

ASSIGNMENT - 1

EE24BTECH11019 - Dwarak A

SECTION B — JEE MAIN/AIEEE

- 1) If a_1, a_2, \dots, a_n are in H.P., then the expression $a_1a_2 + a_2a_3 + \dots + a_{n-1}a_n$ is equal to (2006)
 - a) $n(a_1 - a_n)$
 - b) $(n - 1)(a_1 - a_n)$
 - c) na_1a_n
 - d) $(n - 1)a_1a_n$
- 2) The sum of series $\frac{1}{2!} - \frac{1}{3!} + \frac{1}{4!} - \dots$ upto infinity is (2007)
 - a) $e^{-\frac{1}{2}}$
 - b) $e^{+\frac{1}{2}}$
 - c) e^{-2}
 - d) e^{-1}
- 3) In a geometric progression consisting of positive terms, each term equals the sum of the next two terms. Then the common ratio of its progression is equals (2007)
 - a) $\sqrt{5}$
 - b) $\frac{1}{2}(\sqrt{5} - 1)$
 - c) $\frac{1}{2}(1 - \sqrt{5})$
 - d) $\frac{1}{2}\sqrt{5}$
- 4) The first two terms of a geometric progression add up to 12. the sum of the third and the fourth terms is 48. If the terms of the geometric progression are alternately positive and negative, then the first term is (2008)
 - a) -4
 - b) -12
 - c) 12
 - d) 4
- 5) The sum to infinite term of the series $1 + \frac{2}{3} + \frac{6}{3^2} + \frac{10}{3^3} + \frac{14}{3^4} + \dots$ is (2009)
 - a) 3
 - b) 4
 - c) 6
 - d) 2
- 6) A person is to count 4500 currency notes. Let a_n denote the number of notes he counts in the n^{th} minute. If $a_1 = a_2 = \dots = a_{10} = 150$ and a_{10}, a_{11}, \dots are in an AP with common difference -2, then the time taken by him to count all notes is (2010)
 - a) 34 minutes
 - b) 125 minutes
 - c) 135 minutes
 - d) 24 minutes
- 7) 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 (2011)
 - a) 19 months
 - b) 20 months
 - c) 21 months
 - d) 18 months
- 8) Statement-1 : The sum of the series $1 + (1 + 2 + 4) + (4 + 6 + 9) + (9 + 12 + 16) + \dots + (361 + 380 + 400)$ is 8000.
Statement-2 : $\sum_{k=1}^n (k^3 - (k - 1)^3) = n^3$, for any natural number n . (2012)
 - a) Statement-1 is false, Statement-2 is true.
 - b) Statement-1 is true; Statement-2 is true; Statement-2 is a correct explanation for Statement-1
 - c) Statement-1 is true; Statement-2 is true; Statement-2 is not a correct explanation for Statement-1
 - d) Statement-1 is true; Statement-2 is false.
- 9) The sum of first 20 terms of the sequence $0.7, 0.77, 0.777, \dots$ is (JEE M 2013)
 - a) $\frac{7}{81}(179 - 10^{-20})$
 - b) $\frac{7}{9}(99 - 10^{-20})$
 - c) $\frac{7}{81}(179 + 10^{-20})$
 - d) $\frac{7}{9}(99 + 10^{-20})$
- 10) If $(10)^9 + 2(11)^1(10)^8 + 3(11)^2(10)^7 + \dots + 10(11)^9 = k(10)^9$, then k is equal to:

(JEE M 2014)

- a) 100
- b) 110
- c) $\frac{121}{10}$
- d) $\frac{441}{100}$

- 11) Three positive numbers form an increasing G.P. If the middle term in this G.P. is doubled, the new numbers are in A.P. then the common ratio of the G.P. is:

(JEE M 2014)

- a) $2 - \sqrt{3}$
- b) $2 + \sqrt{3}$
- c) $\sqrt{2} + \sqrt{3}$
- d) $3 + \sqrt{2}$

- 12) The sum of first 9 terms of the series. $\frac{1^3}{1} + \frac{1^3+2^3}{1+3} + \frac{1^3+2^3+3^3}{1+3+5} + \dots$ (JEE M 2015)

- a) 142
- b) 192
- c) 71
- d) 96

- 13) If m is the A.M. of two distinct real numbers l and n ($l, n > 1$) and G_1, G_2 and G_3 are three geometric means between l and n , then $G_1^4 + 2G_2^4 + G_3^4$ equals :

(JEE M 2015)

- a) $4lmn^2$
- b) $4l^2m^2n^2$
- c) $4l^2mn$
- d) $4lm^2n$

- 14) If the 2^{nd} , 5^{th} and 9^{th} terms of a non-constant A.P. are in G.P., then the common ratio of this G.P. is:

(JEE M 2016)

- a) 1
- b) $\frac{7}{4}$
- c) $\frac{8}{5}$
- d) $\frac{5}{4}$

- 15) If the sum of the first ten terms of the series $\left(1\frac{3}{5}\right)^2 + \left(2\frac{2}{5}\right)^2 + \left(3\frac{1}{5}\right)^2 + 4^2 + \left(4\frac{4}{5}\right)^2 + \dots$, is $\frac{16}{5}m$, then m is equal to :

(JEE M 2016)

- a) 100
- b) 99
- c) 102
- d) 101