



# Aspire Study MCA Entrance Classes

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## CTQ - 2023

**CTQ : Concept Through Questions**

**Year : 2023**

**Topic : Progression II**

1. If  $a, b, c$  are in A.P.,  $p, q, r$  are in H.P. and  $ap, bq, cr$  are in G.P., then  $\frac{p}{r} + \frac{r}{p}$  is equal to:

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

[Video Solution](#)

[NIMCET 2010]

2. Sum of 20 terms of the series  $-1^2 + 2^2 - 3^2 + 4^2 - \dots$  is

(a) 180 (b) 200  
(c) 210 (d) 220

[Video Solution](#)

[NIMCET 2013]

3. The value of  $9^{\frac{1}{3}} \cdot 9^{\frac{1}{9}} \cdot 9^{\frac{1}{27}} \dots \infty$  is

(a) 3 (b) 6  
(c) 9 (d) None of these

[Video Solution](#)

[NIMCET 2013]

4. The sum of  $n$  terms of an arithmetic series is 216. The value of the first term is  $n$  and the value of the  $n$ th term is  $2n$ . The common difference  $d$  is.

(a) 1 (b)  $\frac{2}{3}$   
(c)  $\frac{3}{2}$  (d)  $\frac{12}{11}$

[Video Solution](#)

[NIMCET 2013]

5. In a G.P. consisting of positive terms, each term equals the sum of the next two terms. Then the common ratio of the G.P. is

(a)  $\frac{1-\sqrt{5}}{2}$  (b)  $\frac{\sqrt{5}}{2}$   
(c)  $\sqrt{5}$  (d)  $\frac{\sqrt{5}-1}{2}$

[Video Solution](#)

[NIMCET 2013]

6. The value of the sum  $\frac{1}{2\sqrt{1}+1\sqrt{2}} + \frac{1}{3\sqrt{2}+2\sqrt{3}} + \frac{1}{4\sqrt{3}+3\sqrt{4}} + \dots + \frac{1}{25\sqrt{24}+24\sqrt{25}}$  is

(a)  $\frac{9}{10}$  (b)  $\frac{4}{5}$   
(c)  $\frac{14}{15}$  (d)  $\frac{7}{15}$

[Video Solution](#)

[NIMCET 2015]

7. If  $a_1, a_2, \dots, a_n$  are in A.P. and  $a_1 = 0$ , then the value of  $\left(\frac{a_3}{a_2} + \frac{a_4}{a_3} + \dots + \frac{a_n}{a_{n-1}}\right) - a_2 \left(\frac{1}{a_2} + \frac{1}{a_3} + \dots + \frac{1}{a_{n-2}}\right)$  is equal to

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

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[NIMCET 2016]

8. The sum of the expression  $\frac{1}{\sqrt{1}+\sqrt{2}} + \frac{1}{\sqrt{2}+\sqrt{3}} + \frac{1}{\sqrt{3}+\sqrt{4}} + \dots + \frac{1}{\sqrt{80}+\sqrt{81}}$  is

- (a) 7 (b) 8  
(c) 9 (d) 10

[Video Solution](#)

[NIMCET 2016]

9. Three positive number whose sum is 21 are in arithmetic progression. If 2, 2, 14 are added to them respectively then resulting numbers are in geometric progression. Then which of the following is not among the three numbers?

- (a) 25 (b) 13  
(c) 1 (d) 7

[Video Solution](#)

[NIMCET 2017]

10. The harmonic mean of two numbers is 4. Their arithmetic mean A and the geometric mean G satisfy the relation  $2A + G^2 = 27$ , then the two numbers are

- (a) 4 and 2 (b) 6 and 3  
(c) 5 and 7 (d) 4 and 1

[Video Solution](#)

[NIMCET 2017]

11. If  $\log_3 2, \log_3(2^x - 5), \log_3\left(2^x - \frac{7}{2}\right)$  are in arithmetic progression, then the value of x is equal to

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

[Video Solution](#)

[NIMCET 2018]

12. If  $a_1, a_2, a_3, \dots, a_n$  are positive real numbers whose product is a fixed number c, then the minimum value of  $a_1 + a_2 + \dots + 2a_n$  is

- (a)  $n(2c)^{\frac{1}{n}}$  (b)  $(n+1)c^{\frac{1}{n}}$   
(c)  $2nc^{\frac{1}{n}}$  (d)  $((n+1)(2c)^{\frac{1}{n}})$

[Video Solution](#)

[NIMCET 2018]

13. Suppose that m and n are fixed numbers such that the  $m^{th}$  term of an HP is equal to n and the  $n^{th}$  term is equal to m ( $m \neq n$ ), then the  $(m+n)^{th}$  term is

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

[Video Solution](#)

[NIMCET 2018]

14. Sum to infinity of a geometric is twice the sum of first two terms. Then what are the possible values of common ratio?

- (a)  $\pm \frac{1}{\sqrt{2}}$  (b)  $\pm 1/2$   
(c)  $\pm 1/\sqrt{3}$  (d)  $\pm 1/3$

[Video Solution](#)

[NIMCET 2018]

15. The sum of infinite terms of a decreasing GP is equal to the greatest value of the function

$f(x) = x^3 + 3x - 9$  in the interval  $[-2, 3]$  and the difference between the first two terms is  $f'(0)$ . Then the common ratio of GP is

- (a) -2/3 (b) 4/3



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(c)  $2/3$

(d)  $-4/3$

[Video Solution](#)

[NIMCET 2019]

16. If  $x, 2x+2, 3x+3$  are the first three terms of a geometric progression, then  $4^{th}$  term in the geometric progression is

(a)  $-13.5$

(b)  $13.5$

(c)  $-27$

(d)  $27$

[Video Solution](#)

[NIMCET 2019]

17. If  $a, b, c$  are in GP and  $\log a - \log 2b, \log 2b - \log 3c$  and  $\log 3c - \log a$  are in AP, then  $a, b, c$  are the lengths of the sides of a triangle which is

(a) Acute angle

(b) Obtuse angled

(c) Right angles

(d) Equilateral

[Video Solution](#)

[NIMCET 2019]

18. If  $a, a_1, a_2, a_3, \dots, a_{2n-1}, b$  are in AP,  $a, b_1, b_2, \dots, b_{2n-1}, b$  are in GP and  $a, c_1, c_2, c_3, \dots, c_{2n-1}, b$  are in HP, where  $a, b$  are positive, then the equation  $a_n x^2 - b_n x + c_n = 0$  has its roots

(a) Real and equal

(b) Real and unequal

(c) Imaginary

(d) One real and one imaginary

[Video Solution](#)

[NIMCET 2019]

19. An arithmetic progression has 3 as its first term. Also, the sum of the first 8 terms is twice the sum of the first 5 terms. Then what is the common difference?

(a)  $3/4$

(b)  $1/2$

(c)  $1/4$

(d)  $4/3$

[Video Solution](#)

[NIMCET 2020]

20. Three cities A, B, C are equidistant from each other. A motorist travels from A to B at 30km/hour, from B to C at 40km/hour and from C to A at 50km/hour. Then the average speed is

(a) 39km/hour

(b) 40km/hour

(c) 38.3km/hour

(d) 37.6km/hour

[Video Solution](#)

[NIMCET 2020]

21. The four geometric means between 2 and 64 are

(a)  $\frac{1}{4}, \frac{1}{8}, \frac{1}{16}, \frac{1}{32}$

(b) 4, 8, 16, 32

(c)  $4\sqrt{2}, 8, 16\sqrt{2}, 32$

(d) None of the above

[Video Solution](#)

[NIMCET 2021]

22. If  $H_1, H_2, \dots, H_n$  are  $n$  harmonic means between  $a$  and  $b$  ( $a \neq b$ ), then  $\frac{H_1+a}{H_1-a} + \frac{H_n+b}{H_n-b} =$

(a)  $2n$

(b)  $n+1$

(c)  $n-1$

(d)  $2n+1$

[Video Solution](#)

[NIMCET 2021, NIMCET 2008]

23. In a Harmonic Progression,  $p^{th}$  term is  $q$  and  $q^{th}$  term is  $p$ . Then  $pq^{th}$  term is

(a) 0

(b) 1

(c)  $pq$

(d)  $pq(p+q)$

[Video Solution](#)

[NIMCET 2022]



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24. If  $a_1, a_2, \dots, a_n$  are in AP with common difference  $d$ , then the sum  $(\sin d)(\operatorname{cosec} a_1 \cdot \operatorname{cosec} a_2 + \operatorname{cosec} a_2 \cdot \operatorname{cosec} a_3 + \dots + \operatorname{cosec} a_{n-1} \cdot \operatorname{cosec} a_n)$  is equal to  
(a)  $\cot a_1 - \cot a_n$  (b)  $\sin a_1 - \sin a_n$   
(c)  $\operatorname{cosec} a_1 - \operatorname{cosec} a_n$  (d)  $a_1 - a_n$  Video Solution [NIMCET 2022]
25. If  $\alpha, \beta$  are the roots of  $x^2 - x - 1 = 0$  and  $A_n = \alpha^n + \beta^n$ , then Arithmetic mean of  $A_{n-1}$  and  $A_n$  is  
(a)  $2A_{n-1}$  (b)  $\frac{1}{2} A_{n+1}$   
(c)  $2A_{n-2}$  (d) None of these Video Solution [NIMCET 2022]
26. Which term of the series  $\frac{\sqrt{5}}{3}, \frac{\sqrt{5}}{4}, \frac{1}{\sqrt{5}}, \dots$  is  $\frac{\sqrt{5}}{13}$ ?  
(a) 12 (b) 11  
(c) 10 (d) 9 Video Solution [NIMCET 2022]





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## Answer Key

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