



# 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)  $\frac{b}{q} - \frac{a}{p}$       (d)  $\frac{b}{q} + \frac{a}{p}$ 
[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) 2/3  
 (c) 3/2      (d) 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) 9/10      (b) 4/5  
 (c) 14/15      (d) 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)  $n - \frac{1}{n-2}$ 
[Video Solution](#)



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[NIMCET 2016]



## Video Solution

[NIMCET 2016]



## Video Solution

[NIMCET 2017]



## Video Solution

[NIMCET 2017]



## 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](#)

## 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](#)

## 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)  $\pm1/2$   
(c)  $\pm1/\sqrt{3}$       (d)  $\pm1/3$

[Video Solution](#)

## Video Solution

[NIMCET 2018]



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(c) 2/3

(d) -4/3

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[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  $b$  ( $\neq a$ ), 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

(sind)(cosec  $a_1$  . cosec  $a_2$  + cosec  $a_2$  . cosec  $a_3$  + ... + cosec  $a_{n-1}$  . 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				