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SERIES - 1

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Board Exam ‘2021’

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CLASS – 10th**Subject – Mathematics****“Arithmetic Progression”****2 Marks Questions.**

- Find the arithmetic mean of $\frac{1}{2}$ and $\frac{-1}{2}$.
- Find the arithmetic mean of x^2+3xy and y^2-3xy .
- Find the sum of following arithmetic progressions:
 - 9,12,15.....up to 16 terms.
 - 8,3,-2,.....up to 22 terms.
 - $\frac{n^2+1}{n}, n, \frac{n^2-1}{n}, \dots$ up to 20 terms.
- Find the arithmetic mean of $\sqrt{2} + 1$ and $\sqrt{2} - 1$

“3” Marks Questions:

- If in an arithmetic progression the mean of p^{th} and a^{th} term is equal to mean of r^{th} and s^{th} term then prove that $p + q = r + s$.
- How many terms of the arithmetic progression 24,21,18,... must be taken so their sum is 78 ?
- Sum of first n terms of an arithmetic progression is n^2+4n . Find the 15th term of the progression.

“6” Marks Questions:

- Arithmetic mean and product of two numbers are 7 and 45 respectively. Find the numbers.
- Arithmetic mean and sum of squares of two numbers are 6 and 90. Find the numbers.
- Form an AP by inserting 6 terms between -4 and 10.

4. n terms lie between 7 and 49 in an AP. If ratio of the fourth term and the $(n-1)^{\text{th}}$ term is 5:4, then find the value of n.
5. Find the sum of all multiples of 3 natural number between 1 and 100.
6. If the sum of first 7 terms of an arithmetic progression is 49 and that of 17 terms is 289, find the sum of first n terms.
7. If first second and last terms are respectively a,b and 2a of an arithmetic progression then prove that sum of progression will be $\frac{3ab}{2(b-a)}$.
8. Sum of p^{th} , q^{th} , r^{th} terms of an arithmetic progressions are a,b,c, respectively, then prove that
$$\frac{a}{p}(a-r) + \frac{b}{q}(r-p) + \frac{c}{f}(p-q) = 0$$
9. Sum of n term of three arithmetic progressions are S_1, S_2, S_3 respectively. First term is 1 for every progression and common differences are 1,2,3 respectively then prove that $S_1 + S_3 = 2S_2$
10. If sum of n, 2n, 3n terms of an arithmetic progression are S_1, S_2, S_3 respectively then prove that $S_3 = 3(S_2 - S_1)$.
11. If in an arithmetic progression the p^{th} term is q and q^{th} term is p, then find m^{th} term.
12. Find the sum of all odd numbers between 100 and 200.