

CLASS XI SAMPLE PAPER MATHS

Time: 1hr

[10x2=20]
M.M: 50

(a): What is the value of the limit. $\lim_{n \rightarrow \infty} \frac{1}{2^n} \sum_{j=1}^n C_j^n$

(b): $\lim_{x \rightarrow 0} \frac{(1+x)^n - 1}{x} = ?$ (c): $\lim_{x \rightarrow 0} (k) = ?$ where k is a constant. [a, k, ka]

(d): $\lim_{x \rightarrow 1} \frac{x+1}{x^2-1} = ?$ [1, 2, 0, doesnotexist] (e): $\frac{d}{dx}(\sin x^\bullet) = ?$

(f): $\lim_{x \rightarrow 0} [x] + 1 = ?$ [1, 0, -1, doesnotexist]

(g): $\lim_{x \rightarrow 0} \frac{x}{|x|} = ?$ [0, 1, -1, doesnotexist]

(h): $\frac{d}{dx}(\ln e^{x^2+7}) = ?$ [2x, $\frac{1}{e^{x^2+7}}$, e^{x^2+7}]

(i): $\lim_{x \rightarrow \infty} \left(\frac{2}{3}\right)^x = ?$ [$\frac{2}{3}$, 1, 0, ∞]

(j): $y = \sin^2 e^x + \sin^2 \left(\frac{\pi}{2} + e^x\right)$, then $\frac{dy}{dx} = \text{-----}$

(2): Find the value of α if $\lim_{x \rightarrow \beta} \frac{\tan\left(\frac{x-\beta}{\alpha}\right) + \sin(x-\beta)}{x-\beta} = \frac{3}{2}$

(3): $\lim_{n \rightarrow \infty} \frac{1 + \frac{1}{2} + \frac{1}{2^2} + \dots + \frac{1}{2^n}}{1 + \frac{1}{3} + \frac{1}{3^2} + \dots + \frac{1}{3^n}}$ (4): $y = xy + \frac{x \sin^{-1} x}{\sqrt{1-x^2}}$, find $\frac{dy}{dx} = ?$

(5): (i) $\lim_{x \rightarrow \alpha} \frac{\tan a(x-\alpha)}{(x-\alpha)} = \frac{1}{2}$ (ii) $\lim_{x \rightarrow 1} \frac{5^x - 5}{(x-1) \log_e a} = 5$

(6): Find the derivative using first principle

(a): $y = \log(\sin x)$ or (b): $y = \cos \sqrt{x}$

(7): $y = \frac{x^2 \cos\left(\frac{\pi}{4}\right)}{\sin x}$, then find $\frac{dy}{dx} = ?$