

Maxprap. Chapter wise Series Class 10th – Mathematics

Class : 10th

Topic : Arithmetic Progression

Max. Marks : 50

Duration : 2 Hrs

Sections: A (MCQs), B (Short Answer-I), C (Short Answer-II), D (Long Answer), E (Case-Based).

General Instructions:

- (i). All questions are compulsory.
- (ii). This question paper contains 23 questions divided into five Sections A, B, C, D and E.
- (iii). Section A comprises of 10 MCQs of 1 mark each. Section B comprises of 5 questions of 2 marks each. Section C comprises of 4 questions of 3 marks each. Section D comprises of 2 question of 5 marks each and Section E comprises of 2 Case Study Based Questions of 4 marks each.
- (iv). There is no overall choice.
- (v). Use of Calculators is not permitted.
- (vi). Draw neat figures wherever required. Take $\pi = 22/7$, wherever required if not stated.

Section A

Questions 1 to 10 carry 1 mark each

1. The common difference of the A.P. whose n^{th} term is given by $a_n = 3n + 7$, is:
a) 3 b) 7 c) $3n$ d) 1
2. The sum of first n terms of an AP is $(4n^2 + 2n)$. The n^{th} term of this AP is
a) $(6n - 2)$ b) $(8n - 2)$ c) $(7n - 3)$ d) $(8n + 2)$
3. In an A.P., if $d = -4$, $n = 7$ and $a_n = 4$, then 'a' is
a) 28 b) 6 c) 20 d) 7
4. Which term of the A.P. 21, 18, 15,is -81 ?
a) 36 b) 35 c) 30 d) 24
5. Which term of the A.P. 121, 117, 113, ... is its first negative term?
a) 33 b) 30 c) 31 d) 32
6. If the sum of n terms of an A.P. be $3n^2 + n$ and its common difference is 6 then its first term is
a) 3 b) 4 c) 2 d) 1
7. The number of two digit numbers divisible by 3 is
a) 3 b) 31 c) 29 d) 30
8. The sum of the first 100 even natural numbers is:
a) 2550 b) 10100 c) 5050 d) 10010

Assertion(A)/Reason(R) Based (9-10): In the following questions, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

- a) Both A and R are true and R is the correct explanation of A.
- b) Both A and R are true but R is not the correct explanation of A.
- c) A is true but R is false.
- d) A is false but R is true.

9. Assertion (A): Common difference of the A.P. 5, 1, -3, -7 ...is 4.

Reason (R): Common difference of the A.P. $a_1, a_2, a_3 \dots a_n$ is obtained by $d = a_n - a_{n-1}$.

10. Assertion (A): The sum of the first n terms of an AP is given by $S_n = 3n^2 - 4n$. Then its nth term $a_n = 6n - 7$.

Reason (R): nth term of an AP, whose sum to n terms is S_n , is given by $a_n = S_n - S_{n-1}$.

SECTION – B

Questions 11 to 15 carry 2 marks each

- 11. If the nth terms of the two APs: 9, 7, 5, ... and 24, 21, 18,... are the same, find the value of n. Also find that term.
- 12. Find the sum of the first 40 positive integers divisible by 3.
- 13. Is 200 any term of the sequence 3, 7, 11, 15, ...?
- 14. The n^{th} term of an AP is given as $a_n = 2n + 3$. Find its 6th term and 20th term.
- 15. In an AP, the first term is -4, the last term is 29 and the sum of all its terms is 150. Find its common difference.

SECTION – C

Questions 16 to 19 carry 3 marks each

- 16. How many three - digit number are divisible by 7?
- 17. Find the 20th term of an A.P. whose 3rd term is 7 and the seventh term exceeds three times the 3rd term by 2. Also, find its nth term (a_n).
- 18. The first and the last terms of an AP are 5 and 45 respectively. If the sum of all its terms is 400, find the common difference and the number of terms.
- 19. The sum of the 4th and 8th terms of an AP is 24 and the sum of the 6th and 10th terms is 44. Find the first three terms of the AP.

SECTION – D

Questions 20 to 21 carry 5 marks each

20. Solve the equation for x : $1 + 4 + 7 + 10 + \dots + x = 287$.

21. If the sum of the first n terms of an A.P. is $4n - n^2$, what is the first term? What is the sum of first two terms? What is the second term? Similarly, find the third, the tenth and the n th term.

SECTION – E (Case Study Based Questions)

Questions 22 & 23 carry 4 marks each

22. Read the following text carefully and answer the questions that follow:

ABC Technology is a TV manufacturer company. It produces smart TV sets not only for the Indian market but also exports them to many foreign countries. Their TV sets have been in demand every time but due to the Covid - 19 pandemic, they are not getting sufficient spare parts especially chips to accelerate the production. They have to work in a limited capacity due to the lack of raw material.



They produced 600 sets in the third year and 700 sets in the seventh year. Assuming that the production increases uniformly by a fixed number every year, find:

- a) the production in the 1st year. (2)
- b) the production in the 10th year. (1)
- c) the total production in first 7 years. (1)

Read the following text carefully and answer the questions that follow:

Akshaya's father is planning some construction work in his terrace area. He ordered 360 bricks and instructed the supplier to keep the bricks in such a way that the bottom row has 30 bricks and next is one less than that and so on.



The supplier stacked these 360 bricks in the following manner, 30 bricks in the bottom row, 29 bricks in the next row, 28 bricks in the row next to it, and so on.

- d) In how many rows, 360 bricks are placed? (1)
- e) How many bricks are there in the top row? (1)
- f) How many bricks are there in 10^{th} row? (2)

OR

If which row 26 bricks are there? (2)

Arithmetic Progression Paper Details – Analysis		
Objective Questions		
MCQ	1 marks x 8 question = 8	
Assertion Reason	1 marks x 2 question = 2	
Subjective		
Short type I	2 marks x 5 question = 10	
Short type II	3 marks x 4 question = 12	
Long Type	5 marks x 2 question = 10	
Case Studies Based		
Case 1	4 marks	
Case 2	4 marks	

Total = 50 marks Your Score =