Minia University – Faculty of Science

Department of math.
2022/2023

Final Exam of 2nd Term

Course : Probability and statistics.

Code : M103

Answer the following questions:

Q1)a)Define : Mutually exclusive events; Independent events; Probability Axioms.

b) A sample of four electronic components is taken from the output of a production line. The probabilities of the various outcomes are calculated to be: Pr [0 defectives]= 0.6, Pr [1 defective] = 0.2, Pr [2 defectives] = 0.04, Pr [3 defectives] =0.03, Pr [4 defectives] = 0.01.

i)What is the probability of at least three defective?

ii) What is the probability of at most one defective?

Q2)a) Find G.M ; A.M ;median; mode σ and C.V for the following set *25,8,15,5,7* ?

b)If prove that $f(x) = C_x^n p^x q^{n-x}$; $x = 0, 1, 2, \ldots, n$ is a mass function ; m find the moment generating function and σ?

Q3)a)Prove that $f(x) = \frac{1}{b-a}, a < x < b$ is density function and find $E(x^7)$?

b)A researcher wishes to estimate the number of days it takes an automobile dealer to sell a Chevrolet Aveo. A sample of 49 cars had a mean time on the dealer's lot of 70 days. Assume the population standard deviation to be 7 days. Find the best point estimate of the population mean and the 95% confidence interval of the population mean.? $z_{0.05} = 1.65$; $z_{0.025} = 1.96$

Q4) The following data for two tests is given:

X	9	5	3	7	11
Y	5	6	1	9	9

a) Calculate the correlation coefficient between X and Y?

b) Find the equation of the line of best fit?

c) Find Y when X=1.5?

THE END