

## UNIT-VI

### DIFFERENTIATION

1. Find the differential coefficient of  $\log e^x$  w.r.t.x.
2. Find the differential coefficient of  $e^x$  w.r.t.x.
3. Find the differential coefficient of  $x^n$  w.r.t.x.
4. If  $y = x^5 + 3x^3 + 6x + 10$ , then find  $\frac{dy}{dx}$
5. If  $y = x^3 \cdot \log x$  then find  $\frac{dy}{dx}$
6. If  $y = (x^4 + 1)x^3$  then find  $\frac{dy}{dx}$ .
7. Find the differential coefficient of  $\frac{x}{\log x}$  w.r.t.x.
8. Find :  $\frac{d}{dx} \left( \frac{x+1}{x-1} \right)$ .
9. If  $y = \frac{x^2 + x + 1}{x^2 - x + 1}$  then find  $\frac{dy}{dx}$
10. If  $y = (1 + 2x^2)(3x^2 - 1)$  then find  $\frac{dy}{dx}$ .
11. If  $y = (x+a)(x+b)$ , then find the value of x for which  $\frac{dy}{dx} = 0$
12. Differentiate with respect to x :  $\frac{(x+4)(x-3)}{x}$
13. If  $y = (x^4 + 3x^2)^2$  then find  $\frac{dy}{dx}$ .
14. If  $y = \sqrt{1+x^3}$  then find  $\frac{dy}{dx}$ .
15. Differentiate with respect to x :  $(1+x^3)^7$
16. If  $y = \sqrt{5+2x-3x^3}$  then find  $\frac{dy}{dx}$ .

- 17 If  $x^2 - y^2 = 7$  then find  $\frac{dy}{dx}$ .
- 18 If  $ax^2 + 2bxy + by^2 = 1$  then find  $\frac{dy}{dx}$ .
- 19 If  $\log xy = x^2 + y^2$  then find  $\frac{dy}{dx}$ .
- 20 If  $y = \sqrt{x}\sqrt{x}\sqrt{x+\dots\dots\dots}$  to  $\infty$  prove that  $\frac{dy}{dx} = \frac{1}{2y-1}$
- 21 Find  $\frac{dy}{dx}$  if  $xy + x^2y^2 = c$ .
- 22 Find  $\frac{dy}{dx}$  if  $x^m y^n = (x-y)^{m+n}$
- 23 If  $y = x^{\log x}$ , then find  $\frac{dy}{dx}$
- 24 If  $y = \log_7 x$ , then find  $\frac{dy}{dx}$
- 25 If  $y = a^x + x^a$ , then find  $\frac{dy}{dx}$
- 26 If  $y = e^{x^2}$  then find  $\frac{dy}{dx}$
- 27 If  $y = e^{7\log x}$ , then find  $\frac{dy}{dx}$
- 28 If  $y = x^y$ , then find  $\frac{dy}{dx}$
- 29 If  $xy = x^3 + y^3$ , then find  $\frac{dy}{dx}$
- 30 If  $y = (x^2 + 5x + 1)^5$ , then find  $\frac{dy}{dx}$

