MATH 131 **Section:**

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

St. ID: St. Name: Serial#:

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

15, 12, 18, 15, 18, 9, 13, 15, 16, 14, 11, 12, 8, 6, 52, 22

Then:

a) What is the name of the random variable in this example?
The number of accounting companies in the city

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

c) find the mean of this data

$\bar{x}$ = (15 + 12 + 18 + 15 + 18 + 9 + 13 +15 + 16 +14 + 11 + 12 + 8 + 6 + 52 +22)/16
= 16

d) find the median of this data

The ordered data are : 6, 8, 9, ,11 , 12, 12, 13, 14, 15, 15, 15, 16, 18, 18, 22, 52

Then the median = $(X_{(8)} + X_{(9)})/2 = (14 + 15)/2 = 14.5$

e) find the mode of this data

The mode = 15

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 times that the university student goes to the library is in the following table:

The find

a) The value of d

$$\sum_{x=0}^{6} f(x) = 1 = .15 + d + .4 + .15 + .05 + .03 + .01$$

implies that: $d = 1 - (.15 + .4 + .15 + .05 + .03 + .01) = .22$

b) The probability that a student selected at random will go to the library at least 2 times in a week.

$$P(X \geq 2) = 1 - (P(X = 0) + P(X = 0))$$
$$= 1 - (f(0) + f91) = 1 - (.15 + .22) = .63$$

x	f(x)
0	0.15
1	d
2	0.40
3	0.15
4	0.05
5	0.03
6	0.01

c) The expected number of times that a university student will go to the library weekly

$$\mu = E(X) = \sum_{x=0}^{6} x\, f(x) = 0(.15) + 1(.22) + 2(.4) + 3(.15) + 4(.05) + 5(.03) + 6(.01) = 1.88$$

d) The standard deviation of the number of times that a university student will go to the library weekly

$$\sigma^2 = EX^2 - \mu^2 = \sum_{x=0}^{6} x^2 f(x) - \mu^2 = (0)^2(.15) + (1)^2(.22) + (2)^2(.4) + (3)^2(.15) + (4)^2(.05) + (5)^2(.03)$$
$$+ (6)^2(.01) - \mu^2 = 5.08 - (1.88)^2 = 1.5256$$

The standard deviation = $\sigma = \sqrt{1.5256} = 1.24$