

1. $\lim_{x \rightarrow \infty} \left(1 + \frac{4}{x-1}\right)^{x+3}$ is equal to
 (1) e^4 (2) e^2
 (3) e^3 (4) e
2. If $\lim_{x \rightarrow \infty} \left(1 + \frac{a}{x} - \frac{4}{x^2}\right)^{2x} = e^3$, then 'a' is equal to
 (1) 2 (2) $\frac{3}{2}$
 (3) $\frac{1}{2}$ (4) $\frac{2}{3}$
3. The value of $\lim_{m \rightarrow \infty} \left(\cos \frac{x}{m}\right)^m$ is
 (1) 1 (2) e
 (3) e^{-1} (4) None of these
4. $\lim_{x \rightarrow 0} |x|^{\sin x} =$
 (1) 0 (2) does not exist
 (3) 1 (4) None of these
5. If $f(x) = \begin{cases} x + \frac{1}{2}, & x < 0 \\ 2x + \frac{3}{4}, & x \geq 0 \end{cases}$, then $\left[\lim_{x \rightarrow 0} f(x)\right]$ is (where $[\cdot]$ denotes the greatest integer function)
 (1) $\frac{1}{2}$ (2) $\frac{3}{4}$
 (3) does not exist (4) None of these
6. The value of $\lim_{x \rightarrow 0} \left(\left[\frac{100x}{\sin x} \right] + \left[\frac{99 \sin x}{x} \right] \right)$, (where $[x]$ represents greatest integral function less than or equal to x) is 99λ . Then the value of λ is
7. The value of $\lim_{x \rightarrow 1} (1 - x + [x-1] + [1-x])$, (where $[\cdot]$ denotes the greatest integer function) is:
 (1) -1 (2) Doesn't exist
 (3) 1 (4) None of these.
8. Let $f : R \rightarrow R$ be a positive increasing function with $\lim_{x \rightarrow \infty} \frac{f(3x)}{f(x)} = 1$. Then $\lim_{x \rightarrow \infty} \frac{f(2x)}{f(x)} =$
 (1) 1 (2) $\frac{2}{3}$
 (3) $\frac{3}{2}$ (4) 3
9. $\lim_{x \rightarrow \infty} \frac{x(\log x)^3}{1+x+x^2}$ equals
 (1) 0 (2) -1
 (3) 1 (4) Does not exist
10. If $\lim_{x \rightarrow 0} \frac{x(1+a \cos x) - b \sin x}{x^3} = 1$, then evaluate $|4a + b|$.