DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth **SUBJECT : MATHS**
DATE : **DPP NO. : 3**

Topic :-DIFFERENTITATION

1. If $\sec\left(\frac{x^2-y^2}{x^2+y^2}\right)=e^a$,then$\frac{dy}{dx}$ is equal to

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

2. If $y=\frac{a+bx^{3/2}}{x^{5/4}}$and $y'=0$ at $x=5$, then the ratio $a:b$ is equal to

a) $\sqrt{5}:1$ b) 5:2 c) 3:5 d) 1:2

3. If $f(x)=be^{ax}+ae^{bx}$, then $f''(0)$ is equal to

a) 0 b) $2ab$ c) $ab(a+b)$ d) ab

4. If $x^m y^n=(x+y)^{m+n}$, then $(dy/dx)_{x=1,\,y=2}$ is equal to

a) $1/2$ b) 2 c) $2m/n$ d) $m/2n$

5. If $f(x)$ and g (x) are two functions with $g(x)=x-\frac{1}{x}$ and $fog\,(x)=x^3-\frac{1}{x^3}$,then$f'(x)$ is

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

6. If a curve is given by $x=a\cos t+\frac{b}{2}\cos 2t$and $y=a\sin t+\frac{b}{2}\sin 2t$, then the points for which $\frac{d^2y}{dx^2}=0$ are given by

a) $\sin t=\frac{2\,a^2+b^2}{3ab}$ b) $\cos t=-\frac{a^2+b^2}{3ab}$ c) $\tan t=a/b$ d) None of these

7. Let f be a twice differentiable function such that $f''(x)=-f(x)$ and $f'(x)=g(x)$.If $h'(x)=[f(x)^2+g(x)^2]h(1)=8andh(0)=2$, then $h(2)$ is equal to

a) 1 b) 2 c) 3 d) None of these

8. If $y=\log x^x$, then the value of $\frac{dy}{dx}$ is

a) $x^x\,(1+\log x)$ b) $\log(ex)$ c) $\log\left(\frac{e}{x}\right)$ d) $\log\left(\frac{x}{e}\right)$

9. If $f''(x)=-f(x)$, where $f(x)$is a continuous double differentiable function and $g(x)=f'(x)$.If $F(x)=\left(f\left(\frac{x}{2}\right)\right)^2+\left(g\left(\frac{x}{2}\right)\right)^2$and $F(5)=5$ then $F(10)$ is

a) 0 b) 5 c) 10 d) 25

10. If $y = \sqrt{\sin x + \sqrt{\sin x + \sqrt{\sin x + \ldots \infty}}}$, then $\frac{dy}{dx}$ is equal to

a) $\frac{\cos x}{2y-1}$ b) $\frac{-\cos x}{2y-1}$ c) $\frac{\sin x}{1-2y}$ d) $\frac{-\sin x}{1-2y}$

11. If $y = x^2 e^{mx}$, where m is a constant, then $\frac{d^3y}{dx^3}$ is equal to

a) $me^{mx}(m^2x^2 + 6mx + 6)$ b) $2m^3 x e^{mx}$
c) $me^{mx}(m^2x^2 + 2mx + 2)$ d) None of these

12. If $x^2 + y^2 = t - \frac{1}{t}$ and $x^4 + y^4 = t^2 + \frac{1}{t^2}$, then $\frac{dy}{dx}$ is equal to

a) $\frac{1}{x^2y^3}$ b) $\frac{1}{xy^3}$ c) $\frac{1}{x^2y^2}$ d) $\frac{1}{x^3y}$

13. If $x = \sin^{-1}(3t - 4t^3)$ and $y = \cos^{-1}(\sqrt{1-t^2})$, then $\frac{dy}{dx}$ is equal to

a) $1/2$ b) $2/5$ c) $3/2$ d) $1/3$

14. If $f(x) = \sqrt{1 - \sin 2x}$, then $f'(x)$ equals

a) $-(\cos x + \sin x)$, for $x \in (\pi/4, \pi/2)$
b) $\cos x + \sin x$, for $x \in (0, \pi/4)$
c) $-(\cos x + \sin x)$, for $x \in (0, \pi/4)$
d) $\cos x - \sin x$, for $x \in (\pi/4, \pi/2)$

15. Derivative of $\sin x$ w.r.t. $\cos x$ is

a) $\cos x$ b) $\cot x$ c) $-\cot x$ d) $\tan x$

16. The derivative of $F[f\{\phi(x)\}]$ is

a) $F'[f\{\phi(x)\}]$ b) $F'[f\{\phi(x)\}]f\{\phi(x)\}$
c) $F'[f\{\phi(x)\}]f'\{\phi(x)\}$ d) $F'[f\{\phi(x)\}]f'\{\phi(x)\}\phi'(x)$

17. If $x\sqrt{1+y} + y\sqrt{1+x} = 0$, then $\frac{dy}{dx}$ is equal to

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

18. If $\sec\left(\frac{x^2-y^2}{x^2+y^2}\right) = e^a$, then $\frac{dy}{dx}$ is equal to

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

19. If $f(x) = \log_a(\log_a x)$, then $f'(x)$ is

a) $\frac{\log_a e}{x \log_e x}$ b) $\frac{\log_e a}{x \log_a x}$ c) $\frac{\log_e a}{x}$ d) $\frac{x}{\log_e a}$

20. If $y = \log^n x$, where $\log^n$ means log log log…(repeated n times), then $x \log x \log^2 x \log^3 x \ldots \log^{n-1} x \log^n x \frac{dy}{dx}$ is equal to

a) $\log x$ b) $\log^n x$ c) $\frac{1}{\log x}$ d) 1