Prince Sultan University
Stat 101 (Final exam)
Thursday June 12, 2008
Dr. Bader Abid
Time allowed : 120minutes

Name : ……

Student ID # ……

Section : ---------- (11-11: 50 section 236 1: 10 – 2;00 section 237)

. This exam has 10 questions, some with parts. Total 6 pages. Max score 80.

. You Must show all your work to get full credit.

. You may use back of pages for extra space, please indicate question number.

.Non programmable scientific calculators are allowed.

.You may not borrow a calculator from any one during exam.

. No notes, notebooks or extra pages are allowed on your desk.

. There should be NO talking or looking at other's papers during exam.

. Turn your mobile phone off. No use of mobile phone during exam allowed.

. A blank page is provided for extra space or doing rough work.

Q1 (10 pts) State True or False.

(a). Two classes, one with 15 students and the other with 25 students, took the same test and averaged 85 points and 75 points, respectively. If the two classes were combined, the overall average score of the 40 students would be 80 points.

(b). The mode is the sum of a data set's minimum plus maximum values, divided by 2.

(c). A local cable system using a sample of 1000 subscribers estimates that fifty percent of its subscribers watch premium channel at least five times per week. This is an example of inferential statistics as opposed to descriptive statistics \

(d). A variable that is normally described in words rather than numerically is a *qualitative variable*.

(e). An experiment consists of tossing 4 unbiased coins simultaneously. The number of simple events in this experiment is 18.

(f). Persons or objects on which an experiment is performed are called *experimental units*.

(g) In general, there is no difference between the simple events and the events.

(h). A group of people who, in response to some general appeal, have selected themselves to participate in a survey is called a *simple random sample*.

(i). If the correlation coefficient $r = 0$, then there is no linear relationship whatsoever between the dependent variable y and the independent variable x

(j). When constructing a scatter plot, the independent variable (x) is placed on the horizontal axis, and the dependent variable (y) is placed on the vertical axis.

Q2a (6 pts) Given, the following data set: 8, 7, 1, 4, 6, 6, 4, 5, 7, 6, 3, 0.
Find the five numbers summery needed to make BOX plot and find the IQR.
(Do not draw plot)

(b)(3pts) Calculate the z-score for the smallest and largest observation, if variance is 6.022 . Is either of these observations unusually large or small? Explain.

Q3 (15 pts) Multiple choice, circle correct answer

(a). The two graphical techniques we usually use to present **qualitative** data are

a. bar chart and histogram b. histogram and pie chart
c. bar chart and pie chart d. line chart and stem and leaf plot

(b) Which of the following statements is true for a symmetric distribution?

a. The mean is greater than the median. b. The mean is less than the median.
c. The mean and median are equal. d. None of the above

(c) If x is a normal random variable with mean of 1228 and a standard deviation of 120, the number of standard deviations from 1228 to 1380 is

a. 10.233 b. 3.1989 c. 11.50 d. 1.267

(d) Which of the following is not a measure of variability?

a. The variance b. The standard deviation c. The mean d. The range

(e) If a store manager selected a sample of customers and computed the mean income for this sample, he has computed

a. a parameter b. a statistic c. a qualitative value d. None of the above

(f) The set of all simple events of an experiment is called:

a. a compound event b. a sample space c. a population d. a random sample

(g) 14. Which of the following statements if false?

a. The set of all simple events of an experiment is called the sample space
b. An event that can be decomposed into two is called a simple event
c. The sum of the probabilities for all simple events in the sample space equals 1
d. The probability of an event A is equal to the sum of the probabilities of the simple events contained in A

(h). An event is

a. an experiment that is not controlled by the decision maker
b. the list of all possible simple events of an experiment
(c) a collection of one or more simple events (d) collection of two or more simple events

(i) If z is a standard normal random variable, the area between $z = 0.0$ and $z = 1.20$ is 0.3849, while the area between $z = 0.0$ and $z = 1.40$ is 0.4192. What is the area between $z = -1.20$ and $z = 1.40$?

a. 0.0808 b. 0.1151 c. 0.0343 d. 0.8041

(j)Which of the following statements about the mean is not always correct?

a. The sum of the deviations from the mean is zero
b. Half of the observations are on either side of the mean
c. The mean is a measure of the middle (center) of a distribution
d. The value of the mean times the number of observations equals the sum of all of the observations

(k) Given that Z is a standard normal random variable, $P(-1.2 \leq Z \leq 1.5)$ is

a. 0.8181 b. 0.4772 c. 0.3849 d. 0.5228

(l)The standard deviation of a binomial distribution for which $n = 50$ and $p = 0.15$ is:

a. 50.15 b. 7.082 c. 6.375 d. 2.525

(m). If the random variable x is binomially distributed with $n = 10$ and $p = .05$, then $P(x = 2)$ is

a. .599 b. .914 c. .074 d. 0.55

(n) Given that $s^2_x = 400$, $s^2_y = 625$, $s_{xy} = 350$, and $n = 10$, the correlation coefficient is

a. 0.70 b. 0.56 c. 0.875 d. 0.156

(o). A perfect straight line sloping downward would produce a correlation coefficient equal to

a. +1 b. –1 c. +2 d. –2

Q4 (6 pts) An agricultural economist is interested in determining the average diameter of peaches produced by a particular tree. A random sample of 30 peaches is taken and sample mean is calculated. Suppose that average diameter X of peach on this tree is known from previous years production to be $\mu = 60$ mm with $\sigma = 10$ mm. (a) what is the probability that sample mean X exceeds 63 mm (b) what is the probability that it is between 58 to 63 mm.

Q5(3pts) (a) Find a z_0 such that $P(-z_0 \prec z \prec z_0) = 0.90$

(3pts)(b) a normal random variable x has mean 50 and standard deviation 15 Would it be unusual to observe the value x = 0? Explain your answer.

Q6(8 pts) A random variable x can assume 5 values : 0, 1, 2, 3, 4. A portion of the probability distribution is shown here.

X	0	1	2	3	4
P(X)	.1	.3	.3	-	.1

(a) Find P(3)

(b) Construct a probability histogram

(c) Calculate the population mean and standard deviation

(d) What is the probability that x is greater than 2 ?

(e) What is the probability that x is 3 or less?

Q7 (6 pts)A population consist of 5 numbers 3, 6, 9, 12, 15 . If a random sample of size n = 3 is selected with out replacement, find the sampling distribution for the sample mean and sample median

Q8(8 pts) During the inaugural season of Major league Soccer in the united states, the medical teams documented 256 injuries that caused a loss of participation time to the player. The results of this investigation is given in table below.

Severity	Practice(P)	Game(G)	Total
Minor (A)	66	88	154
Moderate(B)	23	44	67
Major(C)	12	23	35
Total	101	155	256

If one individual is drawn at random from this group of 256 soccer player, find the following probabilities. Show your work with formulas used.

(a) P(A)

(b) $P(A \cap G)$

(c) P(G|B)

(d) $P(B^c)$

(e)P(C|P)

Q9 (6 pts) For the following data set find the range, minimum class width and a convenience class width.

Number of measurement	Smallest and largest value	Number of classes	Range	Minimum class width	Convenient class width
75	0.5 to 1.0	8			
25	0 to 100	6			
200	1200 to 1500	9			

Q10 (6 pts) If A ={ 1,3,4,6}, B= { 2,3,4,5}, and C = { 1,4,6 } and U={ 1,2,3,4,5,6,7 } Draw Venn diagram for $(A \cap B)$, $(B \cup C)$ and (C^c). **Shade the desired area**.