## HERAMB COACHING CLASSES

Yogeshwar Towers, Katemanivali, Kalyan (East)

Date: 20/09/18

XII/Mathematics

Marks: 30

**Duration:1 Hour** 

## ATTEMPT ANY SIX

**Q.1.** Find  $\frac{dy}{dx}$  for the following.

1) 
$$y = \sin^{-1}\left(\frac{1-x^2}{1+x^2}\right)$$

2) 
$$y = tan^{-1} \left( \frac{6x}{1 - 5x^2} \right)$$

**Q.2.** Differentiate the following functions in their respective domains with respect to  $\boldsymbol{x}$ 

1) 
$$y = \frac{(2x-3)^{1/4}}{(3x+1)^{1/3}(2-x)^{7/2}}$$

$$2) y = (\sin x)^x + x \cdot \sin x$$

**Q.3.** If 
$$x^y = e^{x-y}$$
 then show that  $\frac{dy}{dx} = \frac{\log x}{(1+\log x)^2}$ 

**Q.4.** If 
$$x^{7}y^{9} = (x + y)^{16}$$
, then show that  $\frac{dy}{dx} = \frac{y}{x}$ 

**Q.5.** Differentiate  $e^{4x+5}$  with respect to  $e^{3x}$ 

**Q.6.** If 
$$x = e^{\sin t}$$
,  $y = e^{\cos t}$ , then show that  $\frac{dy}{dx} = -\frac{y}{x} \cdot \frac{\log x}{\log y}$ 

**Q.7.** If 
$$x = \frac{4t}{1+t^2}$$
 and  $y = 3(\frac{1-t^2}{1+t^2})$ , then show that  $\frac{dy}{dx} = -\frac{9}{4} \cdot \frac{x}{y}$