

**Statistics-1 - Midterm exam**

**Duration 1 Hr. 6:15- 7:15 PM.**

Answer as many questions as you can. Maximum you can score is 50.

- (1). Determine whether the following statements are TRUE or FALSE. [10 points]
- a) In the presence of outliers, mean is a better measure of center than the median.
  - b) The standard deviation of the data set  $\{10, 20, 30, 40, 50\}$  is more than that of  $\{-20, -10, 0, 10, 20\}$ .
  - c) A data set has zero standard deviation only if all the data points are equal to the median of the data.
  - d) For a population with a symmetric distribution, the mean always exceeds the median.
  - e) Every data set has one and exactly one mode.
  - f) The mean of a standardized variable always equals zero.
  - g) If  $P(A) = P(B)$  then  $A=B$ .
  - h)  $\{1, 2, 4\}$  is a systematic sample of size 3 from the population  $\{1, 5, 2, 2, 3, 9, 4, 11, 6\}$ .
  - i) For any two events  $E_1$  and  $E_2$ ,  $P(E_1 \cup E_2) = P(E_1) + P(E_2)$ .
  - j) Mean and median are two measures of center that are appropriate only for quantitative data.
- (2). The exam scores of a the students in an introductory statistics class are as follows:

88 82 89 70 85  
63 99 86 67 39  
90 96 76 34 81  
64 75 84 89 96

- a) Construct a dotplot for the above data set. [6 points]
- b) Suppose the grades are assigned to the students based on the following table.

<i>Score range</i>	<i>Grade</i>
81-100	A
61-80	B
51-60	C
41-50	D
00-40	F

Using this table, construct a relative frequency table of grades based on the above 20 scores. Now draw a bar graph using the relative frequency table you just constructed. [9 points]

- (3) The heights (in inches) of a team of ten players are as follows:

67,72,76,76,84,83,78,74,74,64.

- a) Compute the mean and standard deviation of the above data. [6 points]
- b) Compute the three quartiles  $Q_1, Q_2$  and  $Q_3$ . [9 points]

(4)

- a) Suppose  $A$  and  $B$  are two events such that  $P(A) = 1/3$ ,  $P(A \cup B) = 1/2$  and  $P(A \cap B) = 1/10$ . Determine  $P(B)$ . [5 points]
- b) Suppose  $E_1$  and  $E_2$  are two events such that  $P(E_1) = 1/4$ ,  $P(E_2) = 1/3$  and  $P(E_1 \cup E_2) = 1/2$ . Determine  $P(E_1 \cap E_2)$ . [5 points]
- c) Are  $E_1$  and  $E_2$  mutually exclusive? Clearly explain your answer. [5 points]

GOOD LUCK