JEE (Main+Advanced):NURTURE COURSE

TARGET : JEE (M+A) 2021

TOPIC : SEQUENCE & SERIES   **DPP - 1**

1. Find the 10th term of the progression $-4 - 1 + 2 + 5 + ...$

2. If $(m+2)^{th}$ term of an A.P. is $(m+2)^2 - m^2,$ then find its common difference.

3. In the following two A.P.'s how many terms are identical ? 2, 5, 8, 11, ... to 60 terms and 3, 5, 7,...., 50 terms.

4. If the sum of n terms of an A.P. is $n^2 + n$ then find its nth term.

5. If the ratio of sum of n terms of two A.P.'s is $(n+3):(n+5),$ then ratio of their 12th terms.

6. Let the sum of n, 2n, 3n terms of an A.P. be S_1, S_2 and $S_3.$ respectively, show that $S_3 = 3(S_2 - S_1).$

7. Find the sum of all numbers between 200 and 400 which are divisible by 7.

8. Find the sum of inteers from 1 to 100 that are divided by 2 or 5.

9. Find the sum of all two digit numbers which when divided by 4, yields 1 as remainder.

10. If the sum of n terms of an A.P. is given by $S_n = 3n + 2n^2,$ then the common difference of the A.P. is :
(a) 3   (b) 2
(c) 6   (d) 4

11. If 9 times the 9th terms of an A.P. is equal to 13 times the 13th term, then the 22nd term of the A.P. is :
(a) 0   (b) 22
(c) 220   (d) 198

12. If in an A.P., $S_n = qn^2$ and $S_m = qm^2,$ where S_r denotes the sum of r terms of the A.P., then S_q equals:

(a) $\dfrac{q^3}{2}$ (b) mnq

(c) q^3 (d) $(m+n)q^2$

13. Let S_n denote the sum of the first n terms of an A.P. If $S_{2n} = 3S_n$ then $S_{3n} : S_n$ is equal to :
(a) 4   (b) 6
(c) 8   (d) 10

14. If $1, \log_3 \sqrt{(3^{1-x} + 2)}, \log_3 (4 \cdot 3^x - 1)$ are in A.P. Then, x equals :

(a) $\log_3 4$ (b) $1 - \log_3 4$

(c) $1 - \log_4 3$ (d) $\log_4 3$

15. Let T_r be the rth term of an A.P. whose first term is a and common difference is d. If for some

positive integers $m, n, m \equiv n, T_m = \dfrac{1}{n}$ and $T_n = \dfrac{1}{m}$ and $a - d$ equals :

(a) 0   (b) 1

(c) $\dfrac{1}{mn}$ (d) $\dfrac{1}{m} + \dfrac{1}{n}$

16. Let $a_1, a_2, a_3 \ldots\ldots$ be terms of an A.P. If $\dfrac{a_1 + a_2 + \ldots. + a_p}{a_1 + a_2 + \ldots. + a_q} = \dfrac{p^2}{q^2}, p \neq q,$ then $\dfrac{a_6}{a_{21}}$ equals :

(a) $\dfrac{7}{2}$ (b) $\dfrac{2}{7}$

(c) $\dfrac{11}{41}$ (d) $\dfrac{41}{11}$

17. A person is to count 4500 currency notes. Let a_n denotes the number of notes he counts in the nth minute.

If $a_1 = a_2 \ldots\ldots = a_{10} = 150$ and $a_{10}, a_{11} \ldots\ldots$ are in A.P. with common difference -2, then the time taken by him to count all notes, is :
(a) 24 min (b) 34 min
(c) 125 min (d) 135 min

18. Let a_n be the nth term of an A.P. If $\displaystyle\sum_{r=1}^{100} a_{2r} = \alpha$ and $\displaystyle\sum_{r=1}^{100} a_{2r-1} = \beta,$ then the common difference of the A.P.

is:

(a) $\dfrac{\alpha - \beta}{200}$ (b) $\alpha - \beta$

(c) $\dfrac{\alpha - \beta}{100}$ (d) $\beta - \alpha$

19. A man saves Rs. 200 in each of the first three months of his service. In each of the subsequent months his saving increases by Rs. 40 more than the saving of immediately previous month. His total saving from the start of service will be Rs. 11040 after :
(a) 19 months (b) 20 months
(c) 21 months (d) 18 months

20. Let α and β be the roots of the equation $px^2 + qx + r = 0, p \neq 0.$ If p, q, r are in A.P., and $\dfrac{1}{\alpha} + \dfrac{1}{\beta} = 4,$

then the value of $|\alpha - \beta|$ is :

(a) $\dfrac{\sqrt{61}}{9}$ (b) $\dfrac{2\sqrt{17}}{9}$

(c) $\dfrac{\sqrt{34}}{9}$ (d) $\dfrac{2\sqrt{13}}{9}$