

## Chapter 6 - Sequence and Series

### Arithmetic Progression AP

#### Past Year Questions

PYQ May 18

- (1) A person pays ₹ 975 in monthly instalments, each instalment is less than formed by ₹ 5. The amount of 1<sup>st</sup> instalment is ₹ 100. In what time will the entire amount be paid?
- a. 26 months      b. 15 months  
c. Both (a) & (b)      d. 18 months

PYQ May 18

- (2) If the sum of  $n$  terms of an AP is  $(3n^2 - n)$  and its common difference is 6, then its 1<sup>st</sup> term is:
- a. 3      b. 2  
c. 4      d. 1

PYQ May 18

- (3) Insert two arithmetic means between 68 and 260.
- a. 132, 196      b. 130, 194  
c. 70, 258      d. None of these

PYQ Nov 18

- (4) If the  $p^{\text{th}}$  term of an A.P. is 'q' and the  $q^{\text{th}}$  term is 'p', then its  $r^{\text{th}}$  term is
- a.  $p + q - r$       b.  $p + q + r$   
c.  $p - q - r$       d.  $p - q$

PYQ Nov 18

- (5) The sum of the series  $-8, -6, -4, \dots, n$  terms is 52. The number of terms  $n$  is
- a. 11      b. 12  
c. 13      d. 10

PYQ Nov 18

- (6) The value of  $K$ , for which the terms  $7K + 3, 4K - 5, 2K + 10$  are in A.P., is
- a. 13      b. -13  
c. 23      d. -23

PYQ June 19

- (7) If the ratio of sum of  $n$  terms of two APs is  $(n + 1) : (n - 1)$ , then the ratio of their  $m^{\text{th}}$  terms
- a.  $(m + 1) : 2m$   
b.  $(m + 1) : (m - 1)$   
c.  $(2m - 1) : (m + 1)$   
d.  $m : (m - 1)$

Note: Extra Lengthy Solution.

PYQ June 19

- (8) If  $2 + 6 + 10 + 14 + 18 + \dots + x = 882$   
★ then the value of  $x$
- a. 78      b. 80  
c. 82      d. 86

PYQ Nov. 19

- (9) If the sum of five terms of AP is 75. Find the third term of the series
- a. 35      b. 30  
c. 15      d. 20

PYQ Nov. 20

- (10) The 20<sup>th</sup> term of arithmetic progression whose 6<sup>th</sup> term is 38 and 10<sup>th</sup> term is 66 is:
- a. 118      b. 136  
c. 178      d. 210

PYQ Nov. 20

- (11) Divide 69 into 3 parts which are in A.P. and are such that the product of first two parts is 460:
- a. 20, 23, 26      b. 21, 23, 25  
c. 19, 23, 27      d. 22, 23, 24

PYQ July 21

- (12) The number of terms of the series:  $5 + 7 + 9 + \dots$  must be taken so that the sum may be 480.
- a. 20      b. 10  
c. 15      d. 25

PYQ July 21

- (13) If the sum of ' $n$ ' terms of an AP (Arithmetic Progression) is  $2n^2$ , the fifth term is
- ★
- a. 20      b. 50  
c. 18      d. 25

PYQ Dec. 21

- (14) The sum of first  $n$  terms an AP is  $3n^2 + 5n$ . The series is:
- a. 8, 14, 20, 26, ...      b. 8, 22, 42, 68, ..  
c. 22, 68, 114, ...      d. 8, 14, 28, 44, ..

PYQ June 22

- (15) The  $n^{\text{th}}$  term of the series 9, 7, 5, ... and  
★ 15, 12, 9, ... are same. Find the  $n^{\text{th}}$  term?
- a. 7      b. 8  
c. 9      d. 10

PYQ May 18, PYQ June 22

- (16) A person pays ₹ 975 in monthly installments, each installment is less than former by ₹ 5. The amount of 1<sup>st</sup> installment is ₹ 100. In what time will the entire amount be paid?
- a. 26 months      b. 15 months  
c. Both (a) & (b)      d. 18 months

PYQ Dec 22

- (17) If  $p^{\text{th}}$  term of an AP is  $q$  and its  $q^{\text{th}}$  term is  $p$ , then what will be the value of  $(p+q)^{\text{th}}$  term?  
 ☆  
 a. 0                      b. 1  
 c.  $p+q-1$             d.  $2(p+q-1)$

PYQ Jun 23

- (18) How many numbers between 74 and 25,556 are divisible by 5?  
 a. 5090                    b. 5097  
 c. 5095                    d. 5075

PYQ Jun 23

- (19) If  $9^{\text{th}}$  and  $19^{\text{th}}$  term of an AP are 35 and 75, respectively, then its  $20^{\text{th}}$  term is:  
 a. 78                      b. 79  
 c. 80                      d. 81

PYQ Dec 23

- (20) Find the  $17^{\text{th}}$  term of an AP series if  $15^{\text{th}}$  and  $21^{\text{st}}$  terms are 30.5 and 39.5 respectively.  
 a. 33.5                    b. 35.5  
 c. 36.0                    d. 38.0

PYQ Dec 23

- (21) If  $n^{\text{th}}$  term of an AP series is  $7n-2$ , then sum of ' $n$ ' terms is:  
 ☆  
 a.  $0.5(7n^2+2n)$       b.  $0.5(7n^2-3n)$   
 c.  $0.5(7n^2+3n)$       d.  $0.5(7n^2-2n)$

PYQ Dec 23

- (22) Find the value of ' $x$ ' for the following data  
 ☆  
 $1+7+13+19+\dots+x=225$   
 a. 56                      b. 63  
 c. 49                      d. 42

PYQ June 24

- (23) In an arithmetic progression, the seventh terms is  $x$ , and  $(x+7)^{\text{th}}$  term is zero. Then  $x^{\text{th}}$  term is  
 ☆  
 a. 6                        b. 7  
 c. 8                        d. 10

PYQ June 24

- (24) If the second and eight terms of an arithmetic progression (AP) are equal to constant  $a$ , then the sum of first  $n$  terms of this AP is equal to  
 ☆  
 a.  $na$                       b.  $a/n$   
 c.  $2n+n(a-1)$         d.  $n+a(n-1)$

PYQ June 24

- (25) The  $3^{\text{rd}}$  term of arithmetic progression is 7 and Seventh term is 2 more than thrice of third term. The common difference is  
 a. 4                        b. 3  
 c. 5                        d. 6

PYQ Sep 23

- (26) If fourth term of A.P. series is zero, then the ratio of twenty-fifth term of eleventh term?  
 a. 4                        b. 5  
 c. 3                        d. 2

Answer Key

1 b	2 b	3 a
4 a	5 c	6 d
7 d	8 c	9 c
10 b	11 a	12 a
13 c	14 a	15 a
16 b	17 a	18 b
19 b	20 a	21 c
22 c	23 b	24 a
25 a	26 c	

Arithmetic Progression AP

Mock Test Paper Questions

MTP May 18

- (1) If 8th term of an AP is 15, the Sum of the 15 its term is  
 a. 15                      b. 0  
 c. 225                    d.  $225/2$

MTP May 18

- (2) For what value of  $x$ ; the sequence  $x+1, 3x, 4x+2$  are in AP?  
 a. 3                        b. 2  
 c. 4                        d. 5

MTP Nov 18

- (3) The  $n^{\text{th}}$  element of the series  $1, 3, 5, 7, \dots$  is  
 a. 2                        b.  $2n-1$   
 c.  $2n+1$                 d. none of these

MTP Nov 18

- (4) If  $\frac{1+3+5+\dots+n\text{terms}}{2+4+6+\dots+50\text{terms}} = \frac{2}{51}$ , then the value of ' $n$ '  
 a. 9                        b. 10  
 c. 12                      d. 13

MTP Nov 18

- (5) If 6th and 13th term of an A.P are 15 and 36 respectively the A.P is  
 a. 2, 5, 8, 11          b. 1, 4, 6, 8  
 c. -4, -1, 2, 5        d. 0, 3, 6, 9

- (6) The value of  $K$ , for which the terms  $7K+3$ ,  $4K-5$ ,  $2K+10$  are in A.P., is
- a. 13                      b. -23  
c. 13                        d. 23

## MTP May 19 Series II

- (7) Which term of the AP 64, 60, 56, 52, ... is 0
- a. 16                        b. 17  
c. 15                        d. 14

## MTP Nov 19

- (8) The first term of an A.P. is 100 and the sum of whose first 6 terms is 5 times the sum of the next 6 terms, then the c.d. is -
- ☆ a. -10                      b. 10  
c. 5                         d. none of these

## MTP Nov 19

- (9) The sum of  $n$  terms of an A.P. is  $3n^2 + n$ ; then its  $p^{\text{th}}$  term is
- a.  $6p+2$                       b.  $6p-2$   
c.  $6p-1$                       d. none of these

## MTP Nov 19

- (10) If three AM's between 3 and 11, they are
- a. 4, 6, 8  
b. 3, 5, 7  
c. 5, 7, 9  
d.  $11/2, 15/2, 19/2$

## MTP May 20

- (11) The first and the last term of an AP are -4 and 146. The sum of the terms is 7171. The number of terms is
- a. 101                        b. 100  
c. 99                         d. none of these

## MTP March 21

- (12) If the sum of  $n$  terms of an A.P. is  $3n^2 - n$  and its common difference is 6, then its third term is:
- a. 10                        b. 12  
c. 14                        d. 16

## MTP March 21

- (13) Insert 4 A.M.'s between 3 and 18:
- a. 12, 15, 9, 6                      b. 6, 9, 12, 15  
c. 9, 6, 12, 15                      d. 15, 12, 9, 6

## MTP Nov 21

- (14) The sum of the first 3 terms in an AP is 18 and that of the last 3 is 28. If the AP has 13 terms, find sum of the middle three terms?
- ☆ a. 23                        b. 18  
c. 19                        d. none of these

## PYQ Jul 21, MTP Nov 21

- (15) If the sum of  $n$  terms of an AP is  $2n^2$ , then 5<sup>th</sup> term is
- a. 20                        b. 50  
c. 18                        d. 25

## MTP Nov 21

- (16) The ratio of sum of first  $n$  natural numbers to sum of cubes of first  $n$  natural numbers is
- a. 3:16                        b.  $n(n+1)/2$   
c.  $2/n(n+1)$                       d. None of these

## MTP Nov 19

- (17) Sum of progression  $(a+b)$ ,  $a$ ,  $(a-b)$ , ...  $n$  term is
- a.  $\frac{n}{2}[2a+(n-1)b]$   
b.  $\frac{n}{2}[2a+(3-n)b]$   
c.  $\frac{n}{2}[2a+(3-n)]$   
d.  $\frac{n}{2}[2a+(n-1)]$

## MTP Oct 21

- (18) Find the sum of first twenty-five terms of A.P. series whose  $n^{\text{th}}$  term is  $\left(\frac{n}{5} + 2\right)$
- a. 105                        b. 115  
c. 125                        d. 135

## MTP June 22

- (19) The first and fifth term of an A.P. of 40 terms are -29 and -15 respectively. Find the sum of all positive terms of this A.P.
- a. 1605                        b. 1705  
c. 1805                        d. none of these

## MTP June 22

- (20) If the common difference of an AP equals to the first term, then the ratio of its  $m^{\text{th}}$  term and  $n^{\text{th}}$  term is:
- a.  $n:m$                         b.  $m:n$   
c.  $m^2:n^2$                       d. none of these

## MTP June 22

- (21) Find the value of  $1 + 2 + 3 + \dots + 105$
- a. 5000                        b. 5560  
c. 5565                        d. None of these

## MTP Dec 22 - Series I

- (22) The first and last terms of an arithmetic progression are 5 and 905. Sum of the terms is 45,955. The number of terms is
- a. 99                        b. 100  
c. 101                        d. 102

## MTP Dec 22 – Series I/ MTP Sep 24 – I

- (23) If the sum of  $n$  terms of an AP is  $3n^2 - n$  and its common difference is 6, then its 1<sup>st</sup> term is
- |      |      |
|------|------|
| a. 3 | b. 2 |
| c. 4 | d. 1 |

## MTP Dec 22 Series II

- (24) Sum lying from 100 to 300 which is divisible by 4 and 5 is
- |         |         |
|---------|---------|
| a. 2000 | b. 2100 |
| c. 2200 | d. 2300 |

## MTP Dec 22 Series II

- (25) Sum of  $x$  terms of two AP's are in the ratio  $\star$   $(3x+5):(5x+3)$  then ratio of their 10<sup>th</sup> term
- |            |                  |
|------------|------------------|
| a. 31 : 49 | b. 30 : 49       |
| c. 28 : 49 | d. None of these |

## MTP June 2023 Series I

- (26) In AP  $T_p = q$  and  $T_q = p$  then  $T_{p+q} =$  \_\_\_\_\_
- $\star$
- |                    |             |
|--------------------|-------------|
| a. 0               | b. $-(p+q)$ |
| c. $\frac{p+q}{2}$ | d. 1        |

## MTP June 2023 Series II

- (27) If 20 A.M.s. are inserted between 3 and 51 then sum of these 20 A.M.s is
- |        |                  |
|--------|------------------|
| a. 540 | b. 1080          |
| c. 270 | d. None of these |

## MTP June 2023 Series II

- (28) The 4<sup>th</sup> term of an A.P. is three times the first and the 7<sup>th</sup> term exceeds twice the third term by 1. Find the first term 'a' and common difference 'd'.
- $\star$
- |               |               |
|---------------|---------------|
| a. $a=3, d=2$ | b. $a=4, d=3$ |
| c. $a=5, d=4$ | d. $a=6, d=5$ |

## MTP Dec 2023 Series I

- (29) A person pays Rs. 975 in monthly instalments, each instalment is less than former by Rs. 5. The amount of first instalment is Rs. 100. In what time will the entire amount be paid?
- $\star$
- |                 |              |
|-----------------|--------------|
| a. 26 months    | b. 15 months |
| c. Both (a),(b) | d. 18 months |

## MTP Dec 2023 Series I

- (30) If the sum of  $n$  terms of an A.P. is  $(3n^2 - n)$  and its common difference is 6, then its first term is:
- |      |      |
|------|------|
| a. 3 | b. 2 |
| c. 4 | d. 1 |

## MTP Dec 2023 Series I

- (31) Insert 4 A.M.'s between 3 and 18:
- |                 |                 |
|-----------------|-----------------|
| a. 12, 15, 9, 6 | b. 6, 9, 12, 15 |
| c. 9, 6, 12, 15 | d. 15, 12, 9, 6 |

## MTP Dec 2023 Series I

- (32) A man starts his job with a certain monthly salary and earns a fixed increment every year. If his salary was ₹ 1,500 after 4 years of service and ₹ 1,800 after 10 years of service, what was his starting salary and what is the annual increment in rupees?
- |                  |                  |
|------------------|------------------|
| a. ₹ 1,300, ₹ 50 | b. ₹ 1,100, ₹ 50 |
| c. ₹ 1,500, ₹ 30 | d. None of these |

## MTP June 24 Series I

- (33) If the  $p^{\text{th}}$  term of an A.P. is 'q' and the  $q^{\text{th}}$  term is 'p', then its  $r^{\text{th}}$  term is:
- |            |            |
|------------|------------|
| a. $p+q+r$ | b. $p+q-r$ |
| c. $p-q-r$ | d. $p+q$   |

## MTP June 24 Series I

- (34) If the sum of  $n$  terms of an A.P. be  $2n^2 + 5n$  then its ' $n$ ' term is:
- |           |           |
|-----------|-----------|
| a. $4n-2$ | b. $3n-4$ |
| c. $4n+3$ | d. $3n+4$ |

## MTP June 24 Series I

- (35) The first, second and seventh term of an A.P. are in G.P. and the common difference is 2, the 2<sup>nd</sup> term of A.P. is :
- |          |          |
|----------|----------|
| a. $5/2$ | b. 2     |
| c. $3/2$ | d. $1/2$ |

## MTP June 24 Series I

- (36) Find the sum of all natural numbers between 250 and 1,000 which are exactly divisible by 3:
- |             |             |
|-------------|-------------|
| a. 1,56,375 | b. 1,56,357 |
| c. 1,65,375 | d. 1,65,357 |

## MTP June 24 Series I

- (37) A man starts his job with a certain monthly salary and earns a fixed increment every year. If his salary was ₹ 1,500 after 4 years of service and ₹ 1,800 after 10 years of service, what was his starting salary and what is the annual increment in rupees?
- |                  |                  |
|------------------|------------------|
| a. ₹ 1,300, ₹ 50 | b. ₹ 1,100, ₹ 50 |
| c. ₹ 1,500, ₹ 30 | d. None of these |

## MTP June 24 Series I

- (38) If  $(x+1)$ ,  $3x(4x+2)$  are in A.P. Find the value of  $x$
- |      |      |
|------|------|
| a. 2 | b. 3 |
| c. 4 | d. 5 |

- MTP June 24 Series II**
- (39) Divide 144 into three parts which are in AP and such that the largest is twice the smallest, the smallest of three numbers will be:
- a. 48                      b. 36  
c. 13                        d. 32

- MTP June 24 Series III**
- (40) If 8<sup>th</sup> term of an AP is 15, the sum of the 15 terms is
- a. 15                        b. 0  
c. 225                      d. 225/2

- MTP June 24 Series III**
- (41) For what value of  $x$ ; the sequence  $x+1, 3x, 4x+2$  are in AP?
- a. 3                         b. 2  
c. 4                         d. 5

- MTP Sep 24 Series II**
- (42) The  $n^{\text{th}}$  term of the series whose sum to  $n$  terms is  $3n^2 + 2n$  is:
- a.  $3n-1$                       b.  $8n-2$   
c.  $11n-3$                      d.  $6n-1$

**Answer Key**

1 c	2 a	3 b
4 b	5 d	6 b
7 b	8 a	9 b
10 c	11 a	12 c
13 b	14 a	15 c
16 c	17 b	18 b
19 b	20 b	21 c
22 c	23 b	24 c
25 a	26 a	27 a
28 a	29 b	30 b
31 b	32 a	33 b
34 c	35 a	36 a
37 a	38 b	39 d
40 c	41 a	42 d

**Geometric Progression**

**Past Year Questions**

- PYQ Nov. 18**
- (1) The 3<sup>rd</sup> term of a G.P. is  $2/3$  and the 6<sup>th</sup> term is  $2/81$  then the 1<sup>st</sup> term is
- a. 6                         b.  $1/3$   
c. 9                         d. 2

- PYQ June 19**
- (2) In a G.P. if the fourth term is '3' then the product of first seven terms is
- a.  $3^5$                         b.  $3^7$   
c.  $3^6$                         d.  $3^8$

- PYQ June 19**
- (3) If  $y = 1 + x + x^2 + \dots + \infty$  then  $x =$
- a.  $\frac{y-1}{y}$                         b.  $\frac{y+1}{y}$   
c.  $\frac{y}{y+1}$                       d.  $\frac{y}{y-1}$

- PYQ Nov. 19**
- (4) Sum up to infinity of series.
- ★  $\frac{1}{2} + \frac{1}{3^2} + \frac{1}{2^2} + \frac{1}{3^4} + \frac{1}{2^4} + \dots$
- a.  $19/24$                       b.  $24/19$   
c.  $5/24$                         d. None of these

- PYQ Nov. 19**
- (5) Sum the series  $\frac{1}{5}, \frac{1}{5^2}, \frac{1}{5^3}, \dots, \frac{1}{5^n}$ .
- a.  $\frac{1}{4} \left[ 1 - \left( \frac{1}{5} \right)^n \right]$                       b.  $\frac{1}{5} \left[ 1 - \left( \frac{1}{4} \right)^n \right]$   
c. Both (a) & (b)                      d. None of these

- PYQ Nov. 19**
- (6) Find no. of terms of the series 25, 5, 1, ...  $\frac{1}{3125}$
- a. 6                         b. 7  
c. 8                         d. 9

- PYQ Nov. 20**
- (7) Three numbers in G.P. with their sum 130 and their product 27,000 are:
- a. 10, 30, 90                      b. 90, 30, 10  
c. Both (a) & (b)                      d. 10, 20, 30

- PYQ Jan. 21**
- (8) In a geometric progression that 3<sup>rd</sup> and 6<sup>th</sup> terms are respectively 1 and  $-1/8$ . The term (a) and common ratio are respectively.
- a. 4 and  $\frac{1}{2}$                       b. 4 and  $\frac{-1}{4}$   
c. 4 and  $\frac{-1}{2}$                       d. 4 and  $\frac{1}{4}$

- PYQ Dec. 21**
- (9) If the sum and product of three numbers in G.P. are 7 and 8 respectively, then 4<sup>th</sup> term of the series is
- ★ a. 6                         b. 4  
c. 8                         d. 16

- (10) The sum of series  $7 + 14 + 21 + \dots$  to  $17^{\text{th}}$  term is:  
 a. 1071                      b. 971  
 c. 1171                      d. 1271

- (11) The largest value of  $n$  for which  
 $\star \frac{1}{2} + \frac{1}{2^2} + \dots + \frac{1}{2^n} < 0.998$  is  
 a. 9                              b. 6  
 c. 7                              d. 8

- (12) The sum of first 8 terms of a G.P is five times the sum of the first 4 terms. Find the common ratio?  
 a.  $\pm\sqrt{2}$                       b. 16  
 c.  $\pm\sqrt{20}$                       d. 4

- (13) In a GP  $5^{\text{th}}$  term is 27 and  $8^{\text{th}}$  term is 729. Find its  $11^{\text{th}}$  term?  
 a. 729                              b. 6561  
 c. 2187                              d. 19683

- (14) If  $4^{\text{th}}, 7^{\text{th}}$  and  $10^{\text{th}}$  terms of a Geometric Progression are  $p, q$  and  $r$ , respectively, then:  
 a.  $p^2 = q^2 + r^2$               b.  $p^2 = qr$   
 c.  $q^2 = pr$                       d.  $pqr + pq + 1 = 0$

- (15) Given an infinite geometric series with first term ' $a$ ' and common ratio ' $r$ '. If its sum is 4 and the second term is  $\frac{3}{4}$ , then one of correct option is  
 a.  $a=1$  and  $r = \frac{1}{4}$   
 b.  $a=3$  and  $r = \frac{3}{4}$   
 c.  $a=3$  and  $r = \frac{1}{4}$   
 d.  $a=1$  and  $r = \frac{1}{2}$

- (16) A roadside tea stall merchant borrows ₹ 9,000 at 2.76% Simple Interest per annum. The principal and the interest are to be paid in 10 monthly instalments. If each instalment is double than the preceding one, find the value of the last instalment.

- a. 4,608                              b. 1,024  
 c. 9,207                              d. 4,096

- (17) If for an infinite geometric progression, first term is ' $a$ ', common ratio is ' $r$ ', the sum is  $\frac{7}{8}$  and the second term is  $\frac{7}{8}$ , then

- a.  $a=4$  &  $r = \frac{7}{16}$               b.  $a=3$  &  $r = \frac{7}{24}$   
 c.  $a=7$  &  $r = \frac{1}{8}$                       d.  $a=2$  &  $r = \frac{7}{32}$

Answer Key

- |      |      |      |
|------|------|------|
| 1 a  | 2 b  | 3 a  |
| 4 a  | 5 a  | 6 c  |
| 7 c  | 8 c  | 9 c  |
| 10 a | 11 d | 12 a |
| 13 d | 14 c | 15 c |
| 16 a | 17 c |      |

Geometric Progression

Mock Test Paper Questions

- (1) For what values of  $x$ , the number  $\frac{-2}{7}, x, \frac{-7}{2}$  are in G.P.?  
 a.  $\pm 1$                               b.  $\pm 3$   
 c.  $\pm 2$                               d. None

- (2) Find the three numbers in G.P, whose sum is 19 and product is 216.  
 a. 9,6,4 or 4,6,9              b. 9,6,3 or 3,6,9  
 c. 9,3,1 or 1,3,9              d. 9,3, -1 or -1,3,9

- (3) The  $n^{\text{th}}$  term of the sequence -1,2, -4, 8, is  
 a.  $(-1)^n 2^{n-1}$                   b.  $2^{n-1}$   
 c.  $2^n$                                   d. None of these

- (4) The sum of the first two terms of a GP is  $\frac{5}{3}$  and the sum of infinity of the series is 3. The common ratio is  
 a.  $\frac{1}{3}$                                   b.  $\frac{2}{3}$   
 c.  $-\frac{1}{3}$                                   d.  $\pm \frac{2}{3}$

## MTP May 19 Series II

- (5) The sum of the infinite series  $1 + 2/3 + 4/9 + \dots$  is
- a.  $1/3$                       b.  $3$   
c.  $2/3$                       d. None of these

## MTP March 2021

- (6) Find the sum to  $n$  terms of the series :  $7+77+777+\dots$  to  $n$  terms:
- a.  $\frac{7}{9}(10^{n+1}-10) - \frac{7n}{9}$   
b.  $\frac{7}{9}(10^{n+1}-10) + \frac{7n}{9}$   
c.  $\frac{7}{81}(10^{n+1}-10) - \frac{7n}{9}$   
d.  $\frac{7}{81}(10^{n+1}-10) + \frac{7n}{9}$

## MTP Apr 21

- (7) Given:  $P(7, k) = 60 P(7, k-3)$ . Then:
- a.  $K=9$                       b.  $K=8$   
c.  $K=5$                       d.  $K=0$

Note: From Chp5 PNC

## MTP Apr 21

- (8) If the  $p^{\text{th}}$  term of a G.P. is  $x$  and the  $q^{\text{th}}$  term is  $y$ , then find the  $n^{\text{th}}$  term:
- a.  $\left[ \frac{x^{(n-q)}}{y^{(n-p)}} \right]$                       b.  $\left[ \frac{x^{(n-q)}}{y^{(n-p)}} \right]^{(p-q)}$   
c.  $1$                                       d.  $\left[ \frac{x^{(n-q)}}{y^{(n-p)}} \right]^{\frac{1}{p-q}}$

Note: Extra Lengthy Solution.

## MTP Apr 21

- (9) The sum of the series:  $0.5+0.55+0.555+\dots$  to  $n$  term is:
- a.  $\frac{5n}{9} + \frac{5}{9}[1-(0.1)^n]$   
b.  $\frac{5n}{9} - \frac{5}{81}[1-(0.1)^n]$   
c.  $\frac{5n}{9} + \frac{5}{81}[1-(0.1)^n]$   
d. None

## MTP Oct 21

- (10) The second term of a G.P. is 24 and the fifth term is 81. The series is
- a.  $16, 36, 24, 54, \dots$   
b.  $24, 36, 53, \dots$   
c.  $16, 24, 36, 54, \dots$   
d. none of these

## MTP Oct 21

- (11) The series  $1+10^{-1}+10^{-2}+10^{-3}+\dots$  to  $\infty$  is
- a.  $9/10$                       b.  $1/10$   
c.  $10/9$                       d. none of these

## MTP March 22

- (12) In a G.P. if fourth term is 3 then the product of first seven terms is
- a.  $3^5$                                       b.  $3^7$   
c.  $3^6$                                       d.  $3^8$

## PYQ Nov 18, MTP March 22

- (13) In a G.P. If the third term of a GP is  $2/3$  and 6<sup>th</sup> term is  $2/81$ , then the first term is
- a.  $6$                                       b.  $1/3$   
c.  $9$                                       d.  $2$

## PYQ Nov 19, MTP March 22

- (14) Sum upto infinity series
- ★  $\frac{1}{2} + \frac{1}{3^2} + \frac{1}{2^3} + \frac{1}{3^4} + \frac{1}{2^5} + \dots$
- a.  $19/24$                                       b.  $24/19$   
c.  $5/24$                                       d. none of these

## MTP June 22

- (15) In a G.P sixth term is 729 and the common ratio is 3, then the first term of G.P. is
- a.  $2$                                       b.  $3$   
c.  $4$                                       d.  $7$

## MTP Dec 22 - Series I

- (16) In a geometric progression, the second term is 12 and sixth term is 192. Find 11<sup>th</sup> term.
- a.  $3072$                                       b.  $1536$   
c.  $12288$                                       d.  $6144$

## PYQ Jun 22, MTP Dec 22 - Series I

- (17) The sum of first eight terms of geometric progression is five times the sum of the first four terms. The common ratio is
- a.  $\sqrt{3}$                                       b.  $\sqrt{2}$   
c.  $4$                                       d.  $2$

## MTP Dec 22 Series II

- (18) If 5<sup>th</sup> term of G.P. is 32 and 3<sup>rd</sup> term of G.P. is 8 then 6<sup>th</sup> term of G.P. is
- a.  $4$                                       b.  $16$   
c.  $32$                                       d.  $64$

## MTP Dec 22 Series II

- (19) Which term of the sequence  $2, 4, 8, 16, \dots$  is 2048?
- a.  $9$                                       b.  $10$   
c.  $11$                                       d. None of these

MTP June 2023 Series I

- (20) The 5<sup>th</sup> and 8<sup>th</sup> terms of a GP series is 27 and 729. Then find the 10<sup>th</sup> term.  
 a. 729                      b. 243  
 c. 81683                    d. 6561

MTP June 2023 Series I

- (21) Four Geometric Means between 4 and 972 are  
 a. 12, 30, 100, 324  
 b. 12, 24, 108, 320  
 c. 10, 36, 108, 320  
 d. 12, 36, 108, 324

MTP June 2023 Series II

- (22) The sum up to infinity of the series  $S = \frac{1}{2} + \frac{1}{6} + \frac{1}{18} + \dots$  is  
 a.  $\frac{5}{4}$   
 b.  $\frac{3}{4}$   
 c.  $\frac{7}{3}$   
 d. None of these

MTP Dec 2023 Series I / MTP Sep 24 - I

- (23) The 3<sup>rd</sup> term of a G.P is 2/3 and 6<sup>th</sup> term is 2/81, then the first term is  
 a. 6                          b. 1/3  
 c. 9                          d. 2

MTP Dec 2023 Series II

- (24) Find the sum to infinity of the following series:  $1 - 1 + 1 - 1 + 1 - 1 + \dots$   
 a. 1                          b.  $\infty$   
 c.  $\frac{1}{2}$                         d. Does not exist

MTP Dec 2023 Series II

- (25) Find the product of:  
 $\star (243), (243)^{1/6}, (243)^{1/36}, \dots, \infty$   
 a. 1,024                    b. 27  
 c. 729                      d. 243

MTP June 24 Series II

- (26) The sum of the first eight terms of a G.P. is five times the sum of the first four terms; then the common ratio is -  
 a.  $\sqrt{2}$                       b.  $-\sqrt{2}$   
 c.  $\pm\sqrt{2}$                     d. None of these

MTP June 24 Series III

- (27) For what values of x, the number  $-2/7, x, -7/2$  are in G.P.?  
 a.  $\pm 1$                       b.  $\pm 3$   
 c.  $\pm 2$                       d. None of these

MTP June 24 Series III

- (28) If  $a^{1/x} = b^{1/y} = c^{1/z}$  and a, b, c are in GP then x, y, z are in  
 a. AP                      b. GP  
 c. HP                      d. None

Answer Key

1	a	2	a	3	a
4	d	5	b	6	c
7	c	8	d	9	b
10	c	11	c	12	b
13	a	14	a	15	b
16	d	17	b	18	d
19	c	20	d	21	d
22	b	23	a	24	c
25	c	26	c	27	a
28	a				

Other Problems

Past Year Questions

PYQ May 18

- (1) The sum of m terms of the series  $1+11+111+\dots$  up to m terms, is equal to:  
 a.  $\frac{1}{81}(10^{m+1} - 9m - 10)$   
 b.  $\frac{1}{27}(10^{m+1} - 9m - 10)$   
 c.  $10^{m+1} - 9m - 10$   
 d. None of these

PYQ Nov. 19

- (2) If  $\frac{(b+c-a)}{a}, \frac{(c+a-b)}{b}, \frac{(a+b-c)}{c}$  are in AP then a, b, c are in:  
 a. AP                      b. GP  
 c. HP                      d. None of these

Note: HP is out of syllabus.

PYQ Nov. 23

- (3) If the AM and GM of two numbers is 6.5 and 6 the no.'s are:  
 a. 3 and 2                      b. 9 and 4  
 c. 81 and 16                    d. None of these

PYQ Nov. 24

- (4) If AM and HM for two numbers are 5 and 3.2, respectively. GM will be:  
 a. 20                          b. 16  
 c. 4                              d. 5



- PYQ July 21
- (5) The sum of three numbers in a geometric progression is 28. When 7, 2 and 1 are subtracted from the first, second and the third numbers respectively, then the resulting numbers are in arithmetic progression. What is the sum of squares of the original three numbers?
- a. 510                      b. 456  
c. 400                        d. 336

Note: Extra lengthy solution.

- PYQ Jan. 21
- (6) The  $n^{\text{th}}$  term of the series  $3 + 7 + 13 + 21 + 31 + \dots$  is
- a.  $4n - 1$                       b.  $n^2 + 2n$   
c.  $n^2 + n + 1$                 d.  $n^3 + 2$

- PYQ Sep 24
- (7) The numbers  $x, 8, y$  are in G.P. and the numbers  $x, y, -8$  are in A.P. The values of  $x$  and  $y$  respectively shall be:
- a. 4, 16                        b. 16, 4  
c. 4, 8                         d. 8, 4

#### Answer Key

- |     |     |     |
|-----|-----|-----|
| 1 a | 2 c | 3 b |
| 4 c | 5 d | 6 c |
| 7 b |     |     |

#### Other Problems

#### Mock Test Paper Questions

- MTP May 20
- (1) Three numbers are in AP and their sum is 21. If 1, 5, 15 are added to them respectively, they form a G. P. The numbers are
- a. 5, 7, 9                      b. 9, 5, 7  
c. 7, 5, 9                      d. none of these
- MTP May 20
- (2) The sum of three numbers in G.P. is 70. If the two extremes be multiplied each by 4 and the mean by 5, the products are in AP. The numbers are
- a. 12, 18, 40                b. 10, 20, 40  
c. 40, 20, 15                d. none of these
- MTP Nov 20
- (3) If  $a, b, c$  are in AP and  $x, y, z$  are in GP, then the value of  $x^{(b-c)} \cdot y^{(c-a)} \cdot z^{(a-b)}$  is

- a. 1                              b. 0  
c.  $b(c-a)$                     d. none of these

MTP Apr 21

- (4) If  $a^{1/x} = b^{1/y} = c^{1/z}$  and  $a, b, c$  are in G.P; the  $x, y, z$  are in:
- a. A.P                        b. G.P  
c. Both (a),(b)              d. None of these

MTP March 22

- (5) If  $x, y$  and  $z$  are the terms in G.P, then the term  $x^2 + y^2, xy+yz, y^2 + z^2$  are in
- a. AP                        b. GP  
c. HP                        d. None of these

MTP May 18

- (6) If  $a^{1/x} = b^{1/y} = c^{1/z}$  then  $a, b, c$  are in GP then  $x, y, z$  are in
- a. AP                        b. GP  
c. HP                        d. AGP

MTP Nov 20

- (7) The sum of the first two terms of an infinite geometric series is 15 and each term is equal to the sum of all the terms following it; then the sum of the series is
- a. 20                        b. 15  
c. 25                        d. None

Note: Extra lengthy solution

MTP March 21

- (8)  $\sum n^2$  defines:
- a.  $\frac{n(n+1)(2n+1)}{6}$                 b.  $\frac{n(n+1)}{2}$   
c.  $\left[ \frac{n(n+1)}{2} \right]$                       d. none of these

MTP June 2023 Series I

- (9) Find the sum to  $n$  terms of the series:  $7+77+777+\dots$  to  $n$  terms:
- a.  $\frac{7}{9}(10^{n+1}-10) - \frac{7n}{9}$   
b.  $\frac{7}{9}(10^{n+1}-10) + \frac{7n}{9}$   
c.  $\frac{7}{9} \left[ \frac{10(10^n-1)}{9} - n \right]$   
d.  $\frac{7}{81}(10^{n+1}-10) + \frac{7n}{9}$

MTP Dec 2023 Series II

(10) The sum of the series  $1 + 11 + 111 + \dots$  to  $n$  terms is

- a.  $\frac{1}{27}(10^{n+1} - 9n - 10)$
- b.  $10^{n+1} - 9n - 10$
- c.  $\frac{1}{81}(10^{n+1} - 9n - 10)$
- d. None of these

MTP June 24 Series II

(11) The sum of the following series  $4 + 44 + 444 + \dots$  to  $n$  term is:

- a.  $\frac{4}{9} \left[ \frac{10(10^n - 1)}{9} - n \right]$
- b.  $\frac{4}{9} \left[ \frac{10(10^n - 1)}{9} + n \right]$
- c.  $\frac{10(10^n - 1)}{9} + n$
- d. None of these

MTP June 24 Series II

(12) Find the sum of the series.  $243 + 324 + 432 + \dots$  to  $n$  terms

- a.  $3^6 \left( \frac{4^n}{3^n} - 1 \right)$
- b.  $3^4 \left( \frac{4^n}{3^n} - 1 \right)$
- c.  $3^6 \left( \frac{3^n}{4^n} - 1 \right)$
- d. none of these

Answer Key

- |      |      |      |
|------|------|------|
| 1 a  | 2 b  | 3 a  |
| 4 a  | 5 b  | 6 a  |
| 7 a  | 8 a  | 9 c  |
| 10 c | 11 a | 12 a |