JEE MAIN

Suraj Kolluru
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) Arthemetic-Geometric Progression
b) A.P
c) G.P
d) H.P

2) If x=$e^{y+e^{y+e^{y+---\infty}}}$,$x>0$, 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 $f:R\to R$ be a differentiable function having $f(2)=6,f'(2)=\left(\frac{1}{48}\right)$.Then $\lim_{x\to 2}\int_6^{f(x)}\frac{4t^3}{x-2}dt$ 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) $(-\infty,0)\bigcup(0,\infty)$ c) $(-\infty,\infty)$
b) $(-\infty,-1)\bigcup(-1,\infty)$ d) $0,\infty$

7) If $x^m.y^n=x+y^{m+n}$,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 $f:(-1,1)\to\mathbf{R}$ 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) $-\left(\frac{d^2y}{dx^2}\right)^{-1}\left(\frac{dy}{dx}\right)^{-3}$ c) $-\left(\frac{d^2y}{dx^2}\right)\left(\frac{dy}{dx}\right)^{-3}$
b) $\left(\frac{d^2y}{dx^2}\right)\left(\frac{dy}{dx}\right)^{-2}$ 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) $\frac{1}{\sqrt{2}}$ c) 1
b) $\frac{1}{2}$ 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) $\frac{1}{1+(g(x))^5}$ c) $1+x^5$
b) $1+(g(x))$ 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) $\alpha = 2, \beta = -\frac{1}{2}$ c) $\alpha = -6, \beta = \frac{1}{2}$
b) $\alpha = 2, \beta = \frac{1}{2}$ 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 $\sqrt{x}.g(x)$,then $g(x)$ equals: [JEE M 2017]

a) $\frac{3}{1+9x^3}$ c) $\frac{3x\sqrt{x}}{1-9x^3}$
b) $\frac{9}{1+9x^3}$ d) $\frac{3x}{1-9x^3}$