Sequence and Series

MATHEMATICS Comprehensive Book QUESTIONS Which among the following is an Arithmetic progression? (a) $\frac{1}{2}, \frac{7}{10}, \frac{9}{10}, 1, \dots$ (b) $\sqrt{3}, \sqrt{27}, \sqrt{75}, \sqrt{147}, \dots$ (c) $2^3, 2^6, 2^9, 2^{12}, \dots$ (d) -2, 0, -2,(e) None of these If 18th term of an A.P. is 26 and 32th of an A.P. is – 16, of the A.P. is (a) -51 (b) 51 (c) -27 (d) 77 (e) None of these Find the sum of n terms of the series whose n^{th} term is 3n - 2. (a) $\frac{n}{2}(3n-1)$ (b) $\frac{n}{2}(3n+1)$ (c) $\frac{n}{2}(3n-3)$ (d) $\frac{n}{2}(2n-1)$ (e) None of these If S_n of a series is $\frac{35n}{2} \cdot \frac{7n^2}{2}$ then find its 7th term. (a) 21 (b) 35 (c) 18 (d) -28 (e) None of these The sum of the first three terms (S₃) of on A.P. is 108 and if it is given that $a_1a_2 + S_3 = 0$ then find the value of its seventh term where a_1 , a_2 are first and second term of the A.P. (a) 225 (b) 231

- (c) 216 (d) 229
- (e) None of these

1.

2.

3.

4.

5.

6. The trees of a row of a garden are numbered consecutively from 1 to 49. There is a value of p such that the sum of the numbers of trees preceding the tree numbered p is equal to the sum of the numbers of the houses following it, then value of p is:

(a) 25	(b) 35
(c) 28	(d) 22

(e) None of these

7. Find the sum of all three-digit numbers which are divisible by 3.

(a) 165150	(b) 195240
(c) 199950	(d) 201750

(e) None of these

8. The sum of the 7th and 9th term of an A.P. is 82 and the 10th term is 56. The first term of this A.P. is

	(a) 7.5	(b) -7.5	
	(c) -11.5	(d) 15	
	(e) None of these		
9.	Split 312 into three distinct parts such the	nat these are in A.P. and the product of its smeller parts is	
	9880. Find the value of its largest part.		
	(a) 102	(b) 109	
	(c) 113	(d) 108	
	(e) None of these		
10.	If 12 th term of an A.P. is zero then its 22 ⁿ	^d term is one third of its	
	(a) 45 th term	(b) 36 th term	
	(c) 44 th term	(d) 42 nd term	
	(e) None of these		
11.	. Find the sum of those numbers, which lie between 400 and 900 (including both) and leave a remain		
	4 on dividing by 7.		
	(a) 41302	(b) 46609	
	(c) 46908	(d) 48708	
	(e) None of these		
12.	If $\frac{p^{n-1} + q^{n-1}}{p^{n-2} + q^{n-2}}$ is the arithmetic mean betwee	en p and q then find the value of n.	
	(a) 0	(b) 1	
	(c) 2	(d) 3	
	(e) None of these		
13.	The sum of first eight terms of an A.P. is 6	66 and the ratio of its 13^{th} term to its 21^{st} term is 7:11. Find	
	the sum of first 31 terms of this A.P.		
	(a) 885	(b) 765	
	(c) 668	(d) 826	
	(e) None of these		
14.	If the p th term of an A.P. is $\frac{1}{q}$ and q^{th} term is $\frac{1}{p}$ then sum of its pq terms is		
	(a) $\frac{1}{2}(p+q)$	(b) $\frac{1}{2}(pq+1)$	
	(c) $\frac{1}{2}$ pq	(d) $\frac{1}{2}$ q	

(e) None of these

15. If the ratio of the sums of m^2 and n^2 of an AP is $m^3 : n^3$, the of its m^2 and n^2 terms is _____

(a)
$$\frac{2m^2 + mn}{2n^2 + mn}$$
 (b) $\frac{2m^2 + mn - 1}{2n^2 + mn - 1}$

(c)
$$\frac{m^2 + mn - 2}{n^2 + mn - 2}$$
 (d) $\frac{2m^2 + mn + 1}{2n^2 + mn + 1}$

- (e) None of these
- 16. If there are (2n 1) terms in an A.R, the of the of its terms to its even terms is _____
 - (a) $\frac{n+1}{n}$ (b) $\frac{n-1}{n}$
 - (c) $\frac{n}{n-1}$ (d) $\frac{n}{n+1}$
 - (e) None of these
- 17. 315 workers were engaged to finish a piece of work in a fixed number of days. Four workers were dropped the second day, four more workers were dropped the third day and so on. Thus, it took 8 more days to complete the work. Find the number of days in which the work was completed.

(a) 33	(b) 44	2
(c) 36	(d) 3 [.]	9

(e) None of these

18. The ratio of the sum of n terms of two arithmetic progressions is (5n + 1): (2n + 15). Find the ratio of their mth terms.

(a)	$\frac{10m-4}{4m+13}$	(b)	$\frac{5m+3}{7m+11}$
(c)	$\frac{7m-3}{5m+13}$	(d)	$\frac{4m-5}{3n+11}$

(e) None of these

19. In an A.P., the sum of its first n terms is $\frac{5n^2}{3} + \frac{13n}{5}$. Find its nth terms.

(a)
$$\frac{50n-14}{15}$$
 (b) $\frac{50n+14}{15}$
(c) $\frac{64(2n-1)}{15}$ (d) $\frac{64(2n+1)}{15}$

(e) None of these

20. If the sum of m, 2m, 3m terms of an A.P. are S_1, S_2, S_3 respectively, then $(S_2 - S_1)$ equals to _____

- (a) $2S_3$ (b) $3S_3$
- (c) $\frac{s_3}{2}$ (d) $\frac{s_3}{3}$

(e) None of these

If the sum of the first m, n, r terms of an A.P. are a, b, c respectively, then $\frac{a}{3}(n-r) + \frac{b}{n}(r-m) + \frac{c}{r}(m-n)$ 21. equals to _____ (a) 0 (b) 1 (c) m + n + r(d) 2 (e) None of these 22. If sum of first p terms of an A.P. is equal to q and the sum of first q terms of it is equal to p, then find the sum of (p + q) terms of this A.P. (b) -(p + q)(a) p+q(c) - p + q(d) 1 (e) None of these If 19th term of an A.P. is 544 and 544th term is 19 then find the term which is equal to zero? 23. (b) 563 (a) 525 (c) 562 (d) 544 (e) None of these Sum of n terms of the series $\sqrt{80}, \sqrt{45}, \sqrt{20}, \dots$ is 24. (a) $\frac{\sqrt{5n}}{2}(9-n)$ (b) $4\sqrt{5}(9-n)$ (d) $3\sqrt{5}(3-n)$ (c) $2\sqrt{5}(9-n)$ (e) None of these 25. If p, q, r are in A.P., then q + r, r + p and p + q are in ____ (a) arithmetic progression (b) geometric progression (c) harmonic progression (d) arithmetic-geometric progression (e) None of these ath, bthand cth terms If **26**. of H.P. an are p, q and r respectively, the value of qr(b-c)+pr(c-a)+pq(a-b)(a) -1 (b) 1 (c) 0 (d) 2q (e) None of these If (a + 1), (b + 1), (c + 1), (d + 1) are in G.P., then $(b + c + 2)^2 =$ _____ 27. (b) (a + b + 1) (c + d + 1) 2(a) (a+b+2)(b+c+2)(d) (a + b + 1) (b + c + 1)(c) (a+b+2) (b+c+2)(e) None of these

28. Find the value of P, if $P = 1 + (1 + 2) + (1 + 2 + 3) + (1 + 2 + 3 + 4) + \dots + (1 + 2 + 3 + \dots + 25)$

- (a) 2715 (b) 2925
- (c) 3055 (d) 2655
- (e) None of these

29. Find the sum to n terms of the following series. 3+33+333+.....

- (a) $\frac{10}{27}(10^{N}-1)$ (b) $\frac{50}{81}(10^{N}-1)-\frac{5n}{9}$ (c) $\frac{10}{27}(10^{N}-1)-\frac{n}{3}$ (d) $\frac{50}{81}(10^{N}-1)$
- (e) None of these

30. If the first and 10th terms of a G.P. are $\frac{q^6}{q^5}$ and $\frac{p^4}{q^3}$, then find the ratio between its 6th to 7th term.

- (a) $\frac{q^2}{p^3}$ (b) $\frac{q}{p^2}$ (c) $\frac{q}{p}$ (d) $\frac{p^2}{q}$
- (e) None of these
- 31. If $A = 5 + \frac{5}{B} + \frac{5}{B^2} + \frac{5}{B^3} + \dots \infty$ then the value of B is_____

(a)
$$\frac{-A}{A-5}$$
 (b) $\frac{A}{A-5}$
(c) $\frac{A}{A+5}$ (d) $\frac{-A}{A+5}$

(e) None of these

32. If
$$\mathbf{Q} = \frac{3}{\sqrt{3}} + 1 + \frac{1}{\sqrt{3}} + \frac{1}{3} + \dots \infty$$
 then find the value of $\mathbf{Q} - \frac{1}{\mathbf{Q}}$
(a) $\frac{3\sqrt{3}-1}{6}$ (b) $\frac{7\sqrt{3}+11}{6}$
(c) $\frac{3\sqrt{3}+1}{6}$ (d) $\frac{7\sqrt{3}-11}{6}$

(e) None of these

33. Find the value of x (where $o^{\circ} < x < 90^{\circ}$) if $32^{1+sinx+sin^{2}x+....x^{\circ}} = 1024$

- (a) 30° (b) 45°
- (c) 60° (d) 15°
- (e) None of these

34.	Find the value of 7 th term of the series.		
	(a) $\frac{-12}{}$	(b) -24	
	11		
	(c) -16	(d) $\frac{-12}{7}$	
	(e) None of these		
35.	lf p, q and r are in Harmanic Progression	n, then, $\frac{p}{q+r}, \frac{q}{p+r}$ and $\frac{r}{p+q}$ are in	
	(a) arithmetic progression	(b) geometric progression	
	(c) harmonic progression	(d) arithmetic-geometric progression	
	(e) None of these		
36.	If A, G and H are respectively arithm	etic, geometric and harmonic means between two distinct	
	positive real numbers p and q , then which	ch one of the following is incorrect?	
	(a) $G^2 = AH$	(b) $A - G > 0$	
	(c) $G - H > 0$	(d) $A < G < H$	
	(e) None of these		
37.	If p, q and r are the a^{th} , b^{th} and c^{th} term	ns respectively of an A.P. as well as G.P., then the value of	
	$\mathbf{n}^{\mathbf{q}-\mathbf{r}}$ $\mathbf{a}^{\mathbf{r}-\mathbf{p}}$ $\mathbf{r}^{\mathbf{p}-\mathbf{q}}$ equals to		
		(b) 1	
	$(a) \cup (a) $	(0) 1 (d) 2	
	(c) = 1	(u) 2	
	(e) None of these		
38.	On inserting 5 Arithmetic means betwee	and 27, the sum of these five terms is equal to	
	(a) six times the A.M. between 3 and 27	(b) five times the A.M. between 3 and 27	
	(c) 105	(d) 72	
90	(e) None of these		
39.	The Arithmetic Mean of two numbers is	5 more than geometric Mean and 9.8 more than harmonic	
	mean. Find the numbers.	(1-) 20, 120	
	(a) $20, 80$	(6) 30, 120	
	(c) $90,100$	(d) 160, 250	
	(e) None of these	0	
40.	If third and eighth terms of a Geometri	c progression are $\frac{3}{16}$ and 6 respectively, then find the 10^{th}	
	term of the series.		
	(a) 16	(b) $\frac{1}{8}$	
	(c) $\frac{1}{12}$	(d) 24	
	(e) None of these		

ANSWER - KEY				
1. (b)	2. (d)	3. (a)	4. (d)	5. (b)
6. (b)	7. (a)	8. (c)	9. (c)	10. (d)
11. (c)	12. (d)	13. (e)	14. (b)	15. (b)
16. (c)	17. (c)	18. (a)	19. (b)	20. (d)
21. (a)	22. (b)	23. (b)	24. (a)	25. (a)
26. (c)	27. (a)	28. (b)	29. (c)	30. (c)
31. (b)	32 . (b)	33. (a)	34. (a)	35. (c)
36. (d)	37. (b)	38. (b)	39. (c)	40. (d)