National University of Computer and Emerging Sciences
(FAST)

Final Exam FALL-2014

Course: Probability and Statistics (for CS)
Time Allowed: 3 hours Maximum marks: 50

Note: Attempt all questions.

Q1: Write short answers to the following questions. (8)

i. Differentiate between Sample and Population.
ii. Define Statistical Inference.
iii. Write any two properties of Normal Distribution.
iv. What is the difference between one-tailed test and two-tailed test?

Q2: In a high school graduating class of 110 students, 58 studied Mathematics, 72 studied Statistics and 40 studied both Statistics and Mathematics. If one of these students is selected at random, find the probability that :
(a) the student took Mathematics or Statistics;
(b) the student took Statistics but not Mathematics. (4)

Q3: Let X denote the number of times a certain numerical control machine will malfunction: 1, 2, or 3 times on any given day. Let Y denote the number of times a technician is called on an emergency call. Their joint probability distribution is given as:

f(x,y)		x		
		1	2	3
y	1	0.05	0.05	0.1
	2	0.05	0.1	0.35
	3	0	0.2	0.1

(a) Find P(Y=3/X=2),
(b) Find the covariance of the random variables X and Y,
(c) Show whether X and Y are independent or not. (6)

Q4: Suppose the probability is 0.7 that any given person will believe a tale about the transgressions of a famous actress. What is the probability that:
(a) the fifth person to hear this tale is the third one to believe it?
(b) the fourth person to hear this tale is the first one to believe it? (4)