#### 1

# **ASSIGNMENT 2**

## MANIKANTA VALLEPU - AI20BTECH11014

Download all python codes from

https://github.com/manik2255/AI1103-PROBABILITY-AND-RANDOM-VARIABLES/blob/main/ASSIGNMENT 2/ ASSIGNMENT 2 GRAPH.py

and latex-tikz codes from

https://github.com/manik2255/AI1103-PROBABILITY-AND-RANDOM-VARIABLES/blob/main/ASSIGNMENT 2/ ASSIGNMENT 2.tex

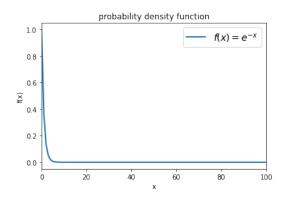
### 1 Problem.GATE.14

A continuous random variable X has a probability density function  $f(x) = e^{-x}, 0 < x < \infty$ . Then P(X > x)1) is

#### 2 Solution

Given,

$$f(x) = e^{-x}, 0 < x < \infty$$
 (2.0.1)



We have to find Pr(X > 1),

$$\Pr(X > 1) = \int_{1}^{\infty} f(x) dx \qquad (2.0.2)$$

Using (2.0.1) in (2.0.2)

$$\Pr(X > 1) = \int_{1}^{\infty} e^{-x} dx$$
 (2.0.3)

$$= [-e^{-x}]_1^{\infty} \tag{2.0.4}$$

$$= (-e^{-\infty}) - (-e^{-1})$$
 (2.0.5)

$$= (-e^{-\infty}) - (-e^{-1})$$
 (2.0.5)  
=  $e^{-1}$  (2.0.6)

$$\implies \Pr(X > 1) = \frac{1}{e} \tag{2.0.7}$$