



Prince Sultan University
Department of Mathematical Sciences
STAT 101 – Third Examination
26 May 2010

Time allowed: 90 minutes
Maximum points: 40 points

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1. (2 points) Determine whether the following distribution represents a probability distribution. State why?

x	0	2	4	6
$p(x)$	-1.0	1.5	0.3	0.2

2. (4 points) A ski resort loses \$70,000 per season when it does not snow very much and makes \$250,000 profit when it does snow a lot. The probability that it will snow at least 75 inches (i.e., a good season) is 40%. Find the expectation for the profit.
3. (4 points) A student takes a multiple-choice quiz with five choices for each question. If there are 10-que
4. /stions in the quiz, find the probability of guessing at least 6 correct out of 10.
5. (4 points) For the following probability distribution, find the probability that x falls into the interval $\mu \pm 2\sigma$.

x	5	6	7	8	9
$p(x)$	0.2	0.25	0.38	0.1	0.07

6. (4 points) Use the cumulative binomial table for $n = 11$ and $p = 0.6$ to find the probabilities of these events:
(a) Exactly seven successes
(b) Between three and eight successes (exclusive)
7. (4 points) If electricity power failures occur according to a Poisson distribution with an average of 3 failures every twenty weeks, calculate the probability that there will not be more than one failure during a particular week.
8. (3 points) Suppose that 7 balls are selected at random without replacement from a box containig 5 red balls and 10 blue balls. If x denotes the number of red balls in the sample, what are the mean and the variance of x ?
9. (4 points) Find the area under the standard normal curve for the following, using the z -table.

(a) Between $z = -0.56$ and $z = 0$.

(b) To the right of $z = -1.33$.

10.(4 point) A company pays its employees an average wage of \$3.25 an hour with a standard deviation of 60 cents. If the wages are approximately normally distributed, determine the minimum wage of the highest 5%.

11. (4 points) Let x be a normally distributed random variable with a mean of 14 and a standard deviation of 1.5. Find the probability that x lies between 12.75 and 14.65.

12. (3 point) Let x be a binomial random variable with $n = 100$ and $p = 0.05$. Use the Poisson approximation to calculate $P(x = 10)$.
