

KING FAHD UNIVERSITY OF PETROLEUM AND MINERALS
ELECTRICAL ENGINEERING DEPARTMENT

EE 315

Quiz #1

Name: Solution
 ID#: _____
 Section No: _____

Q1: In a box there are 100 resistors having resistance and tolerance as shown in the table below. Let a resistor be selected from the box and assume that all resistors are equally likely.

- What is the probability of drawing a resistor of $50\ \Omega$ with 2% tolerance?
- What is the probability of drawing a resistor of $50\ \Omega$ or having 2% tolerance?
- What is the probability of drawing a resistor of $50\ \Omega$ given that the resistor has 2% tolerance?
- What is the probability of not drawing a resistor of $100\ \Omega$ with 5% tolerance?

Resistance (Ω)	Tolerance		Total
	2%	5%	
20	10	16	26
50	25	14	39
100	29	6	35
Total	64	36	100

$$a) P(50\ \Omega \cap 2\%) = \frac{25}{100} = \underline{0.25}$$

$$b) P(50\ \Omega \cup 2\%) = P(50\ \Omega) + P(2\%) - P(50\ \Omega \cap 2\%)$$

$$= \frac{39}{100} + \frac{64}{100} - \frac{25}{100}$$

$$= \underline{0.78}$$

$$c) P(50\ \Omega | 2\%) = \frac{P(50\ \Omega \cap 2\%)}{P(2\%)}$$

$$= \frac{25/100}{64/100}$$

$$= \underline{0.3906}$$

$$d) P(\overline{100\ \Omega \cap 5\%}) = 1 - P(100\ \Omega \cap 5\%)$$

$$= 1 - \frac{6}{100}$$

$$= \frac{94}{100}$$

$$= \underline{0.94}$$