

Assignment - 3

X - Normal Distribution .

$$= N(\mu, \sigma^2)$$

$$\therefore f(x) = \frac{1}{\sqrt{2\pi\sigma^2}} \exp\left(-\frac{(x-\mu)^2}{2\sigma^2}\right)$$

$$\textcircled{S} R_X \equiv (-\infty, \infty)$$

$$y = g(x) = e^x$$

$g(x)$ is strictly increasing . and $R_Y \equiv (0, \infty)$

$$g^{-1}(y) = \ln y .$$

$$\frac{dg^{-1}(y)}{dy} = \frac{1}{y}$$

$$\therefore f(y) = \begin{cases} \frac{1}{\sqrt{2\pi\sigma^2}} \exp\left(-\frac{(\ln y - \mu)^2}{2\sigma^2}\right) \times \frac{1}{y} ; & \text{if } y \in (0, \infty) \\ 0 ; & \text{else} . \end{cases}$$

Ans