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ARITHMETIC PROGRESSIONS

OBJECTIVE SECTION

[BASIC/STANDARD]

I. MULTIPLE CHOICE QUESTIONS

- The 10th term of the AP 5, 8, 11, 14, ... is:
 (a) 32 (b) 35 (c) 38 (d) 185
- In an AP, if $a = -7.2$, $d = 3.6$, $a_n = 7.2$, then n is:
 (a) 1 (b) 3 (c) 4 (d) 5
- In an AP, if $d = -4$, $n = 7$, $a_n = 4$, then a is:
 (a) 6 (b) 7 (c) 20 (d) 28
- In an AP, if $a = 3.5$, $d = 0$, $n = 101$, then a_n will be:
 (a) 0 (b) 3.5 (c) 103.5 (d) 104.5
- The list of numbers -10, -6, -2, 2, ... is:
 (a) an AP with $d = -16$ (b) an AP with $d = 4$
 (c) an AP with $d = -4$ (d) not an AP
- The 11th term of the AP $-5, \frac{-5}{2}, 0, \frac{5}{2}, \dots$ is:
 (a) -20 (b) 20 (c) -30 (d) 30
- The first four terms of an AP, whose first term is -2 and the common difference is -2, are:
 (a) -2, 0, 2, 4 (b) -2, -4, -8, -16 (c) -2, -4, -6, -8 (d) -2, -4, -8, -16
- The 21st term of the AP whose first two terms are -3 and 4 is:
 (a) 17 (b) 137 (c) 143 (d) -143
- If the 2nd term of the AP is 13 and the 5th term is 25, then its 7th term is:
 (a) 30 (b) 33 (c) 37 (d) 38
- Which term of the AP : 21, 42, 63, 84, ... is 210?
 (a) 9th (b) 10th (c) 11th (d) 12th
- 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
- If 7 times the 7th term of an AP is equal to 11 times its 11th term, then its 18th term will be:
 (a) 7 (b) 11 (c) 18 (d) 0

13. The 4th term from the end of the AP : $-11, -8, -5, \dots, 49$ is:
 (a) 37 (b) 40 (c) 43 (d) 58
14. If the first term of an AP is -5 and the common difference is 2, then the sum of the first 6 terms is:
 (a) 0 (b) 5 (c) 6 (d) 15
15. The sum of first 16 terms of the AP $11, 6, 2, \dots$ is:
 (a) -424 (b) 320 (c) -352 (d) -400
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. The sum of first five multiple of 3 is:
 (a) 45 (b) 55 (c) 65 (d) 75
18. Sum of n terms of the series $\sqrt{2} + \sqrt{8} + \sqrt{18} + \sqrt{32} + \dots$ is:
 (a) n^2 (b) $n(n+1)$ (c) $\frac{n(n+1)}{\sqrt{2}}$ (d) 1
19. In an AP, $S_p = q$, $S_q = p$ and S_r denotes the sum of first r terms. Then S_{p+q} is equal to :
 (a) $-(p+q)$ (b) 1 (c) 0 (d) pq
20. If the sum of n terms of an A.P. is $3n^2 + 5n$, then which of its terms is 164?
 (a) 25^{th} (b) 26^{th} (c) 27^{th} (d) 28^{th}
21. If the sum of n terms of an A.P. is $2n^2 + 5n$, then which of its terms is 143?
 (a) 32 (b) 35 (c) 38 (d) 185
22. If the sum of n terms of an A.P. is $3n^2 - 5n$, then which of its terms is 154?
 (a) 23^{rd} (b) 24^{th} (c) 25^{th} (d) 27^{th}
23. The 17th term of an AP exceeds its 10th term by 7. Its common difference is:
 (a) 3 (b) 2 (c) -1 (d) 1
24. If 3rd and the 9th terms of an AP are 4 and -8 respectively, then which term of the AP is zero?
 (a) 3rd (b) 4th (c) 5th (d) 6th
25. The sum of 4th and 8th terms of an AP is 24 and the sum of the 6th and 10th terms is 44, then first term of the AP is :
 (a) -12 (b) -13 (c) 13 (d) 12
26. 30th term of the A.P. $10, 7, 4, \dots$ is :
 (a) 97 (b) 77 (c) -77 (d) 87
27. 11th term of the A.P. $-3, -\frac{1}{2}, -2, \dots$ is :
 (a) 28 (b) 22 (c) -38 (d) $-48\frac{1}{2}$
28. Total number of terms in the AP: $7, 16, 25, \dots, 349 =$
 (a) 35 (b) 36 (c) 37 (d) 39
29. The value of p , if the numbers $x, 2x + p, 3x + 6$ are three consecutive terms of an A.P. is :
 (a) 3 (b) 2 (c) 5 (d) 7

30. The common difference of an AP, whose first term is $\frac{1}{2}$ and the 8th term is $\frac{17}{6}$ =
 (a) $\frac{1}{3}$ (b) $\frac{3}{2}$ (c) $\frac{5}{2}$ (d) $\frac{7}{6}$
31. If 6th term of an AP is -10 and its 10th term is -26 then 15th term of the AP is :
 (a) -32 (b) 42 (c) -46 (d) 48
32. The sum of first 25 terms of an AP, whose n th term is given by $a_n = 7 - 3n$ is :
 (a) 500 (b) 600 (c) 700 (d) -800
33. The 16th term of an AP is 1 more than twice its 8th term. If the 12th term of the AP is 47, then its n th term is :
 (a) $2n + 2$ (b) $4n - 1$ (c) $2n - 2$ (d) $4n + 1$
34. If the 11th term of an AP is 38 and the 16th term is 73, then its 31st term is :
 (a) 172 (b) 176 (c) 178 (d) 180
35. 8th term of the AP 5, 8, 11, ... 38 from the end is :
 (a) 11 (b) 15 (c) 17 (d) 26
36. Sum of all multiples of 7 lying between 500 and 900 is :
 (a) 35600 (b) 39900 (c) 38600 (d) 37500
37. If the sum of first n terms of an AP is $5n^2 - 3n$, then its 16th, term is :
 (a) 150 (b) 152 (c) 154 (d) 156
38. If the n th term of an AP is given by $3 + \frac{2}{3}n$, then the sum of the first 31 terms =
 (a) $\frac{1371}{3}$ (b) $\frac{1271}{3}$ (c) $\frac{1351}{3}$ (d) $\frac{1971}{3}$
39. The 17th term of an AP is 5 more than twice its 8th term. 11th term of the AP is :
 (a) $12d - 5$ (b) $12d + 5$ (c) $12d$ (d) $5d - 12$
40. The 9th term from the end of the AP : 5, 9, 13, ..., 185 is :
 (a) 150 (b) 151 (c) 152 (d) 153
41. Total number of integers between 200 and 500 which are divisible by 8 is :
 (a) 37 (b) 38 (c) 40 (d) 42
42. The common difference of an AP in which $a_{21} - a_7 = 84$, is :
 (a) 4 (b) 5 (c) 6 (d) 7
43. If an AP, common difference (d) = -4 and the seventh term (a_7) is 4, then its first term is :
 (a) 25 (b) 26 (c) 27 (d) 28
44. Total number of two digit numbers which are divisible by 3 =
 (a) 26 (b) 27 (c) 28 (d) 30
45. Total number of terms in the AP: 18, $15\frac{1}{2}$, 13, ..., -47 =
 (a) 23 (b) 24 (c) 25 (d) 27
46. If the n th term of an AP is $2x - 1$, then its 20th term is :

- (a) 33 (b) 34 (c) 36 (d) 39
47. $1 + 3 + 5 + 7 \dots + 199 =$
 (a) 9000 (b) 10000 (c) 11000 (d) 12000
48. $3 + 11 + 19 \dots + 803 =$
 (a) 40404 (b) 50505 (c) 40303 (d) 70707
49. If $S_n = 3n^2 - n$, then common difference of the AP is :
 (a) 5 (b) 6 (c) -5 (d) -6
50. $1 + 3 + 5 + 7 + \dots + 1001 =$
 (a) 241001 (b) 251001 (c) 201001 (d) 271001

II. FILL IN THE BLANKS

- If the sum of 7 terms of an AP is 49 and that of 17 terms is 289, then the sum of its n terms = _____.
- The sum of first n terms of an AP is $5n^2 + 3n$. If its m th term is 168, then the value of $m =$ _____.
- The sum of first 30 positive integers divisible by 6 = _____.
- The sum of all odd integers between 1 and 100 = _____.
- If the sum of first four terms of an AP is 40 and that of fourteen terms is 280, then sum of first n terms is _____.
- The sum of first seven numbers which are multiples of 2 as well as 9 = _____.
- If the sum of the 5th and 7th terms of an AP is 52 and 10th term is 46, then the AP _____.
- If 7 times the 7th term of an AP is equal to 11 times its 11th term, then 18th term of the AP = _____.
- The 10th term from the end of the AP: 8, 10, 12, ..., 126 = _____.
- If the sum of first m terms of an AP is $2m^2 + 3m$, then its second term = _____.
- If the n th term of an AP is $(2n + 1)$, then the sum of its first three terms = _____.
- If k , $2k - 1$ and $2k + 1$ are three consecutive terms of an AP, then value of $k =$ _____.
- Two AP's 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 = _____.
- The sum of the first 40 positive integers divisible by 6 is _____.
- The first term of an AP is 5, the last term is 45 and the sum is 400, then its common difference is _____.

III. VERY SHORT ANSWER QUESTIONS

- What is an infinite AP?
- Write the general form of an AP.
- Find the common difference of the AP -5, -5, -5, -5,
- Can the common difference of an AP be negative?
- Write the formula for finding the n th term of an AP.
- Write the formula for the sum of first n terms of an AP in terms of first and last terms.
- What is the sum of first n natural numbers?

8. $a_n = S_n - S_{n-1}$. Is it true?
9. What is the sum of first n odd natural numbers?
10. n th term of an AP can be a quadratic polynomial in n . Is it true?
11. Find the common difference of the AP $\frac{1}{a}, \frac{3-a}{3a}, \frac{3-2a}{3a}, \dots, a \neq 0$. [CBSE 2019]
12. How many 2-digit numbers are divisible by 3? [CBSE 2019]
13. In an AP if the common difference(d) = -4 and the seventh term (a_7) is 4, find the first term. [CBSE 2019]
14. What is the common difference of an AP in which $a_{21} - a_7 = 84$? [CBSE 2018]

ANSWERS

I. Multiple Choice Questions :

- | | | | | | |
|---------|---------|---------|---------|---------|---------|
| 1. (a) | 2. (d) | 3. (d) | 4. (b) | 5. (b) | 6. (b) |
| 7. (c) | 8. (b) | 9. (b) | 10. (b) | 11. (c) | 12. (d) |
| 13. (b) | 14. (a) | 15. (a) | 16. (c) | 17. (a) | 18. (c) |
| 19. (a) | 20. (c) | 21. (b) | 22. (d) | 23. (d) | 24. (c) |
| 25. (b) | 26. (c) | 27. (b) | 28. (d) | 29. (a) | 30. (a) |
| 31. (c) | 32. (d) | 33. (b) | 34. (c) | 35. (c) | 36. (b) |
| 37. (b) | 38. (a) | 39. (a) | 40. (c) | 41. (a) | 42. (c) |
| 43. (d) | 44. (d) | 45. (d) | 46. (d) | 47. (b) | 48. (c) |
| 49. (b) | 50. (b) | | | | |

II. Fill in the Blanks :

- | | | | | |
|----------|--------------------|---------|----------|-------------------|
| 1. n^2 | 2. 17 | 3. 2790 | 4. 2499 | 5. $6n + n^2$ |
| 6. 504 | 7. 10, 14, 18 | 8. 0 | 9. 108 | 10. 9 |
| 11. 15 | 12. 3 | 13. 7 | 14. 4920 | 15. $\frac{8}{3}$ |

III. Very Short Answer Questions :

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|---------------------------------|--------|-----------------------|-----------------------|
| 2. $a, a + d, a + 2d, \dots, 0$ | 3. Yes | 5. $a_n = a + (n-1)d$ | 6. $\frac{n}{2}(a+l)$ |
| 7. $\frac{n(n+1)}{2}$ | 8. Yes | 9. $\frac{n(n-1)}{2}$ | 10. No |
| 12. 30 | 13. 28 | 14. 6 | 11. $-\frac{1}{3}$ |