

Assignment-1

EE24BTECH11020 - Ellanti Rohith

- 1) If, for positive integer n , the quadratic equation, $x(x+1)+(x+1)(x+2)+\dots+(x+n-1)(x+n) = 10n$ has two consecutive integral solutions, then n is equal to: [JEE M 2017]
 - a) 11
 - b) 12
 - c) 9
 - d) 10
- 2) For any three positive real number a, b and c $9(25a^2 + b^2) + 25(c^2 - 3ac) = 15b(3a + c)$. Then: [JEE M 2017]
 - a) a, b and c are in A.P
 - b) b, c and a are in G.P
 - c) b, c and a are in A.P
 - d) a, b and c are in G.P
- 3) Let $a, b, c \in \mathbb{R}$. If $f(x) = ax^2 + bx + c$ is such that $a + b + c = 3$ and $f(x+y) = f(x) + f(y) \forall x, y \in \mathbb{R}$, then $\sum_{n=1}^{10} f(n)$ is equal to [2017]
 - (a) 255
 - (b) 330
 - (c) 165
 - (d) 190
- 4) Let $a_1, a_2, a_3, \dots, a_{49}$ be an A.P such that $\sum_{k=0}^{12} a_{4k+1} = 416$ and $a_9 + a_{43} = 66$. If $a_1^2 + a_2^2 + \dots + a_{17}^2 = 140m$, then m is equal to: [JEE M 2018]
 - a) 68
 - b) 34
 - c) 33
 - d) 66
- 5) Let A be the sum of the first 20 terms and B be the sum of the first 40 terms of the series $\left[1^2 + 2 \cdot 2^2 + 3^2 + 2 \cdot 4^2 + 5^2 + 2 \cdot 6^2 + \dots\right]$. If $B - 2A = 100\lambda$, then λ can be [2018]
 - a) 248
 - b) 464
 - c) 496
 - d) 232
- 6) If a, b and c be three distinct real numbers in GP. and $a + b + c = xb$, then x cannot be: [JEE M 2019]
 - a) -2
 - b) 4
 - c) -3
 - d) 2
- 7) Let a_1, a_2, \dots, a_{30} be an A.P, $S = \sum_{i=1}^{30} a_i$ and $T = \sum_{i=2}^{15} a_{(2i-1)}$. If $a_5 = 27$ and $S - 2T = 75$, then a_{10} is equal to [JEE M 2019]
 - a) 52
 - b) 57
 - c) 47
 - d) 42
- 8) Three circles of radii a, b, c ($a < b < c$) touch each other externally. If they have x-axis as a common tangent, then: [JEE M 2019]
 - a) $\frac{1}{\sqrt{a}} = \frac{1}{\sqrt{b}} + \frac{1}{\sqrt{c}}$
 - b) $\frac{1}{\sqrt{b}} = \frac{1}{\sqrt{c}} + \frac{1}{\sqrt{a}}$
 - c) a, b and c are in A.P
 - d) $\sqrt{a} = \sqrt{b} + \sqrt{c}$
- 9) Let the sum of the first n terms of a non-constant A.P a_1, a_2, a_3, \dots be $50n + \frac{n(n-7)}{2}A$, where A is a constant. If d is the common difference of this A.P, then ordered pair (d, a_{50}) is equal to [JEE M 2019]
 - a) $(50, 50 + 46A)$
 - b) $(50, 50 + 45A)$
 - c) $(A, 50 + 45A)$
 - d) $(A, 50 + 46A)$