

Assignment 1 - EE1030

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1 SECTION-B // JEE MAIN / AIEEE

1. If $1, \log_9(3^{1-x} + 2), \log_3(4 \cdot 3^x - 1)$ are in A.P then x equals [2002]

- a) $\log_3 4$ c) $1 - \log_4 3$
b) $1 - \log_3 4$ d) $\log_4 3$

2. l, m, n are the p^{th}, q^{th} and r^{th} term of a G.P. all positive, then $\begin{vmatrix} \log l & p & 1 \\ \log m & q & 1 \\ \log n & r & 1 \end{vmatrix}$ equals [2002]

- a) 1 c) 1
b) 2 d) 0

3. The value of $2^{\frac{1}{4}} \cdot 4^{\frac{1}{8}} \cdot 8^{\frac{1}{16}} \dots \infty$ is [2002]

- a) 1 c) $\frac{3}{2}$
b) 2 d) 4

4. Fifth term of a GP is 2, then the product of its 9 terms is [2002]

- a) 256 c) 1024
b) 512 d) none of these

5. Sum of infinite number of terms of a GP is 20 and sum of their square is 100. The common ratio of GP is [2002]

- a) 5 c) $\frac{8}{5}$
b) $\frac{3}{5}$ d) $\frac{1}{5}$

6. $1^3 - 2^3 + 3^3 - 4^3 + \dots + 9^3 =$ [2002]

- a) 425 c) 475
b) -425 d) -475

7. The sum of the series $\frac{1}{1 \cdot 2} - \frac{1}{2 \cdot 3} + \frac{1}{3 \cdot 4} \dots$ up to ∞ is equal to [2003]

- a) $\log_e \left(\frac{4}{e} \right)$ c) $\log_e 2 - 1$
 b) $2\log_e 2$ d) $\log_e 2$

8. If $S_n = \sum_{r=0}^n \frac{1}{nC_r}$ and $t_n = \sum_{r=0}^n \frac{r}{nC_r}$, then $\frac{t_n}{S_n}$ is equal to [2004]

- a) $\frac{2n-1}{2}$ c) $n-1$
 b) $\frac{1}{2}n-1$ d) $\frac{1}{2}n$

9. Let T_r be the r^{th} term of an A.P. whose first term is a and common difference is d . If for some positive integers $m, n, m \neq n, T_m = \frac{1}{n}$ and $T_n = \frac{1}{m}$, then $a-d$ equals [2004]

- a) $\frac{1}{m} + \frac{1}{n}$ c) $\frac{1}{mn}$
 b) 1 d) 0

10. The sum of the first n terms of the series $1^2 + 2 \cdot 2^2 + 3^2 + 2 \cdot 4^2 + 5^2 + 2 \cdot 6^2 + \dots$ is $\frac{n(n+1)^2}{2}$ when n is even. When n is odd the sum is [2004]

- a) $\left[\frac{n(n+1)}{2} \right]^2$ c) $\frac{n(n+1)^2}{2}$
 b) $\frac{n^2(n+1)}{2}$ d) $\frac{3n(n+1)}{2}$

11. The sum of series $\frac{1}{2!} + \frac{1}{4!} + \frac{1}{6!} + \dots$ is [2004]

- a) $\frac{(e^2-2)}{e}$ c) $\frac{n(n+1)^2}{2e}$
 b) $\frac{n^2(n+1)}{2}$ d) $\frac{(e^2-1)}{2}$

12. If the coefficients of $r^{th}, (r+1)^{th}$, and $(r+2)^{th}$ terms in the binomial expansion of $(1+y)^m$ are in A.P., then m and r satisfy the equation [2005]

- a) $m^2 - m(4r-1) + 4r^2 - 2 = 0$
 b) $m^2 - m(4r+1) + 4r^2 + 2 = 0$
 c) $m^2 - m(4r+1) + 4r^2 - 2 = 0$
 d) $m^2 - m(4r-1) + 4r^2 + 2 = 0$

13. If $x = \sum_{n=0}^{\infty} a^n, y = \sum_{n=0}^{\infty} b^n, z = \sum_{n=0}^{\infty} c^n$ where a, b, c are in A.P and $|a| < 1, |b| < 1, |c| < 1$ then x, y, z are in [2005]

- a) G.P.
 b) A.P.
 c) Arithmetic - Geometric Progression
 d) H.P.

14. The sum of the series $1 + \frac{1}{4 \cdot 2!} + \frac{1}{16 \cdot 4!} + \frac{1}{64 \cdot 6!} + \dots \infty$ is [2005]

a) $\frac{e-1}{\sqrt{e}}$
 b) $\frac{e+1}{\sqrt{e}}$

c) $\frac{e-1}{2\sqrt{e}}$
 d) $\frac{e+1}{2\sqrt{e}}$

15. Let $a_1, a_2, a_3 \dots$ be terms on A.P. If $\frac{a_1+a_2+\dots+a_p}{a_1+a_2+\dots+a_q} = \frac{p^2}{q^2}, p \neq q$, then $\frac{a_6}{a_{21}}$ equals [2006]

a) $\frac{41}{11}$
 b) $\frac{7}{2}$

c) $\frac{2}{7}$
 d) $\frac{11}{41}$