STAT 375 Probability Theory **Quiz 6** **October 25, 2024**

Your Name:

Duration of the Quiz is 20 minutes. There are four problems, worth 20 points, and an extra credit problem, worth 1 point. Show all your work for full credit. Books, notes etc. are prohibited.

1. The probability that a patient recovers from a stomach disease is .8. Suppose 20 people are known to have contracted this disease. What is the probability that

   (a) exactly 14 recover?

   (b) at least 10 recover?

   (c) at least 14 but not more than 18 recover?

   (d) at most 16 recover?

2. Cards are dealt at random and without replacement from a standard 52 card deck. What is the probability that the second king is dealt on the fifth card?

3. A warehouse contains ten printing machines, four of which are defective. A company selects five of the machines at random, thinking all are in working condition. What is the probability that all five of the machines are non-defective?

4. Suppose a fair die is tossed three times. Let X be the largest of the three faces that appear. Find $p_X(k)$.

Extra Credit Problem: Suppose die one has spots $1, 2, 2, 3, 3, 4$ and die two has spots $1, 3, 4, 5, 6, 8$. If both dice are rolled, what is the sample space? Let X be the total spots showing. Is the pdf for X the same as for normal dice?