EXERCISE # 1

A. Very Short Answer Type Questions

Q.1 Write the first four terms of each of the following sequences whose n^{th} terms are -

(i) $a_n = 3n + 2$

(ii) $a_n = \dfrac{n-2}{3}$

(iii) $a_n = 3^n$

(iv) $a_n = \dfrac{3n-2}{5}$

(v) $a_n = (-1)^n \cdot 2^n$

(vi) $a_n = \dfrac{n(n-2)}{2}$

(vii) $a_n = n^2 - n + 1$

(viii) $a_n = 2n^2 - 3n + 1$

(ix) $a_n = \dfrac{2n-3}{6}$

Q.2 The general term of a sequence is given by $a_n = -4n + 15$. Is the sequence an A.P. ? If so, find its 15th term and the common difference.

Q.3 The first term of an A.P. is 5, the common difference is 3 and the last term is 80; find the number of terms.

B. Short answer type Questions

Q.4 Find :

(i) 10th term of the A.P. 1, 4, 7, 10, ...

(ii) 18th term of the A.P. $\sqrt{2}$, $3\sqrt{2}$, $5\sqrt{2}$, ...

(iii) n^{th} term of the A.P. 13, 8, 3, –2, ...

Q.5 (i) Which term of the A.P. 3, 8, 13, ... is 248 ?

(ii) Which term of the A.P. 84, 80, 76, ... is 0 ?

(iii) Which term of the A.P. 4, 9, 14, ... is 254 ?

Q.6 (i) Is 68 a term of the A.P. 7, 10, 13, ... ?

(ii) Is 302 a term of the A.P. 3, 8, 13, ... ?

Q.7 (i) How many terms are there in the A.P. 7, 10, 13, ... 43 ?

(ii) How many terms are there in the A.P.

$-1, -\dfrac{5}{6}, -\dfrac{2}{3}, -\dfrac{1}{2}, ..., \dfrac{10}{3}$?

Q.8 The 10th and 18th terms of an A.P. are 41 and 73 respectively. Find 26th term.

Q.9 If 10 times the 10th term of an A.P. is equal to 15 times the 15th term, show that 25th term of the A.P. is zero.

Q.10 The 6th and 17th terms of an A.P. are 19 and 41 respectively, find the 40th term.

Q.11 Find the sum of all odd numbers between 100 and 200.

Q.12 Find the sum of all integers between 84 and 719, which are multiples of 5.

Q.13 Find the sum of all integers between 50 and 500 which are divisible by 7.

C. Long answer type Questions

Q.14 In a certain A.P. the 24th term is twice the 10th term. Prove that the 72nd term is twice the 34th term.

Q.15 If $(m + 1)^{th}$ term of an A.P. is twice the $(n + 1)^{th}$ term, prove that $(3m + 1)^{th}$ term is twice the $(m + n + 1)^{th}$ term.

Q.16 If the nth term of the A.P. 9, 7, 5, ... is same as the nth term of the A.P. 15, 12, 9, ... find n.

Q.17 The sum of three terms of an A.P. is 21 and the product of the first and the third terms exceeds the second term by 6, find three terms.

Q.18 Three numbers are in A.P. If the sum of these numbers be 27 and the product 648, find the numbers.

Q.19 The angles of a quadrilateral are in A.P. whose common difference is 10º. Find the angles.

Q.20 Find the four numbers in A.P., whose sum is 50 and in which the greatest number is 4 times the least.

Q.21 Find the sum of the following arithmetic progressions :

(i) $a + b$, $a - b$, $a - 3b$, ... to 22 terms

(ii) $(x - y)^2$, $(x^2 + y^2)$, $(x + y)^2$, ... to n terms

(iii) $\dfrac{x - y}{x + y}$, $\dfrac{3x - 2y}{x + y}$, $\dfrac{5x - 3y}{x + y}$, to n terms

Q.22 Find the sum of n terms of an A.P. whose nth terms is given by $a_n = 5 - 6n$.

Q.23 How many terms are there in the A.P. whose first and fifth terms are – 14 and 2 respectively and the sum of the terms is 40 ?

Q.24 The third term of an A.P. is 7 and the seventh term exceeds three times the third term by 2. Find the first term, the common difference and the sum of first 20 terms.

Q.25 The first term of an A.P. is 2 and the last term is 50. The sum of all these terms is 442. Find the common difference.

Q.26 If 12th term of an A.P. is –13 and the sum of the first four terms is 24, what is the sum of first 10 terms ?

Q.27 Show that the sum of all odd integers between 1 and 1000 which are divisible by 3 is 83667.

Q.28 In an A.P., if the 5th and 12th terms are 30 and 65 respectively, what is the sum of first 20 terms.

Q.29 The production of TV in a factory increases uniformly by a fixed number every year if produced 8000 acts in 6th years & 11300 in 9th year find the production in (i) first year (ii) 8th year (iii) 6th year.

Q.30 A sum of ⌡-2800 is to be used to award four prizes. If each prize after the first prize is ⌡-200 less than the preceding prize, find the value of each of the prizes.

ANSWER KEY

A. VERY SHORT ANSWER TYPE :

1. (i) 5, 8, 11, 14   (ii) $-\frac{1}{3}$, 0, $\frac{1}{3}$, $\frac{2}{3}$ (iii) 3, 9, 27, 81 (iv) $\frac{1}{5}$, $\frac{3}{5}$, $\frac{7}{5}$, 2   (v) –2, 4, –8, 16 (vi) $-\frac{1}{2}$, 0, $\frac{3}{2}$, 4

   (vii) 1, 3, 7, 13   (viii) 0, 3, 10, 21   (ix) $-\frac{1}{6}$, $\frac{1}{6}$, $\frac{1}{2}$, $\frac{5}{6}$

2. –45, – 4   **3.** 26

B. SHORT ANSWER TYPE :

4. (i) 28   (ii) $35\sqrt{2}$ (iii) – 5n + 18   **5.** (i) 50   (ii) 22   (iii) 51 **6.** (i) No   (ii) No **7.** (i) 13 (ii) 27
8. 105   **10.** 87   **11.** 7500   **12.** 50800   **13.** 17696

C. LONG ANSWER TYPE :

16. 7   **17.** 1, 7, 13   **18.** 6, 9, 12   **19.** 75º, 85º, 95º, 105º   **20.** 5, 10, 15, 20

21. (i) 22a – 440b   (ii) n[(x – y)^2 + (n – 1) xy]   (iii) $\frac{n}{2(x+y)}$ [n (2x – y) – y]   **22.** n (2 – 3n)

23. 10   **24.** –1, 4, 740   **25.** 3   **26.** 0   **28.** 1150
29. (i) 2500 (ii) 10200 (iii) 31500   **30.** ₹ 1000, ₹ 800, ₹ 600, ₹ 400.

EXERCISE # 2

Q.1 How many two digit number are there which are divisible by 7 ?

(A) 13   (B) 14   (C) 15   (D) None

Q.2 How many numbers are there between 103 and 750 which are divisible by 6 ?

(A) 125   (B) 108   (C) 107   (D) 113

Q.3 The sum of first 60 natural numbers is –

(A) 1830   (B) 1640

(C) 3660   (D) 1770

Q.4 The sum of all 2 digit numbers is –

(A) 4750   (B) 4905   (C) 3776   (D) 4680

Q.5 23rd term of the A.P. 7, 5, 3, 1, ... is –

(A) 51   (B) 37

(C) –37   (D) –51

Q.6 If $(k + 1)$, $3k$ and $(4k + 2)$ be any three consecutive terms of an A.P., then the value of k is –

(A) 3   (B) 0   (C) 1   (D) 2

Q.7 Which term of the A.P. 5, 8, 11, 24 .... is 320 ?

(A) 104th (B) 105th (C) 106th (D) 64th

Q.8 The 5th and 13th terms of an A.P. are 5 and – 3 respectively. The first term of the A.P. is –

(A) 1   (B) 9   (C) –15   (D) 2

Q.9 Which term of the A.P. 64, 60, 56, 52, ...is zero?

(A) 16th (B) 17th (C) 14th (D) 15th

Q.10 The nth term of an A.P. is $(3n + 5)$. Its 7th term is –

(A) 26

(B) $(3n–2)$

(C) $3n + 12$

(D) cannot be determined

Q.11 The sides of a right angle triangle are in A.P. The ratio of side is –

(A) 1 : 2 : 3   (B) 2 : 3 : 4

(C) 3 : 4 : 5   (D) 5 : 8 : 3

Q.12 The sum of 1, 3, 5, 7, 9, ... upto 20 terms is–

(A) 400   (B) 563   (C) 472   (D) 264

Q.13 The sum of the series $5 + 13 + 21 + ... + 181$ is –

(A) 2139   (B) 2476

(C) 2219   (D) 2337

Q.14 The sum of all odd numbers between 100 and 200 is –

(A) 6200   (B) 6500   (C) 7500   (D) 3750

Q.15 The sum of all positive integral multiples of 5 less than 100 is –

(A) 950   (B) 1230

(C) 760   (D) 875

Q.16 The sum of all even natural numbers less than 100 is –

(A) 2450   (B) 2272

(C) 2352   (D) 2468

Q.17 Arithmetic mean between 14 and 18 is –

(A) 16   (B) 15   (C) 17   (D) 32

Q.18 If 4, A_1, A_2, A_3, 28 are in A.P., then the value of A_3 is –

(A) 23

(B) 22

(C) 19

(D) cannot be determined

Q.19 How many terms of the A.P. 3, 6, 9, 12, 15, ... must be taken to make the sum 108 ?

(A) 6   (B) 7   (C) 8   (D) 36

Q.20 The 6th and 8th terms of an A.P. are 12 and 22 respectively, Its 2nd term is –

(A) 8   (B) –8   (C) 6   (D) –3

Q.21 In an AP, then sum of first n terms is $\left(\dfrac{3n^2}{2} + \dfrac{5n}{2} \right)$. Find its 25th term.

(A) 924   (B) 76   (C) 1924   (D) 1848

Q.22 200 logs are stocked in such a way that there are 20 logs in the bottom row, 19 in the next row, 18 in the next row and so on. In how many row 200 logs are placed and how many logs are there in the top row ?

(A) 19, 5   (B) 16, 5

(C) 10, 20   (D) 20, 7

ANSWER KEY

Q.No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Ans.	A	B	A	B	C	A	C	B	B	A	C	A	A	C	A	A	A	B

Q.No	19	20	21	22
Ans.	C	B	B	B