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CTQ - 2023

CTQ : Concept Through Questions

Year : 2023

Topic : Progression I

- $x^{\frac{1}{2}}, x^{\frac{1}{4}}, x^{\frac{1}{8}}, x^{\frac{1}{16}} \dots$ to ∞ is equal to
(a) 0 (b) 1
(c) x (d) ∞ [Video Solution](#)
- If $\frac{1}{b+c}, \frac{1}{c+a}, \frac{1}{a+b}$ are in A.P., then
(a) a, b, c are in AP (b) a^2, b^2, c^2 are in AP
(c) $\frac{1}{a}, \frac{1}{b}, \frac{1}{c}$ are in AP (d) None of these [Video Solution](#)
- If a, b, c are in A.P. as well as in G.P. then
(a) $a = b \neq c$ (b) $a \neq b = c$
(c) $a \neq b \neq c$ (d) $a = b = c$ [Video Solution](#)
- If $A_1, A_2; G_1, G_2$ and H_1, H_2 be two AM's, GM's and HM's between two quantities, then the value of $\frac{G_1 G_2}{H_1 H_2}$ is
(a) $\frac{A_1 + A_2}{H_1 + H_2}$ (b) $\frac{A_1 - A_2}{H_1 + H_2}$
(c) $\frac{A_1 + A_2}{H_1 - H_2}$ (d) $\frac{A_1 - A_2}{H_1 - H_2}$ [Video Solution](#)
- The sum of all odd numbers between 1 and 1000 which are divisible by 3, is
(a) 83667 (b) 90000
(c) 83660 (d) None of the above [Video Solution](#)
- The sum of the series $\frac{1}{1+1^2+1^4} + \frac{1}{1+2^2+2^4} + \frac{1}{1+3^2+3^4} + \dots$ to n terms is
(a) $\frac{n(n^2+1)}{n^2+n+1}$ (b) $\frac{n(n+1)}{2(n^2+n+1)}$
(c) $\frac{n(n^2-1)}{2(n^2+n+1)}$ (d) None of these [Video Solution](#)
- Number of identical terms in the sequence 2, 5, 8, 11, ... upto 100 terms and 3, 5, 7, 9, 11, ... upto 100 terms, are
(a) 17 (b) 33
(c) 50 (d) 147 [Video Solution](#)
- $\frac{(666 \dots 6)^2}{n \text{ digits}} + \frac{(888 \dots 8)}{n \text{ digits}}$ is equal to
(a) $\frac{4}{9}(10^n - 1)$ (b) $\frac{4}{9}(10^{2n} - 1)$
(c) $\frac{4}{9}(10^n - 1)^2$ (d) None of these [Video Solution](#)
- The sum to n terms of the infinite series $1.3^2 + 2.5^2 + 3.7^2 + \dots \infty$ is
(a) $\frac{n}{6}(n+1)(6n^2 + 14n + 7)$
(b) $\frac{n}{6}(n+1)(2n+1)(3n+1)$



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(c) $4n^3 + 4n^2 + n$

(d) None of the above

[Video Solution](#)

10. A G.P. consists of an even number of terms. If the sum of all the terms is 5 times the sum of the terms occupying odd places, the common ratio will be equal to

(a) 2 (b) 3 (c) 4 (d) 5

[Video Solution](#)

11. If S be the sum, P be the product and R be the sum of the reciprocals of n terms of a GP, then P^2 is equal to

(a) $\left(\frac{S}{R}\right)^n$ (b) S/R (c) $\left(\frac{R}{S}\right)^n$ (d) $\frac{R}{S}$

[Video Solution](#)

12. If the ratio of AM between two positive real numbers a and b to their HM is m:n, then a:b is equal to

(a) $\frac{\sqrt{(m-n)}+\sqrt{n}}{\sqrt{m-n}-\sqrt{n}}$ (b) $\frac{\sqrt{n}+\sqrt{m-n}}{\sqrt{n}-\sqrt{m-n}}$
(c) $\frac{\sqrt{m}+\sqrt{m-n}}{\sqrt{m}-\sqrt{m-n}}$ (d) $\frac{\sqrt{(m-n)}+\sqrt{m}}{\sqrt{m-n}-\sqrt{m}}$

[Video Solution](#)

13. The product of three geometric means between 4 and $1/4$ will be

(a) 4 (b) 2 (c) -1 (d) 1

[Video Solution](#)

14. If it is given that $\frac{1}{1^4} + \frac{1}{2^4} + \frac{1}{3^4} + \dots$ to $\infty = \frac{\pi^4}{90}$, then the value of $\frac{1}{1^4} + \frac{1}{3^4} + \frac{1}{5^4} + \dots$ to ∞ is equal to

(a) $\frac{\pi^4}{96}$ (b) $\frac{\pi^4}{45}$
(c) $\frac{89\pi^4}{90}$ (d) None of these

[Video Solution](#)

15. If a, b, c are in AP, $b - a$, $c - b$ and a are in GP, then a:b:c is

(a) 1:2:3 (b) 1:3:5
(c) 2:3:4 (d) 1:2:4

[Video Solution](#)

16. If the (p+q)th term of a geometric series is m and the (p-q)th term is n, then the pth term is

(a) $(mn)^{1/2}$ (b) mn
(c) m+n (d) m-n

[Video Solution](#)

17. If $\frac{1}{b-c}, \frac{1}{c-a}, \frac{1}{a-b}$ be consecutive terms of an AP, then $(b-c)^2, (c-a)^2, (a-b)^2$ will be in

(a) GP (b) AP
(c) HP (d) None of these

[Video Solution](#)

18. The sum to infinity of the series $1 + \frac{4}{5} + \frac{7}{5^2} + \frac{10}{5^3} + \dots$ is

(a) 16/35 (b) 11/8
(c) 35/16 (d) 8/6

[Video Solution](#)

19. Let a_1, a_2, \dots, a_{10} be in AP and h_1, h_2, \dots, h_{10} be in HP. If $a_1 = h_1 = 2$ and $a_{10} = h_{10} = 3$ then $a_4 h_7$ is

(a) 2 (b) 3
(c) 5 (d) 6

[Video Solution](#)

20. If $a, a_1, a_2, \dots, a_{2n}, b$ are in arithmetic progression and $a, g_1, g_2, \dots, g_{2n}, b$ are in geometric progression and h is the harmonic mean of a and b, then $\frac{a_1+a_{2n}}{g_1 g_{2n}} + \frac{a_2+a_{2n-1}}{g_2 g_{2n-1}} + \dots + \frac{a_n+a_{n+1}}{g_n g_{n+1}}$ is equal to

(a) 2nh (b) n/h
(c) nh (d) 2n/h

[Video Solution](#)

21. The sets $S_1, S_2, S_3 \dots$ are given by $S_1 = \left\{\frac{2}{1}\right\}, S_2 = \left\{\frac{3}{2}, \frac{5}{2}\right\}, S_3 = \left\{\frac{4}{3}, \frac{7}{3}, \frac{10}{3}\right\}, S_4 = \left\{\frac{5}{4}, \frac{9}{4}, \frac{13}{4}, \frac{17}{4}\right\}, \dots$ Then, the sum of the numbers in the set S_{25} is



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- (a) 320 (b) 322
(c) 324 (d) 326 [Video Solution](#)
22. If S_1, S_2, S_3 be the sum of $n, 2n, 3n$ terms respectively of an A.P., then
(a) $S_3 = S_1 + S_2$ (b) $S_3 = 2(S_1 + S_2)$
(c) $S_3 = 3(S_2 - S_1)$ (d) None of these [Video Solution](#)
23. If a, b, c be in arithmetic progression, then the value of $(a+2b-c)(2b+c-a)(a+2b+c)$ is
(a) $16abc$ (b) $4abc$
(c) $8abc$ (d) $3abc$ [Video Solution](#)
24. An infinite GP has first term x and sum 5, then x belongs to
(a) $x < -10$ (b) $-10 < x < 0$
(c) $0 < x < 10$ (d) $x > 10$ [Video Solution](#)
25. In a GP the sum of three numbers is 14, if 1 is added to first two numbers and subtracted from third number the series becomes AP, then the greatest number is
(a) 8 (b) 4
(c) 24 (d) 16 [Video Solution](#)
26. In the expression $(x+1)(x+4)(x+9)(x+16)\dots(x+400)$ the coefficient of x^{19} is:
(a) 2870 (b) 210
(c) 4001 (d) 1900 [Video Solution](#)
[NIMCET 2008]
27. Suppose a, b, c are in A.P. with common difference d . Then $e^{\frac{1}{c}}, e^{\frac{b}{ac}}, e^{\frac{1}{a}}$ are:
(a) A.P. (b) G.P.
(c) H.P. (d) None of these [Video Solution](#)
[NIMCET 2008]
28. The sum of the numbers from 1 to 100, which are not divisible by 3 and 5, is :
(a) 2946 (b) 2732
(c) 2632 (d) 2317 [Video Solution](#)
[NIMCET 2009]
29. If all the 6's are replaced by 9's, then the algebraic sum of all the numbers from 1 to 100 (both inclusive), varies by
(a) 330 (b) 333
(c) 219 (d) 279 [Video Solution](#)
[NIMCET 2009]



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Answer Key

Ques.	1	2	3	4	5	6	7	8	9	10
Ans.	C	B	D	A	A	B	B	B	A	C
Ques.	11	12	13	14	15	16	17	18	19	20
Ans.	A	C	D	A	A	A	B	C	D	D
Ques.	21	22	23	24	25	26	27	28	29	
Ans.	D	C	A	C	A	A	B	C	A	