SINGLE OPTION CORRECT

1. In an Arithmetic Progression, if a = 30, d = - 5, n = 10, then a_n is:

   (A) - 13   (B) - 15   (C) - 14   (D) - 7

2. If a = 10 and d = 5, then first four terms will be:

   (A) 10, 30, 50, 60   (B) 10, 15, 20, 25   (C) 10, 15, 20, 25   (D) 10, 18,20,3

3. The nth term of an A.P. is given by $a_n = 1 + 2n$. The common difference is

   (A) 5   (B) 3   (C) 2   (D) 1

4. The nth term of an A.P. 5, 2, - 1, - 4, - 7 … is

   (A) 2n + 5   (B) 2n - 5   (C) 8 - 3n   (D) 3n - 8

5. The missing terms in AP: _____, 15, 11, _____, 3 are:

   (A) 11 and 7   (B) 17 and 8   (C) 19 and 8   (D) 19 and 7

6. Which term of the A.P. 3, 7, 11, 15, … is 63?

   (A) 12th   (B) 16th   (C) 15th   (D) 13th

7. The 10th term from the end of the A.P. 4, 9,14, …, 254 is

   (A) 209   (B) 205   (C) 214   (D) 213

8. If a, b, c, d, e are in A.P., then the value of a – 4b + 6c – 4d + e is

   (A) 0   (B) 1   (C) - 1   (D) 2

9. If 2x, x + 4, 3x + 4 are in A.P., then x is equal to

   (A) $\frac{2}{3}$ (B) $\frac{4}{3}$ (C) $\frac{5}{3}$ (D)1

10. Find the sum of 12 terms of an A.P. whose nth term is given by an = 3n + 4

    (A) 262   (B) 272   (C) 282   (D) 292

11. If the 2nd term of an AP is 13 and the 5th term is 28, then its 7th term is

    (A) 30   (B) 33   (C) 37   (D) 38

12. The sum of first 16 terms of the AP: 10, 6, 2, ... is

(A) - 320   (B) 320   (C) - 352   (D) - 400

13. The sum of all odd integers between 2 and 100 divisible by 3 is

(A) 817   (B) 867   (C) 876   (D) 786

14. If 7 times the 7th term of an A.P. is equal to 11 times its 11th term, then 18th term is

(A) 18   (B) 9   (C) 77   (D) 0

15. Two APs have the same common difference. The first term of one of these is – 1 and that of the other is – 8. Then the difference between their 4th terms is

(A) - 1   (B) - 8   (C) 7   (D) -9

16. In an AP if a = 1, a_n = 20 and S_n = 399, then n is

(A) 19   (B) 21   (C) 38   (D) 42

17. If the numbers n – 3, 4n – 2 and 5n + 3 are in AP, then the value of n is:

(A) 1   (B) 2   (C) - 1   (D) -2

18. The 21st term of the AP whose first two terms are -3 and 4 is

(A) -137   (B) 137   (C) 143   (D) -143

19. nth term of the sequence a, a + d, a + 2d, … is

(A) $a + nd$ (B) $a - (n - 1)d$ (C) $a + (n - 1)d$ (D) $n + nd$

20. The next term of the sequence $\frac{1}{1+\sqrt{x}}$, $\frac{1}{1-x}$, $\frac{1}{1-\sqrt{x}}$ is (x is not equal to 1)

(A) $1 + 2\sqrt{x}$ (B) $1 - 2\sqrt{x}$ (C) $\frac{1-2\sqrt{x}}{1-x}$ (D) $\frac{(1+2\sqrt{x})}{1-x}$

21. If T_9 of an A.P. is zero then the ratio of $T_{29} : T_{19}$ will be

(A) 1:2   (B) 2:1   (C) 1:3   (D) 3:1

22. There are 15 terms of an AP, its first term is 5 and their sum is 390, the middle term is

(A) 23   (B) 26   (C) 29   (D) 32

23. The sum of third and ninth term of an A.P. is 8. Find the sum of first 11 terms of the progression.

(A) 44   (B) 22   (C) 19   (D) None of these

24. There are 15 terms in an AP. Its first term is 5 and their sum is 390. The middle term is

(A) 23   (B) 26   (C) 29   (D) 32

25. A student reading a 426 - page book finds that he reads faster as he gets into the subject. He reads 19 pages on the first day, and his rate of reading then goes up by 3 pages each day. The number of days in which he will finish the book is:

(A) 12   (B) 11   (C) 10   (D) 8

26. Which of the following is/are True?

(A) $k^2 + 4k + 8, 2k^2 + 3k + 6, 3k^2 + 4k + 4$ are three consecutive terms of an AP, when k = 3

(B) $k^2 + 4k + 8, 2k^2 + 3k + 6, 3k^2 + 4k + 4$ are three consecutive terms of an AP, when k = 2

(C) $k^2 + 4k + 8, 2k^2 + 3k + 6, 3k^2 + 4k + 4$ are three consecutive terms of an AP, when k = 1

(D) $k^2 + 4k + 8, 2k^2 + 3k + 6, 3k^2 + 4k + 4$ are three consecutive terms of an AP, when k = 0

MULTIPLE OPTIONS CORRECT

1. Which of the following are false for an AP?

(A) $a_n = a + (n - 1)d$ (B) $a_n = a + n + (a - 1)d$ (C) $a_n = a + nd - d$ (D) $a_n = n + (d - 1)n$

2. The 11th term and 15th term of the AP: $-5, -\frac{5}{2}, 0, \frac{5}{2}, \ldots$ is

(A) $a_{11} = 20$ (B) $a_{15} = 35$ (C) $a_{11} = 25$ (D) $a_{15} = 30$

3. The first two terms are -3 and 4 then the 21st and 25th term of an AP are

(A) $a_{11} = 175$ (B) $a_{15} = 165$ (C) $a_{11} = 137$ (D) $a_{15} = 139$

4. Which of the following are AP?

(A) $a, a^2, a^3, a^4, \ldots$ (B) $\sqrt{2}, \sqrt{8}, \sqrt{18}, \sqrt{32}, \ldots$ (C) $1^2, 5^2, 7^2, 73, \ldots$ (D) $1^2, 3^2, 5^2, 7^2, \ldots$

5. Which of the following is/are not an AP?

(A) 4,7,13,17,21, …   (B) 1, -2, -5, -8, …   (C) $8, 11, 14, 17, 21, \ldots$ (D) $3, 8, 13, 18, \ldots$

6. Which term of the AP: 21, 42, 63, 84, … is 210 and 273?

(A) 9th and 11th   (B) 10th and 13th   (C) 9th and 12th   (D) 10th and 12th

7. Which of the following are True for an AP?

(A) $S_n = \frac{n}{2}[2a + (n - 1)d]$ (B) $S_n = \frac{n}{2}[a + a_n]$ (C) $S_n = \frac{n}{2}[2a + nd - d]$ (D) $S_n = \frac{a}{2}[2n + (a - 1)d]$

MATHSARC EDUCATION
A learning place to fulfill your dreams of success!
Mathsarc Education

IIT - JEE FOUNDATION

8. Given a = 7, $a_{13} = 35$ then which of the following is/are true?

(A) $d = \frac{7}{3}$ and $S_{13} = 373$ (B) $d = \frac{8}{3}$ and $S_{13} = 273$ (C) $d = \frac{7}{3}$ and $S_{13} = 273$ (D) $d = \frac{8}{3}$ and $S_{13} = 373$

9. Given $a = 8$, $a_n = 62$ and $S_n = 210$ then which of the following are true?

(A) $n = 7$ (B) $d = \frac{54}{5}$ (C) $n = 6$ (D) $d = \frac{54}{7}$

10. Given $d = 5$, $S_9 = 75$ then which of the following are false?

(A) $a = -\frac{35}{3}$ (B) $a_n = \frac{85}{3}$ (C) $a = -\frac{34}{3}$ (D) $a_n = \frac{84}{3}$

11. AP 9, 17, 25, 33, … then which of the following are true?

(A) The sum of first 11th term is 539   (B) The sum of first 15th term is 629

(C) The sum of first 11th term is 875   (D) The sum of first 15th term is 975

12. If the sum of first 7 terms of an AP is 49 and that of 17 terms is 289, then which of the following are not sum of first n terms?

(A) $S_n = (n^2 - 1)$ (B) $S_n = n^2$ (C) $S_n = (n^2 - n)$ (D) $S_n = n^2$

13. In an AP if $a = 1$, $a_n = 20$ and $S_n = 399$, then n is

(A) 19   (B) 21   (C) 38   (D) 42

14. Which of the following are True for an AP?

(A) $S_n = \frac{n}{2}[2(a_n - (n-1)d) + (n-1)d]$ (B) $S_n = \frac{n}{2}(a + a_n)$

(C) $S_n = \frac{n}{2}[2a + nd - d]$ (D) $a_n = a + (n-1)d$

15. The sum of first five multiples of 3 and 5 are

(A) 45 and 75   (B) 55 and 85   (C) 65 and 95   (D) 75 and 45

16. $1 + 4 + 7 + 10 + \cdots + x = 287$ then x is

(A) 35   (B) 40   (C) 45   (D) 50

17. The four consecutive numbers in AP are

(A) $a, a + d, a - d, d$ (B) $a - 3d, a - d, a + d, a + 3d$

(C) $a - 3d, a + d, a - d, a + 3d$ (D) $a, a + d, a + 3d, a - 3d$

18. If S_n denotes the sum of first n terms of an AP, then which of the following is/are True

(A) $S_{10} = 3(S_8 - S_4)$ (B) $S_{12} = 3(S_8 - S_4)$ (C) $S_{12} = 6(S_8 - S_4)$ (D) $S_{10} = 6(S_8 - S_4)$

19. If AP: $11, a, 27, b, 43, 51$ then which of the following is/are True?

    (A) $a = 19$ (B) a = 17   (C) b = 35   (D) b = 37

20. 2x, x + 8, 3x + 1 are in A.P., then which of the following statement is correct

    (A) $x = 5$ (B) $T_7 = 28$ (C) $S_{10} = 235$ (D) Common difference =3

INTEGER TYPE

1. Which of the following list of numbers form AP? If they form AP, write the next two terms:

    (i)   3, 9, 15, 21, …   (ii) -3, 3, -3, 3, ….

2. If the following form AP then Find d common difference and write three more terms.

    (i) $1^2, 3^2, 5^2, 7^2, …$ (ii) $\sqrt{3}, \sqrt{6}, \sqrt{9}, \sqrt{12}, …$

3. If the numbers $n - 2, 4n - 1$ and $5n - 2$ are in AP, find the value n.

4. If the nth terms of the two APs: $9, 7, 5, …$ and $24, 21, 18, …$ the same, find the value of n. Also find that term.

5. If the sum of the 3rd and 8th terms of an AP is 7 and the sum of the 7th and the 14th terms is -3, find the 10th term.

6. If $a_n = 3 - 4n$, show that $a_1, a_2, a_3, …$ form an AP. Also find S_{20}.

7. If the 9th term of an AP is zero, prove that its 29th term is twice its 19th term.

8. If AP: -11, - 7, - 3, …, 49 then find the value of the middle most term (s) of the AP.

9. Suppose the sum of all the 11th term of an AP is 36 and that of the first 16th term is 256, find the sum of first 10 terms.

10. If $S_n = n(4n + 1)$ in an AP then find the AP.

11. The number of terms in the series 101 + 99 + 97 +……..+ 47 is n, then $\dfrac{n}{7}$ is

12. Mr. Sameer started work in 2011 at an annual salary of Rs. 4,00,000 in a reputed company and he received a Rs. 50,000 increment each year. In which year his annual salary will be Rs. 16,00,000?

13. Find the sum of all two digit multiples of 3.

SUBJECTIVE PROBLEMS

1. Write first four terms of the AP, when the first term a and common difference d are given as follows:

   (i) a = 7 and d = -3   (ii) a = 1.75 and d = 0.25

2. For the following APs, Write the first term and common difference:

   (i) - 6, -2, 2, 6, …   (ii) 0,7, 1.0, 1.3, 1.6, …

3. Which of the following is APs? If they form an AP, find the common difference d and write three more terms.

   (i) - 1.2, - 3.2, - 5.2, - 7.2, …   (ii) 0.3, 0.33, 0.333, 0.3333, …

4. In the following APs, find the missing terms in each of boxes:

   (i) -2, __, __, __, 18   (ii) __, 41, __, __, __, 25

5. Check whether -120 is term of AP: 11, 8, 5, 2, …

6. For what value of k will K+9, 2k-1 and 2k+7 are the consecutive terms of an AP?

7. If the nth term of an AP is pn+q, find its common difference.

8. An AP consists of 50 terms of which 3rd term is 17 and last term is 158, Find the 24th term.

9. The 13th term of an AP exceeds its 8th term by 16. Find the common difference.

10. Two APs have the same common difference. The difference between their 100th terms is 100, what is the difference between their 1000th terms?

11. How many Multiples of 3 lie between 10 and 250?

12. Rohan saved Rs. 7 in the first week of a year and then increased her weekly savings by Rs. 1.25. If the nth week, his weekly savings become Rs 23.25, find n.

13. Find the sum of the following AP

   (i) 0.7, 1.5, 2.3, 3.1, 3.9, … to 100 terms   (ii) $\frac{1}{15}, \frac{1}{12}, \frac{1}{10}$, ..., to 11 terms

14. In an AP;

   (i) Given $d = 5, S_9 = 75$, find a and a_n

   (ii) Given $l = 28, S = 144$ and there are total 9 terms. Find a

15. The first and the last terms of an AP are 8 and 65 respectively. If the sum of all its terms is 730, how many terms are there and the common difference?

16. If the sum of first 7 terms of an AP is 49 and that of 17 terms is 289, find the sum of first n terms.

17. Find the sum of all three digit natural numbers, which are multiples of 11.

18. Find the sum of odd numbers between 0 and 100.

MATHSARC EDUCATION
A learning place to fulfill your dreams of success!

IIT - JEE FOUNDATION

19. Find the value of the middle term of the following A.P. 17, 26, 35, 44, 53, …, 350.

20. If the sum of the first n terms of an AP is $4n - n^2$, what is the first term (that is S_1)? What is the sum of first two terms? What is the second term? Find the 3rd, the 10th and the nth terms.

21. A contract on construction job specifies a penalty for delay of completion beyond a certain date as follows: Rs 200 for the first day, Rs 250 for the second day, Rs 300 for the third day, etc, the penalty for each succeeding day being Rs 50 more than for the preceding day. How much money the contractor has to pay as penalty, if he has delayed the work by 30 days?

22. A sum of Rs 700 is to be used to give seven cash prizes to students of a school for their overall academic performance. If each prize is Rs 20 less than its preceding prize, find the value of each of the prizes.

23. Jaspal Singh repays his total loan of Rs 118000 by paying every month starting with the first instalment of Rs 1000. If he increases the instalment by Rs 100 every month, what amount will be paid by him in the 30th instalment? What amount of loan does he still have to pay after the 30th instalment?

24. The students of a school decided to beautify the school on the Annual Day by fixing colorful flags on the straight passage of the school. They have 27 flags to be fixed at intervals of every 2 m. The flags are stored in the position of the middle most flag. Ruchi was given the responsibility of placing the flags. Ruchi kept her books where the flags were stored. She could carry only one flag at a time. How much distance she covers in completing this job and returning back to collect her books? What is the maximum distance she travelled carrying a flag?

25. 200 logs are stacked in the following manner: 20 logs in the bottom row, 19 in the next row next to it and so on. In how many rows the 200 logs placed and how many logs are in the top row?

26. The sum of three numbers in A.P. is –3, and their product is 8. Find the numbers.

27. The 2nd term of an A.P. is nine times the 5th term and the sum of the first eight terms is 56. Find the first term and the common difference.

28. Find the ratio of the sum of the first 24 and 36 terms of the A.P. 5, 8, 11, 14, …

Mathsarc Education®
A learning place to fulfill your dreams of success!

☺
Keep smiling!

Visit Us: https://www.mathsarc.com

ANSWER KEY & SOLUTION

SINGLE OPTION CORRECT

1. B	2. C	3. C	4. C
5. D	6. B	7. A	8. A
9. B	10. C	11. B	12. A
13. B	14. D	15. C	16. C
17. C	18. B	19. C	20. D
21. B	22. B	23. A	24. B
25. A	26. D		

MULTI OPTIONS CORRECT

1. B, D	2. A, D	3. A, D	4. B
5. C	6. B	7. A, B, C	8. C
9. B, C	10. A, B	11. A, D	12. D
13. C	14. A, B, C, D	15. A	16. B
17. B	18. B	19. A, C	20. A, B, C, D

INTEGER TYPE

11. 4	12. 2035	13. 1665

SUBJECTIVE

26. 2, – 1, – 4	27. 35, – 8	28. 158/345