BK BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS

SENIOR Secondary Co-Ed DAY CUM BOYS' RESIDENTIAL SCHOOL

PERIODIC TEST-1 2024

APPLIED MATHEMATICS (041)

Class: XII Science — Duration: 1 Hour

Date: 01/08/24 — MARKING SCHEME — Max. Marks: 25

Q No.	Answer	Scheme
1	A	Continuous everywhere but not differentiable at x=0
2	C	-1
3	B	e^x
4	D	a>1
5	C	
6	LHL= RHL Limit exists at x=1, therefore there is no point of discontinuity	
7	$x.\frac{dy}{dx}+y.1 = 0$ $\frac{dy}{dx} = -y/x = \frac{-y}{1/y} = -y^2$ $\frac{dy}{dx} + y^2 = 0$	
8	$\log Y= \sin^{-1}x \log x$ $\frac{dy}{dx} = y\left[\frac{sin^{-1}x}{x} + \frac{logx}{\sqrt{1-x^2}}\right]$ $\frac{dy}{dx} = xsin^{-1}x\left[\frac{sin^{-1}x}{x} + \frac{logx}{\sqrt{1-x^2}}\right]$	
9	Let r be the radius and C be the circumference of the circle at any time t. C= $2\pi r$ $\frac{dC}{dt} = 2\pi x 0.5 = \pi$cm/sec.	
10	Given that f(x) is continuous at x=3 $\lim_{x\to 3} f(x) = f(3)$ $\lim_{x\to 3} f(x) = k$ 3+3+6=k= 12.	
11	$\tan^{-1}\left(\frac{2+3tanx}{3-2tanx}\right)$ Divide numerator and denominator by 3 $\tan^{-1}\frac{2}{3}+\tan^{-1}(\tan x)$ $\tan^{-1}\frac{2}{3}+x$ $\frac{dy}{dx} = 0 + 1= 1$	

12	Given y= $\sin^{-1}x$ $$\frac{dy}{dx} = \frac{1}{\sqrt{1-x^2}}$$ $(1-x^2)\frac{d^2y}{dx^2} = \frac{x}{\sqrt{1-x^2}}$ $(1-x^2)\frac{d^2y}{dx^2} - x\frac{dy}{dx} = 0$
13	f'(x) = $3x^2$ -36x +96 0= f'(x) X= 4,8 Therefore, 0,4,8,9 are the points f(0) = 0 f(4) = 160 f(8) = 128 f(9) = 135 Minimum value is 0 at x=0