

Name: _____					
Subject: Mathematics		Class: 12 <sup>th</sup>		Time: 80 minutes	
Total Marks: 40		Chapter No.03		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.

(01x10=10)

i.	$\int \frac{dx}{\sqrt{a^2 - x^2}} = :$	$\cos^{-1}\frac{x}{a} + c$	$\sin^{-1}\frac{x}{a} + c$	$\sin^{-1}\frac{a}{x} + c$	$\sin^{-1} x + c$
ii.	$\int \sin 3x dx = :$	$3\cos 3x + c$	$-3\cos 3x + c$	$\frac{\cos 3x}{3} + c$	$\frac{-\cos 3x}{3} + c$
iii.	$\int \frac{\sec^2 x}{\tan x} dx$ is equal to	$\ln  \tan x  + c$	$\ln  \cot x  + c$	$\cot x + c$	$\tan x + c$
iv.	If the lower limit is a constant and the upper limit is a variable, then the integral is a function of:	Upper limit	Lower limit	Constant	None of these
v.	If $\int a^x dx = ?$	$\frac{1}{a^x \ln a} + c$	$\frac{a^x}{\ln a} + c$	$\frac{\ln a}{a^x} + c$	$a^x \ln a + c$
vi.	$\int \frac{\sec^2 x}{\tan x} dx$ is equal to	$\ln  \tan x  + c$	$\ln  \cot x  + c$	$\cot x + c$	$\tan x + c$
vii.	$\int 0 dx = ?$	1	0	constant	x
viii.	$\int \ln x dx$	$x \ln x - x + c$	$\ln x - x + c$	$x \ln x + c$	None of these
ix.	$\int \frac{e^x}{e^x + 3} dx =$	$(e^x + 3)^2 + c$	$\ln(e^x + 3) + c$	$\ln(e^x) + c$	None
x.	Degree of the differential equation $(\frac{dy}{dx})^4 + (\frac{d^2y}{dx^2})^3 + (\frac{d^3y}{dx^3})^7$ is :	3	2	4	7

**Question.No.02:-** Attempt all parts.

(02x10=20)

i.	Evaluate $\int \frac{\sin \theta}{1 + \cos^2 \theta} dx$
ii.	Find $\delta y$ in the following case $y = x^2 + 2x$ when x changes from 2 to 1.8
iii.	Evaluate $\int \frac{e^{2x} + e^x}{e^x} dx$
iv.	Evaluate $\int \frac{1 - x^2}{1 + x^2} dx$
v.	Evaluate the integral $\int_0^{\frac{\pi}{3}} \cos^2 \theta \sin \theta d\theta$ .
vi.	Solve the differential equation $1 + \cos x \tan y \frac{dy}{dx} = 0$
vii.	Evaluate $\int e^{2x} [-\sin x + 2 \cos x] dx$
viii.	Evaluate $\int \frac{x^2}{4 + x^2} dx$
ix.	Evaluate $\int \cos x \left( \frac{\ln \sin x}{\sin x} \right) dx$
x.	Evaluate $\int \frac{1}{x \ln x} dx$

**Question.No.03:-** Attempt all questions:

(02x05=10)

A.	Find the area between x – axis and the curve $y = \sqrt{2ax - x^2}$ when $a > 0$ .
B.	Evaluate $\int \left( \frac{1 - \sin x}{1 - \cos x} \right) e^x dx$