Assignment 1 - EE1030

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Section-B // JEE Main / AIEEE

1. If $1, \log_9\left(3^{1-x}+2\right), \log_3\left(4.3^x-1\right)$ are in A.P then x equals [2002]
   (a) $\log_1 4$
   (b) $1-\log_3 4$
   (c) $1-\log_4 3$
   (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
   (b) 2
   (c) 1
   (d) 0
3. The value of $2^{\frac{1}{4}}.4^{\frac{1}{8}}.8^{\frac{1}{16}}\ldots\infty$ is [2002]
   (a) 1
   (b) 2
   (c) 3/2
   (d) 4
4. Fifth term of a GP is 2, then the product of its 9 terms is [2002]
   (a) 256
   (b) 512
   (c) 1024
   (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
   (b) 3/5
   (c) 8/5
   (d) 1/5
6. $1^3-2^3+3^3-4^3+...+9^3=$ [2002]
   (a) 425
   (b) -425
   (c) 475
   (d) -475
7. The sum of the series $\frac{1}{1.2}-\frac{1}{2.3}+\frac{1}{3.4}\cdots$ up to ∞ is equal to [2003]
   (a) $\log_e\left(\frac{4}{e}\right)$
   (b) $2\log_e 2$
   (c) $\log_e 2-1$
   (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) $\frac{2n-1}{2}$
   (b) $\frac{1}{2}n-1$
   (c) $n-1$
   (d) $\frac{1}{2}n$
9. Let T_r be the rth 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) $\frac{1}{m}+\frac{1}{n}$
   (b) 1
   (c) $\frac{1}{mn}$
   (d) 0
10. The sum of the first n terms of the series $1^2+2.2^2+3^2+2.4^2+5^2+2.6^2+\cdots$ is $\frac{n(n+1)^2}{2}$ when n is even. When n is odd the sum is [2004]
    (a) $\left[\frac{n(n+1)}{2}\right]^2$
    (b) $\frac{n^2(n+1)}{2}$
    (c) $\frac{n(n+1)^2}{4}$
    (d) $\frac{3n(n+1)}{2}$
11. The sum of series $\frac{1}{2!}+\frac{1}{4!}+\frac{1}{6!}+\cdots$ is [2004]
    (a) $\frac{(e^2-2)}{e}$
    (b) $\frac{n^2(n+1)}{2}$
    (c) $\frac{n(n+1)^2}{2e}$
    (d) $\frac{(e^2-1)}{2}$
12. If the coefficients of rth, $(r+1)$th, and $(r+2)$th terms in the bionomial 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 $x = \sum\limits_{n=0}^{\infty} a^n$, $y = \sum\limits_{n=0}^{\infty} b^n$, $z = \sum\limits_{n=0}^{\infty} c^n$ 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 $1 + \frac{1}{4.2!} + \frac{1}{16.4!} + \frac{1}{64.6!} + \cdots \infty is$ [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 $a_1, a_2, a_3 \cdots$ be terms on A.P. If $\frac{a_1+a_2+\cdots a_p}{a_1+a_2+\cdots a_q} = \frac{p^2}{q^2}, p \neq q$, then $\frac{a_6}{a_{21}}$ equals [2006]
   - (a) $\frac{41}{11}$
   - (b) $\frac{7}{2}$
   - (c) $\frac{2}{7}$
   - (d) $\frac{11}{41}$