Name: _____	**Subject:** Mathematics	**Class:** 12th	**Time:** 80 minutes	Total Marks:	**40**
Chapter No.02	**MJDexpert.com**			Obtained marks	

Note: Please attempt any 10 short questions from Question 2. Also, attempt both parts of Question 3. Cutting and removal of any content is strictly prohibited.

Question.No.01:- Choose the correct answer. **(10x01=10)**

		(A)	(B)	(C)	(D)
1.	The instantaneous rate of change of "y" w.r.t " x" is given by	$\frac{dy}{dy}$	$\frac{dy}{dx}$	$\frac{dx}{dy}$	$\frac{dy}{dt}$
2.	If $y = x^n$ then $\frac{dy}{dx}$ is given by	xn^{n-1}	nx^{n+1}	nx^{n-1}	x^{n-1}
3.	If $f(x) = c^3$ then f' (x) =	$3c^3$	$3c^2$	0	3c
4.	The derivative of $x^6\ w.r.t\ x^3$ is given by	$6x^5$	$3x^2$	$2x^3$	x^3
5.	$\frac{d}{dx}\ [cot^{-1}x] =$	$\frac{1}{1+x^2}$	$\frac{1}{1+x^4}$	$-\frac{1}{1+x^2}$	None
6.	If f(x) = $\sin x$ then $y_2 =$	$3\cos 3x$	$9\cos 3x$	$-9\sin 3x$	None of these
7.	$\frac{dy}{dx} = \sin h\ 2x$	$2\cos h\ 2x$	$2\sin h\ 2x$	$-2\cos h\ 2x$	$-2\sin h\ 2x$
8.	$f\ (x) = f(0) + xf'(0) + x^2f''(0)$ .... Is called	Taylor series	Binomial series	Maclaurin series	None of these
9.	$\frac{d}{dx}(a^x) =$	$a^x \ln a$	$\frac{a^x}{\ln a}$	a^x	$\frac{\ln a}{a^x}$
10.	$\frac{d}{dx}[ln(\ln x)]$	$\frac{1}{x}$	$\frac{1}{x \ln a}$	$\frac{1}{x \ln x}$	$\frac{x}{\ln x}$

Question.No.02:-Solve all parts. **(02x10=20)**

i.	If $y = x^4 + 2x^2 + 2$ prove that $\frac{dy}{dx} = 4x\sqrt{y-1}$
ii.	ii) Differentiate w.r.t "x" $\frac{a+x}{a-x}$
iii.	Find $\frac{dy}{dx}$ of the following parametric equation $x = \theta + \frac{1}{\theta}$ and $y = \theta + 1$
iv.	Apply the Maclaurin series to prove that $e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \cdots$
v.	Differentiate w.r.t $\cos^{-1}\frac{x}{a}$
vi.	Find $\frac{dy}{dx}$ if $y = x\cos y$
vii.	Find $\frac{dy}{dx}$ $if\ y = (\ln x)^{\ln x}$
viii.	If $\tan y\ (1 + \tan x) = 1 - \tan x$ show that $\frac{dy}{dx} = -1$
ix.	Find f'(x) if $f(x) = e^{\sqrt{x}-1}$
x.	Find $\frac{dy}{dx}$ if $3x + 4y + 7 = 0$

Question.No.03:-Attempt All Questions. **(05x02=10)**

A.	Show that $\frac{dy}{dx} = \frac{y}{x}$ if $\frac{y}{x} = \tan^{-1}\frac{x}{y}$
B.	If $x = \sin\theta$, $y = \sin m\theta$ then show that $(1-x^2)y_2 - xy_1 + m^2y = 0$