

9. The n th term of the A.P. 63, 65, 67, 69, ... and the A.P. 3, 10, 17, 24, ... are equal, then the value of n is [1]
 a) 14 b) 15
 c) 13 d) 12
10. In an AP, if $a = 3.5$, $d = 0$ and $n = 101$, then $a_n =$ [1]
 a) 0 b) 1
 c) 103.5 d) 3.5
11. **Assertion (A):** Sum of first 10 terms of the arithmetic progression -0.5, -1.0, -1.5, ... is -27.5 [1]
Reason (R): Sum of n terms of an A.P. is given as $S_n = \frac{n}{2}[2a + (n - 1)d]$ where a = first term, d = common difference.
 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.
12. **Assertion (A):** Sum of first n terms in an A.P. is given by the formula: $S_n = \frac{n}{2} \times [2a + (n - 1)d]$ [1]
Reason (R): Sum of first 15 terms of 2, 5, 8 ... is 345.
 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.
13. **Assertion (A):** Sum of first hundred even natural numbers divisible by 5 is 500 [1]
Reason (R): Sum of first n -terms of an A.P. is given by $S_n = \frac{n}{2}[a + l]$ where l = last term.
 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.
14. **Assertion (A):** Common difference of an AP in which $a_{21} - a_7 = 84$ is 14 [1]
Reason (R): n th term of AP is given by $a_n = a + (n - 1)d$
 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.
15. **Assertion (A):** $a_n - a_{n-1}$ is not independent of n then the given sequence is an AP. [1]
Reason (R): Common difference $d = a_n - a_{n-1}$ is constant or independent of n .
 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.
16. **Assertion (A):** The constant difference between any two terms of an AP is commonly known as common difference. [1]
Reason (R): The common difference of 2, 4, 6, 8 this A.P. is 2.
 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.

- explanation of A. correct explanation of A.
- c) A is true but R is false. d) A is false but R is true.
17. **Assertion (A):** Common difference of the A.P. 5, 1, -3, -7 ... is 4. [1]
Reason (R): Common difference of the A.P. $a_1, a_2, a_3 \dots a_n$ is obtained by $d = a_n - a_{n-1}$.
- 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.
- [2024]
18. **Assertion (A):** a, b, c are in A.P. if and only if $2b = a + c$. [1]
Reason (R): The sum of first n odd natural numbers is n^2 .
- 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.
- [2023]
19. **Assertion (A):** The sum of the series with the nth term. $t_n = (9 - 5n)$ is (465), when no. of terms $n = 15$. [1]
Reason (R): Given series is in A.P. and sum of n terms of an A.P. is $S_n = \frac{n}{2}[2a + (n - 1)d]$
- 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.
20. **Assertion (A):** The 11th term of an AP is 7, 9, 11, 13 is 67. [1]
Reason (R): If s_n is the sum of first n terms of an AP then its nth term a_n is given by $a_n = s_n - s_{n-1}$.
- 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.
21. Find the indicated term of the sequence whose nth term is: $a_n = 5n - 4$; a_{12} and a_{15} [1]
22. In an A.P., if $d = -2$, $n = 5$ and $a_n = 0$, then find the value of a. [1]
- [2011]
23. Write the first four terms of the AP, when the first term $a = -1$ and the common difference $d = \frac{1}{2}$ [1]
24. Write the next term of the A.P. $\sqrt{2}, \sqrt{8}, \sqrt{18}, \dots$ [1]
- [2008]
25. Find the sum of each of the following APs: -37, -33, -29,... to 12 terms. [1]
26. The n^{th} term of an A.P. is $(5n - 2)$. Find its Common difference. [1]
- [2015]
27. What is the sum of first 20 odd natural numbers? [1]
- [2012]
28. If $\frac{3}{5}, a, 4$ are three consecutive terms of an A.P., then find the value of a. [1]
- [2021]
29. Does the sequence $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \dots$ form an AP? Justify your answer. [1]

30. Find the sum of the first 10 multiples of 3 [1]
[2019]

Section B

31. Find the sum of the first twelve 2-digit multiples of 7, using an AP. [2]
[2022]
32. Find the sum of first 17 terms of an AP whose 4th and 9th terms are -15 and -30 respectively. [2]
33. Which term of the sequence 114, 109, 104, is the first negative term? [2]
34. For an A.P., it is given that the first term (a) = 5, common difference (d) = 3, and the n^{th} term (a_n) = 50. Find n and sum of first n terms (S_n) of the A.P. [2]
[2020]
35. How many terms of the given AP: 24, 21, 18, . . . must be taken so that their sum becomes 78? [2]
[2020]
36. The ninth term of an A.P. is -32 and the sum of its eleventh and thirteenth term is -94 . Find the common difference of the A.P. [2]
[2015]
37. Are the given numbers form an AP? If they form an AP, write the next two terms: 1, -1, -3, -5, ... [2]
38. Find the number of all integers between 2 and 100, divisible by 3. [2]
[2020]
39. Which term of the A.P. : 65, 61, 57, 53, ... is the first negative term? [2]
[2023]
40. Find the sum of the first 51 terms of an AP whose second and third terms are 14 and 18 respectively. [2]

Section C

41. Determine the AP whose third term is 16 and the 7^{th} term exceeds the 5^{th} term by 12. [3]
[2019]
42. The sum of first n terms of three arithmetic progressions are S_1 , S_2 and S_3 respectively. The first term of each A.P. is 1 and common differences are 1, 2 and 3 respectively. Prove that $S_1 + S_3 = 2S_2$ [3]
[2016]
43. The 17th term of an AP exceeds its 10th term by 7. Find the common difference. [3]
[2019]
44. Find the sum of first n odd natural numbers. [3]
45. Two cars start together in the same direction from the same place. The first goes with uniform speed of 10 km/h. The second goes at a speed of 8 km/h in the first hour and increases the speed by $\frac{1}{2}$ km in each succeeding hour. Find after how many hours will the second car overtake the first car if both cars go non-stop. [3]
46. Yasmeeen saves Rs 32 during the first month, Rs 36 in the second month and Rs 40 in the third month. If she continues to save in this manner, in how many months will she save Rs 2000? [3]
47. Find the sum of the first 15 multiples of 8. [3]
[2022, 2017]
48. The 24^{th} term of an A.P. is twice its 10^{th} term. Show that its 72^{nd} term is 4 times its 15^{th} term. [3]
[2013]
49. Find the sum of all two-digit natural numbers which are divisible by 4. [3]
[2017]

50. Is the sequence 3, 6, 12, 24,... an arithmetic progression. If yes, find out the common difference. [3]

Section D

51. Read the following text carefully and answer the questions that follow: [4]

Sehaj Batra gets pocket money from his father every day. Out of pocket money, he saves money for poor people in his locality. On 1st day he saves ₹ 27.5 On each succeeding day he increases his saving by ₹ 2.5.



- Find the amount saved by Sehaj on 10th day. (1)
- Find the amount saved by Sehaj on 25th day. (1)
- Find the total amount saved by Sehaj in 30 days. (2)

OR

Find in how many days Sehaj saves ₹ 1400. (2)

52. In a school garden, Dinesh was given two types of plants viz. sunflower and rose flower as shown in the following figure. [4]



The distance between two plants is to be 5m, a basket filled with plants is kept at point A which is 10 m from the first plant. Dinesh has to take one plant from the basket and then he will have to plant it in a row as shown in the figure and then he has to return to the basket to collect another plant. He continues in the same way until all the flower plants in the basket. Dinesh has to plant ten numbers of flower plants.

Now answer the following questions:

- Find the distance covered by Dinesh to plant the first 5 plants and return to basket. (2)
 - Find the distance covered by Dinesh to plant all 10 plants and return to basket. (1)
 - If the speed of Dinesh is 10 m/min and he takes 15 minutes to plant a flower plant then find the total time taken by Dinesh to plant 10 plants. (1)
53. Read the following text carefully and answer the questions that follow: [4]
- Sumant's mother started a new shoe shop. To display the shoes, she put 3 pairs of shoes in the 1st row, 5 pairs in the 2nd row, 7 pairs in the 3rd row and so on.



Based on the above information, answer the following questions:

- i. How many pairs of shoes are displayed in the 6th row? (1)
- ii. What is the difference of pairs of shoes in the 1st row and the 6th row? (1)
- iii. a. Find the total number of pairs of shoes displayed in the first 15 rows. (2)

OR

- b. If the pairs of shoes displayed in the 4th row are 'on sale' at price of ₹ 500 for each pair, then find the total amount (money) earned by Sumant's mother if all shoes displayed in the 4th row are sold out. (2)

[2024]

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

[4]

Elpis 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 materials.



- i. 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 an increase in the production of TV every year. (1)
- ii. 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 in which year production of TV is 1000. (1)
- iii. 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 the production in the 10th year. (2)

OR

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 the total production in first 7 years. (2)

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

[4]

Your elder brother wants to buy a car and plans to take loan from a bank for his car. He repays his total loan of ₹ 1,18,000 by paying every month starting with the first instalment of ₹ 1000. If he increases the instalment by ₹ 100 every month, answer the following:



- i. Find the amount paid by him in 30th installment. (1)
- ii. Find the amount paid by him in 30 installments. (1)
- iii. If total installments are 40 then amount paid in the last installment? (2)

OR

Find the 10th installment, if the 1st installment is of ₹ 2000. (2)

56. Jaspal Singh is an auto driver. His autorickshaw was too old and he had to spend a lot of money on repair and maintenance every now and then. One day he got to know about the EV scheme of the Government of India where he can not only get a good exchange bonus but also avail heavy discounts on the purchase of an electric vehicle. So, he took a loan of Rs.1,18,000 from a reputed bank and purchased a new autorickshaw. [4]



Jaspal Singh repays his total loan of 118000 rupees by paying every month starting with the first instalment of 1000 rupees.

- i. If he increases the installment by 100 rupees every month, then what amount will be paid by him in the 4th installment? (1)
- ii. If he increases the installment by 100 rupees every month, then what amount will be paid by him in the 30th installment? (1)
- iii. What is the total amount paid till 30th installment?

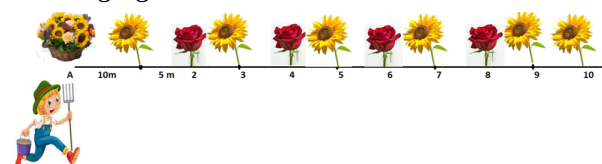
OR

What amount of loan does he still have to pay after 30th installment? (2)

[2012, 2011]

57. **Read the following text carefully and answer the questions that follow:** [4]

In a school garden, Dinesh was given two types of plants viz. sunflower and rose flower as shown in the following figure.



The distance between two plants is to be 5m, a basket filled with plants is kept at point A which is 10 m from the first plant. Dinesh has to take one plant from the basket and then he will have to plant it in a row as shown in the figure and then he has to return to the basket to collect another plant. He continues in the same way until all the flower plants in the basket. Dinesh has to plant ten numbers of flower plants.

- i. Write the above information in the progression and find first term and common difference. (1)
- ii. Find the distance covered by Dinesh to plant the first 5 plants and return to basket. (1)
- iii. Find the distance covered by Dinesh to plant all 10 plants and return to basket. (2)

OR

If the speed of Dinesh is 10 m/min and he takes 15 minutes to plant a flower plant then find the total time taken by Dinesh to plant 10 plants. (2)

58. Elpis Technology is a TV manufacturer company. It produces smart TV sets not only for the Indian market but [4]

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.

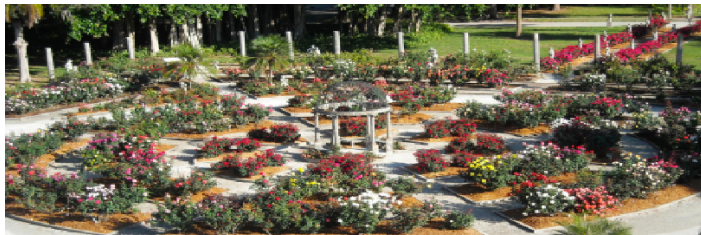


They produced 600 sets in the third year and 700 sets in the seventh year. Assuming that the production increases uniformly by a fixed number every year, find:

- i. the production in the 1st year **(2)**
- ii. the production in the 10th year **(1)**
- iii. the total production in first 7 years **(1)**

[2015]

59. Kamla and her husband were working in a factory in Seelampur, New Delhi. During the pandemic, they were asked to leave the job. As they have very limited resources to survive in a metro city, they decided to go back to their hometown in Himachal Pradesh. After a few months of struggle, they thought to grow roses in their fields and sell them to local vendors as roses have been always in demand. Their business started growing up and they hired many workers to manage their garden and do packaging of the flowers. **[4]**



In their garden bed, there are 23 rose plants in the first row, 21 are in the 2nd, 19 in 3rd row and so on. There are 5 plants in the last row.

- i. How many rows are there of rose plants?
- ii. Also, find the total number of rose plants in the garden.

[2012]

60. **Read the following text carefully and answer the questions that follow:** **[4]**

India is competitive manufacturing location due to the low cost of manpower and strong technical and engineering capabilities contributing to higher quality production runs. The production of TV sets in a factory increases uniformly by a fixed number every year. It produced 16000 sets in 6th year and 22600 in 9th year.



- i. Find the production during first year. (1)
- ii. Find the production during 8th year. (1)
- iii. Find the production during first 3 years. (2)

OR

In which year, the production is ₹ 29,200. (2)

Section E

61. How many terms of the A.P. 27, 24, 21, ... must be taken so that their sum is 105? Which term of the A.P. is zero? [5]
[2024]
62. Find the sum of all integers between 100 and 550 which are not divisible by 9. [5]
63. Find the 20th term from the last term of the AP : 3, 8, 13, ..., 253. [5]
64. If the sum of the first 7 terms of an A.P. is -21 and that of the first 17 terms is -221, then find the sum of its first n terms. [5]
[2023]
65. Let there be an A.P. with first term 'a', common difference 'd'. If a_n denotes its n^{th} term and S_n the sum of first n terms, find. k, if $S_n = 3n^2 + 5n$ and $a_k = 164$. [5]
66. A man arranges to pay off a debt of Rs.3600 by 40 annual installments which form an arithmetic series. When 30 of the installments are paid, he dies leaving one-third of the debt unpaid, find the value of the first installment. [5]
67. Find the sum of $-5 + (-8) + (-11) + \dots + (-230)$. [5]
[2020]
68. The sum of the 4^{th} and the 8^{th} terms of an AP is 24 and the sum of its 6^{th} and 10^{th} terms is 44. Find the sum of its first 10 terms. [5]
[2013]
69. The second term of an A.P. is 29 and the fourth term is 51. If the last term of the A.P. is 425, find how many terms are there and what is their sum. [5]
[2024]
70. A ladder has rungs 25 cm apart. The rungs decrease uniformly in length from 45 cm at the bottom to 25 cm at the top. If the top and bottom rungs are $2\frac{1}{2}$ m apart, what is the length of the wood required for the rungs? [5]
[Hint: Number of rungs = $\frac{250}{25} + 1$]

