

King Fahd University of Petroleum and Minerals
 College of Computer Science and Engineering
 Information and Computer Science Department

ICS 253-01: Discrete Structures I
 Summer 2012-2013
 Quiz#6, Wednesday July 24, 2013.

Name:

ID#:

1. (5 points) What is the probability that a five-card poker hand does not contain the queen of hearts?

2 $P(\text{poker hand with Queen of Hearts}) = 1 \frac{\binom{51}{4}}{\binom{52}{5}} .$

3 $\therefore \text{The probability of not containing it} = 1 - \frac{\binom{51}{4}}{\binom{52}{5}} .$

2. (5 points) In a super lottery, players win a fortune if they choose the eight numbers selected by a computer from the positive integers not exceeding 100. What is the probability that a player wins this super lottery?

5 $\frac{1}{\binom{100}{8}}$

3. (5 points) What is the probability of 1 preceding a 4 when we randomly select a permutation of $\{1, 2, 3, 4\}$?

1423, 1432, 1234, 1243, 1324, 1342, 2134, 2143, 2314, 2341, 2413, 2431
 3124, 3142, 3214, 3241, 3412, 3421, 4123, 4132, 4213, 4231, 4312, 4321

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$$\frac{12}{24} = \frac{1}{2} \quad 3$$

4. (5 points) Show that if E and F are events, then $p(E \cap F) \geq p(E) + p(F) - 1$.

$$\begin{aligned} \text{Since } 1 &\geq P(E \cup F) = P(E) + P(F) - P(E \cap F) \\ \therefore P(E \cap F) &\geq P(E) + P(F) - 1. \end{aligned}$$

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