Name: SOLUTIONS

Counting Assignment

Question 1. From a standard 52 card deck of cards, 5 cards are drawn. Compute the probability of the following:

a. *(2 marks)* Drawing 5 cards of the same suit.

$$\frac{{}_4C_1 \cdot {}_{13}C_5}{{}_{52}C_5} = \frac{5148}{2{,}598{,}960} = 0.00198$$

b. *(2 marks)* Drawing 1 black card only.

$$\frac{{}_{26}C_1 \cdot {}_{26}C_4}{{}_{52}C_5} = \frac{388{,}700}{2{,}598{,}960} = 0.150$$

c. *(3 marks)* Drawing at least 2 hearts.

$$\frac{\left[{}_{13}C_2\ {}_{39}C_3\right] + \left[{}_{13}C_3\ {}_{39}C_2\right] + \left[{}_{13}C_4\ {}_{39}C_1\right] + \left[{}_{13}C_5\ {}_{39}C_0\right]}{{}_{52}C_5}$$

$$= \frac{712{,}842 + 211{,}926 + 27{,}885 + 1287}{2{,}598{,}960} = \frac{953{,}940}{2{,}598{,}960} = 0.367$$

d. *(3 marks)* Drawing 5 "consecutive" cards (A 2 3 4 5 or 5 6 7 8 9 or 9 10 J Q K etc)

$$\frac{9 \cdot {}_4C_1 \cdot {}_4C_1 \cdot {}_4C_1 \cdot {}_4C_1 \cdot {}_4C_1}{{}_{52}C_5}$$

$$= \frac{9216}{2{,}598{,}960} = 0.00355$$