Sequences and Series

Q.No.1:
The sum of first 20 terms of the sequence 0.7, 0.77, 0.777, ..., is :

JEE 2013

A. $\dfrac{7}{81}\left(179-10^{-20}\right)$

B. $\dfrac{7}{9}\left(99-10^{-20}\right)$

C. $\dfrac{7}{81}\left(179+10^{-20}\right)$

D. $\dfrac{7}{9}\left(99+10^{-20}\right)$

Q.No.2: If m is the A.M. of two distinct real numbers ℓ and n ($\ell, n > 1$) and G1, G2 and G3 are three geometric means between ℓ and n, then $G_1^4 + 2G_2^4 + G_3^4$ equals,

JEE 2015

A. $4\ell^2\, mn$

B. $4\ell m^2 n$

C. $4\ell mn^2$

D. $4\ell^2 m^2 n^2$

Q.No.3: The sum of first 9 terms of the series $\dfrac{1^3}{1} + \dfrac{1^3+2^3}{1+3} + \dfrac{1^3+2^3+3^3}{1+3+5}+\ldots$ is

JEE 2015

A. 71

B. 96

C. 142

D. 192

Q.No.4: If the 2nd, 5th and 9th terms of a non-constant A.P. are in G.P., then the common ratio of this G.P. is : **JEE 2016**

    A. $\frac{4}{3}$

    B. 1

    C. $\frac{7}{4}$

    D. $\frac{8}{5}$

Q.No.5: If the sum of the first ten terms of the series

$$\left(1\frac{3}{5}\right)^2 + \left(2\frac{2}{5}\right)^2 + \left(3\frac{1}{5}\right)^2 + 4^2 + \left(4\frac{4}{5}\right)^2 + \ldots, \text{ is } \frac{16}{5}m, \text{ then m is equal to :}$$

JEE 2016

    A. 101

    B. 100

    C. 99

    D. 102

Q.No.6: For any three positive real numbers a, b and c, $9(25a^2 + b^2) + 25(c^2 - 3ac) = 15b(3a + c)$, Then **JEE 2017**

    A. b , c and a are in G.P.

    B. b, c and a are in A.P.

    C. a, b and c are in A.P.

    D. a, b and c are in G.P.

Q.No.7: Let a_1, a_2, a_3, ..., a_{49}, be in A.P. such that $\sum_{k=0}^{12} a_{4k+1} = 416$ and $a_9 + a_{43} = 66$. If $a_1^2 + a_2^2 + \ldots + a_{17}^2 = 140$ m, then m is equal to : **JEE 2018**

    A. 34

    B. 33

    C. 66

    D. 68

Q.No.8: Let A be the sum of the first 20 terms and B be the sum of the first 40 terms of the series

$1^2 + 2 \cdot 2^2 + 3^2 + 2 \cdot 4^2 + 5^2 + 2 \cdot 6^2 + \ldots$

If B − 2A = 100 λ, then λ is equal to : **JEE 2018**

    A. 464

    B. 496

    C. 232

    D. 248

Q.No.9: If a, b and c be three distinct real numbers in G.P, and $a + b + c = xb$, then x cannot be: **JEE 2019**

    A. −2

    B. −3

    C. 4

    D. 2

Q.No.10: Let a_1, a_2, ..., a_{30} be an A.P., $S = \sum_{i=1}^{30} a_i$ and $T = \sum_{i=1}^{15} a_{(2i-1)}$. If $a_5 = 27$ and S − 2T = 75, then a_{10} is equal to: **JEE 2019**

    A. 52

    B. 57

    C. 47

    D. 42