)^2 = 28$$

$$4^{\text{th}} \text{ term} = 28 + (8-2)^2 = 64 = M$$

$$5^{\text{th}} \text{ term} = 64 + (6-4)^2 = 68$$

$$6^{\text{th}} \text{ term} = 68 + (8-6)^2 = 72$$

$$7^{\text{th}} \text{ term} = 72 + (7-2)^2 = 97 = N$$

Statement I:

$$X^2 + M^2 = 1236 + 4096 = 5392$$

$$N^2 = 9409$$

=> X, M and N don't form a Pythagorean triplet

Statement I is incorrect

Statement II:

$$X + N = 36 + 97 = 133 \text{ which is not a prime number}$$

=> Statement II is incorrect

Statement III:

$$M + N = 64 + 97 = 161$$

Factors of 161 are 1, 23, 7 and 161

Thus, 161 has two prime factors

=> Statement III is correct

10. Answer: D

For series I,

$$1^{\text{st}} \text{ term} = 12$$

$$2^{\text{nd}} \text{ term} = 12 + 7 = 19$$

$$3^{\text{rd}} \text{ term} = 19 + 7 + 1^2 = 19 + 8 = 27$$

$$4^{\text{th}} \text{ term} = 27 + 8 + 2^2 = 27 + 12 = 39 = X$$

$$5^{\text{th}} \text{ term} = 39 + 12 + 3^2 = 39 + 21 = 60$$

$$6^{\text{th}} \text{ term} = 60 + 21 + 4^2 = 60 + 37 = 97 = Y$$

$$7^{\text{th}} \text{ term} = 97 + 37 + 5^2 = 97 + 62 = 159$$

For series II,

$$1^{\text{st}} \text{ term} = 2$$

$$2^{\text{nd}} \text{ term} = 2 * 1^2 - 1 = 1$$

$$3^{\text{rd}} \text{ term} = 1 * 2^2 - 2 = 2 = M$$

$$4^{\text{th}} \text{ term} = 2 * 3^2 - 3 = 15 = N$$

$$5^{\text{th}} \text{ term} = 15 * 4^2 - 4 = 236$$

$$6^{\text{th}} \text{ term} = 236 * 5^2 - 5 = 5895$$

$$7^{\text{th}} \text{ term} = 5895 * 6^2 - 6 = 212214$$

Statement I,

$$X + Y = 136 = 2^3 * 17^1$$

$$\text{Thus, number of factors} = (3+1) * (1+1) = 4 * 2 = 8$$

Statement I is correct

Statement II,

$$M + N = 2 + 15 = 17$$

$X + Y = 136$. 17 is a factor of 136 i.e., $M + N$ is a factor of $X + Y$

Statement II is correct

Statement III,

$N^2 + M = 15^2 + 2 = 227$ which is a prime number and is not divisible by anyone except 1 and 227.

Statement III is correct.

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