

JEE MAIN

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EE24BTECH11033

1. Multiple Choice Questions

- 1) Let $f(x)$ be a polynomial function of second degree. If $f(1)=f(-1)$ and a, b, c are in A.P, then $f'(a), f'(b), f'(c)$ are in [2003]
 - a) Arithmetic-Geometric Progression
 - b) A.P
 - c) G.P
 - d) H.P
- 2) If $x=e^{y+e^{y+e^{y+\dots}}}$, $x > 0$, then $\frac{dy}{dx}$ is [2004]
 - a) $\frac{1+x}{x}$
 - b) $\frac{1}{x}$
 - c) $\frac{1-x}{x}$
 - d) $\frac{x}{1+x}$
- 3) The value of a for which the sum of the squares of the roots of the equation $x^2 - (a-2)x - a - 1 = 0$ assume the least value is [2005]
 - a) 1
 - b) 0
 - c) 3
 - d) 2
- 4) If the roots of the equation $x^2 - bx + c = 0$ be two consecutive integers, then $b^2 - 4c$ equals to [2005]
 - a) -2
 - b) 3
 - c) 2
 - d) 1
- 5) Let $f : R \rightarrow R$ be a differentiable function having $f(2) = 6, f'(2) = \left(\frac{1}{48}\right)$. Then $\lim_{x \rightarrow 2} \int_6^{f(x)} \frac{4t^3}{x-2} dt$ equals to [2005]
 - a) 24
 - b) 36
 - c) 12
 - d) 18
- 6) The set of points where $f(x) = \frac{x}{1+|x|}$ is differentiable is [2006]
 - a) $(-\infty, 0) \cup (0, \infty)$
 - b) $(-\infty, -1) \cup (-1, \infty)$
 - c) $(-\infty, \infty)$
 - d) $(0, \infty)$
- 7) If $x^m \cdot y^n = x + y^{m+n}$, then $\frac{dy}{dx}$ is [2006]
 - a) $\frac{y}{x}$
 - b) $\frac{x+y}{xy}$
 - c) xy
 - d) $\frac{x}{y}$
- 8) Let y be an implicit function of x defined by $x^{2x} - 2x^x \cot y - 1 = 0$. Then $y'(1)$ equals [2009]
 - a) 1
 - b) $\log 2$
 - c) $-\log 2$
 - d) -1
- 9) Let $f : (-1, 1) \rightarrow R$ be a differentiable function with $f(0) = -1$ and $f'(0) = 1$. Let $g(x) = (f(2f(x) + 2))^2$. Then $g'(0) =$ [2010]
 - a) -4
 - b) 0
 - c) -2
 - d) 4
- 10) $\frac{d^2x}{dy^2}$ equals: [JEE M 2013]
 - a) $-\left(\frac{d^2y}{dx^2}\right)^{-1} \left(\frac{dy}{dx}\right)^{-3}$
 - b) $\left(\frac{d^2y}{dx^2}\right) \left(\frac{dy}{dx}\right)^{-2}$
 - c) $-\left(\frac{d^2y}{dx^2}\right) \left(\frac{dy}{dx}\right)^{-3}$
 - d) $\left(\frac{d^2y}{dx^2}\right)^{-1}$
- 11) If $y = \sec(\tan^{-1} x)$, then $\frac{dy}{dx}$ at $x=1$ is equal to: [JEE M 2013]
 - a) $\frac{1}{\sqrt{2}}$
 - b) $\frac{1}{2}$
 - c) 1
 - d) $\sqrt{2}$
- 12) If g is the inverse of a function f and $f'(x) = \frac{1}{1+x^5}$, then $g'(x)$ is equal to: [JEE M 2014]
 - a) $\frac{1}{1+(g(x))^5}$
 - b) $1+(g(x))$
 - c) $1+x^5$
 - d) $5x^4$
- 13) If $x=-1$ and $x=2$ are extreme points of $f(x) = \alpha \log |x| + \beta x^2 + x$ then [JEE M 2014]
 - a) $\alpha = 2, \beta = -\frac{1}{2}$
 - b) $\alpha = 2, \beta = \frac{1}{2}$
 - c) $\alpha = -6, \beta = \frac{1}{2}$
 - d) $\alpha = -6, \beta = -\frac{1}{2}$
- 14) If for $x \in \left(0, \frac{1}{4}\right)$, the derivative of $\tan^{-1} \left(\frac{6x\sqrt{2}}{1-9x^3}\right)$ is $\sqrt{x} \cdot g(x)$, then $g(x)$ equals: [JEE M 2017]
 - a) $\frac{3}{1+9x^3}$
 - b) $\frac{3}{1-9x^3}$
 - c) $\frac{3x\sqrt{x}}{1-9x^3}$
 - d) $\frac{3x}{1-9x^3}$