King Fahd University of Petroleum and Minerals
College of Sciences
Quiz #5(A)

St. ID: St. Name: Serial#:

Q1: Given that the number of hospitals of a sample of cities selected at random from the cities in Saudi Arabia are as follows:

12, 9, 15, 12, 15, 6, 10, 12, 13, 11, 8, 9, 5, 3, 12, 19

Then:

a) What is the name of the random variable in this example?

The number of hospitals in the city

b) What is the type of the variable in (a)?

discrete

c) find the mean of this data

$\bar{x}$ = (12 + 9 + 15 + 12 + 15 + 6 + 10 +12 + 13 +11 + 8 + 9 + 5 + 3 + 12 +19)/16
= 10.69

d) find the median of this data

The ordered data are : 3, 5, 6, ,8 , 9, 9, 10, 11, 12, 12, 12, 12, 13, 15, 15, 19

Then the median = $(X_{(8)} + X_{(9)})/2 = (10 + 11)/2 = 11.5$

e) find the mode of this data

The mode = 12

f) find the sum of deviations of all the data about the mean

the sum of deviations of all the data about the mean = 0

Q2: The probability function of the weekly number of car accidents at a certain intersection is given in the following table:

The find

a) The value of d :

$$\sum_{x=0}^{6} f(x) = 1 = .05 + d + .35 + .19 + .08 + .05 + .03$$

implies that: $d = 1 - (.05 + .35 + .19 + .08 + .05 + .03) = .25$

b) The probability that there will be at most one car accident in a week.

$$P(X \leq 1) = P(X = 0) + P(X = 1) = .05 + .25 = .3$$

x	f(x)
0	0.05
1	.25
2	0.35
3	0.19
4	0.08
5	0.05
6	0.03

b) The expected number of accidents in a week

$$\mu = E(X) = \sum_{x=0}^{6} x\, f(x) = 0(.05) + 1(.25) + 2(.35) + 3(.19) + 4(.08) + 5(.05) + 6(.03) = 2.27$$

c) The standard deviation of the number of accidents in a week

$$\sigma^2 = EX^2 - \mu^2 = \sum_{x=0}^{6} x^2\, f(x) - \mu^2 = (0)^2(.05) + (1)^2(.25) + (2)^2(.35) + (3)^2(.19) + (4)^2(.08) + (5)^2(.05)$$

$$+ (6)^2(.03) - \mu^2 = 6.9 - (2.27)^2 = 1.747$$

The standard deviation = $\sigma = \sqrt{1.747} = 1.322$