Q.11 If $y = \sqrt{\sin x + y}$ then prove that $\frac{dy}{dx} = \frac{\cos x}{1 - 2y}$ (4)

Q.12 If $5^x + 5^y = 5^{x+y}$ find $\frac{dy}{dx}$ (4)

Q.13 Diff: $\tan^{-1}\left[\frac{\sqrt{1+x^2} - \sqrt{1-x^2}}{\sqrt{1+x^2} + \sqrt{1-x^2}}\right]$ w.r.t $\cos^{-1}(x^2)$. (5)

Q.14 If $y = (\sin^{-1}x)^2$ then find $(1-x^2)\frac{d^2y}{dx^2} - x\frac{dy}{dx} = 2$ (5)

CLASS – 12th

SUBJECT – Maths

CHAPTER – Continuity & Differentiability

TIME: 1 HOUR

M.M: 30

Q.1 For what value of K, the function $f(x) = \begin{cases} 3x-8, & x \le 5 \\ 2k, & x > 5 \end{cases}$ is continous. (2)

Q.2 If $x = t^2$, $y = t^3$ find $\frac{d^2y}{dx^2}$ (2)

Q.3 Find the derivative of $f(x) = x|x|$ at $x = 0$. (2)

Q.4 If $f(x) = \begin{cases} \frac{k\cos x}{\pi - 2x}, & x \neq \frac{\pi}{2} \\ 3, & x = \frac{\pi}{2} \end{cases}$ is continous at $x = \frac{\pi}{2}$ then find the value of K. (2)

Q.5 If $y = a\sin nx + b\cos nx$ then find $\frac{d^2y}{dx^2}$ (2)

Q.6 Diff $y = \frac{\sin(ax+b)}{\cos(ax+d)}$ w.r.t x. (2)

Q.7 Check whether the function f defined by $f(x) = \begin{cases} x\sin\left(\frac{1}{x}\right), & x \neq 0 \\ 0, & x = 0 \end{cases}$ is continous at $x = 0$ or not (2)

Q.8. If $f(x) = \sqrt{\tan\sqrt{x}}$ then find $f'\left(\frac{\pi^2}{16}\right)$. (2)

Q.9 If $y = \sin^{-1}\left[\frac{2^{x+1}}{1+4^x}\right]$ Find $\frac{dy}{dx}$ (2)

Q.10 If $x = 10(t - \sin t)$, $y = 12(1 - \cos t)$ Find $\frac{dy}{dx}$ at $t = \frac{2\pi}{3}$. (2)