DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth **SUBJECT : MATHS**
DATE : **DPP NO. : 1**

Topic :-DIFFERENTITATION

1. If $y=(1+x)(1+x^2)(1+x^4)\ldots(1+x^{2^n})$, then the value of $\frac{dy}{dx}$ at $x=0$ is
   a) 0 b) -1 c) 1 d) None of these

2. If $\sqrt{1-x^2}+\sqrt{1-y^2}=a(x-y)$, then $\frac{dy}{dx}$ equals
   a) $\sqrt{(1-x^2)(1-y^2)}$ b) $\sqrt{\frac{1-y^2}{1-x^2}}$ c) $\sqrt{\frac{1-x^2}{1-y^2}}$ d) None of these

3. The derivative of e^{x^3} with respect to $\log x$ is
   a) e^{x^3} b) $3x^2 2e^{x^3}$ c) $3x^3e^{x^3}$ d) $3x^2e^{x^3}+3x^2$

4. The rate of change of $\sqrt{(x^2+16)}$ with respect to $\frac{x}{x-1}$ at $x=3$ is
   a) 2 b) $\frac{11}{5}$ c) $-\frac{12}{5}$ d) -3

5. If $x=\log(1+t^2)$ and $y=t-\tan^{-1}t$. Then, $\frac{dy}{dx}$ is equal to
   a) e^x-1 b) t^2-1 c) $\frac{\sqrt{e^x-1}}{2}$ d) e^x-y

6. If $y=(1+x)(1+x^2)(1+x^4)\ldots(1+x^{2^n})$, then the value of $\left(\frac{dy}{dx}\right)_{x=0}$ is
   a) 0 b) -1 c) 1 d) 2

7. If $f(x)=(1-x)^n$, then the value of $f(0)+f'(0)+\frac{f''(0)}{2!}+\ldots\frac{f^n(0)}{n!}$, is
   a) 2^n b) 0 c) 2^{n-1} d) None of these

8. If $f(x)=(\log_{\cot x}\tan x)(\log_{\tan x}\cot x)^{-1}+\tan^{-1}\frac{4x}{4-x^2}$, then $f'(2)$ is equal to
   a) $\frac{1}{2}$ b) $-\frac{1}{2}$ c) 1 d) -1

9. If $y=\cos^2\frac{3x}{2}-\sin^2\frac{3x}{2}$, then $\frac{d^2y}{dx^2}$ is
   a) $-3\sqrt{1-y^2}$ b) $9y$ c) $-9y$ d) $3\sqrt{1-y^2}$

10. If $f(x)=\log_x(\log_e x)$, then $f'(x)$ at $x=e$ is equal to
    a) 1 b) 2 c) 0 d) $\frac{1}{e}$

11. If $f(x) = \cos^{-1}\left\{\frac{1+(\log_e x)^2}{1+(\log_e x)^2}\right\}$, then $f'(e)$

a) Does not exist b) Is equal to $\frac{2}{e}$ c) Is equal to $\frac{1}{e}$ d) Is equal to 1

12. If $f(x) = 1 + nx + \frac{n(n-1)}{2}x^2 + \frac{n(n-1)(n-2)}{6}x^3 + \ldots + x^n$, then $f''(1)$ is equal to

a) $n(n-1)2^{n-1}$ b) $(n-1)2^{n-1}$ c) $n(n-1)2^{n-2}$ d) $n(n-1)2^n$

13. If $2^x + 2^y = 2^{x+y}$, then $\frac{dy}{dx}$ is equal to

a) $\frac{(2^x+2^y)}{(2^x-2^y)}$ b) $\frac{(2^x+2^y)}{(1+2^{x+y})}$ c) $2^{x-y}\left(\frac{2^y-1}{1-2^x}\right)$ d) $\frac{2^{x+y}-2^x}{2^y}$

14. If $2x^2 - 3xy + y^2 + x + 2y - x = 0$, then $\frac{dy}{dx} =$

a) $\frac{3y-4x-1}{2y-3x+2}$ b) $\frac{3y+4x+1}{2y+3x+2}$ c) $\frac{3y-4x+1}{2y-3x-2}$ d) $\frac{3y-4x+1}{2y+3x+2}$

15. If $\sin y + e^{-x\cos y} = e$, then $\frac{dy}{dx}$ at $(1, \pi)$ is

a) $\sin y$ b) $-x\cos y$ c) e d) $\sin y - x\cos y$

16. $\frac{d}{dx}\left[\tan^{-1}\left(\frac{a-x}{1+ax}\right)\right]$ is equal to

a) $-\frac{1}{1+x^2}$ b) $\frac{1}{1+a^2} - \frac{1}{1+x^2}$ c) $\frac{1}{1+\left(\frac{a-x}{1+ax}\right)^2}$ d) $\frac{-1}{\sqrt{1-\left(\frac{a-x}{1+ax}\right)^2}}$

17. If $y = \tan^{-1}\left(\frac{a\cos x - b\sin x}{b\cos x + a\sin x}\right)$, then $\frac{dy}{dx}$ is equal to

a) 2 b) -1 c) $\frac{a}{b}$ d) $\frac{b}{a}$

18. Let $y = x^{x^{x\ldots}}$, then $\frac{dy}{dx}$ is equal to

a) yx^{y-1} b) $\frac{y^2}{x(1-y\log x)}$ c) $\frac{y}{x(1+y\log x)}$ d) None of these

19. If $x^x y^y z^z = c$, then $\frac{\partial z}{\partial x}$ is equal to

a) $\left(\frac{1+\log x}{1+\log z}\right)$ b) $-\left(\frac{1+\log x}{1+\log z}\right)$ c) $\left(\frac{1+\log z}{1+\log x}\right)$ d) None of these

20. If $y = \sec^{-1}\left(\frac{\sqrt{x}+1}{\sqrt{x}-1}\right) + \sin^{-1}\left(\frac{\sqrt{x}-1}{\sqrt{x}+1}\right)$, then $\frac{dy}{dx}$ equals

a) 1 b) 0 c) $\frac{\sqrt{x}+1}{\sqrt{x}-1}$ d) $\frac{\sqrt{x}-1}{\sqrt{x}+1}$