

## Topic :-DIFFERENTIATION

1. If  $y = \sin px$  and  $y_n$  is the  $n$ th derivative of  $y$ , then  $\begin{vmatrix} y & y_1 & y_2 \\ y_3 & y_4 & y_5 \\ y_6 & y_7 & y_8 \end{vmatrix}$  is equal to
  - a) 1
  - b) 0
  - c) -1
  - d) None of these
  
2. If  $y = 1 - x + \frac{x^2}{2!} - \frac{x^3}{3!} + \frac{x^4}{4!} - \dots$ , then  $\frac{d^2y}{dx^2}$  is equal to
  - a)  $x$
  - b)  $-x$
  - c)  $-y$
  - d)  $y$
  
3. If  $f(4) = 4, f'(4) = 1$ , then  $\lim_{x \rightarrow 4} \frac{2 - \sqrt{f(x)}}{2 - \sqrt{x}}$  is equal to
  - a) -1
  - b) 1
  - c) 2
  - d) -2
  
4. If  $x = \frac{2at}{1+t^3}$  and  $y = \frac{2at^2}{(1+t^3)^2}$ , then  $\frac{dy}{dx}$  is
  - a)  $ax$
  - b)  $a^2x^2$
  - c)  $\frac{x}{a}$
  - d)  $\frac{x}{2a}$
  
5.  $y = e^{a \sin^{-1} x} \Rightarrow (1-x^2)y_{n+2} - (2n+1)xy_{n+1}$  is equal to
  - a)  $-(n^2 + a^2)y_n$
  - b)  $(n^2 - a^2)y_n$
  - c)  $(n^2 + a^2)y_n$
  - d)  $-(n^2 - a^2)y_n$
  
6. If  $\sec\left(\frac{x-y}{x+y}\right) = a$ , then  $\frac{dy}{dx}$  is
  - a)  $\frac{y}{x}$
  - b)  $-\frac{y}{x}$
  - c)  $\frac{x}{y}$
  - d)  $-\frac{x}{y}$
  
7. If  $y = x + x^2 + x^3 + \dots$ , where  $|x| < 1$ , then for  $|y| < 1, \frac{dx}{dy}$  is equal to
  - a)  $y + y^2 + y^3 + \dots$
  - b)  $1 - y + y^2 - y^3 + \dots$
  - c)  $1 - 2y + 3y^2 - \dots$
  - d)  $1 + 2y + 3y^2 + \dots$
  
8.  $\frac{d}{dx} \sqrt{\frac{1 - \sin 2x}{1 + \sin 2x}}$  is equal to
  - a)  $\sec^2 x$
  - b)  $-\sec^2\left(\frac{\pi}{4} - x\right)$
  - c)  $\sec^2\left(\frac{\pi}{4} + x\right)$
  - d)  $\sec^2\left(\frac{\pi}{4} - x\right)$
  
9. Derivative of  $\log_{10} x$  with respect to  $x^2$  is
  - a)  $2x^2 \log_e 10$
  - b)  $\frac{\log_{10} e}{2x^2}$
  - c)  $\frac{\log_e 10}{2x^2}$
  - d)  $x^2 \log_e 10$

