

(083) Math 131:Finite Mathematics QuizTest-Four(9.1-2): August 29, 2009

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Contents

Marks: 15; Time: 15 Minutes

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SERIAL# SECTION #: (check: Sec.01A)

01	A	9 : 20 <i>am</i> Sec : 02	10 : 30 <i>am</i> Sec : 01	
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NOTE: SHOW ALL STEPS OF THE SOLUTION.

NO CREDIT FOR ANSWERS WITHOUT COMPLETE SOLUTION.

The questions are not in any order of difficulty at all. Only the nonprogramable calculators are allowed.

Write the simplified answer of each question at the end of each question.

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Q.1.(Marks : 5). A box of 10 flashbulbs contains 3 defective bulbs.

A random sample of 2 is selected and tested.

Let X be the random variable associated with the number of defective bulbs in the sample.

Find the probability distribution of X .

Complete the following table.

$X = x$	$f(x) = P(X = x)$		
$X = 0$			
$X = 1$			
$X = 2$			

Q.2. (Marks : 2 + 2 + 1). Suppose that a die is not fair and we obtain (empirically) the following probability distribution for X .

$X = x$	$p(x) = P(X = x)$		
1	0.14		
2	0.13		
3	0.18		
4	0.20		
5	0.11		
6	0.24		

(a). What is the expected value of X .

$\mu = E(X) = \text{-----}$

(b). What is the expected value of X .

$E(X^2) = \text{-----}$

(c). What is the variance of X .

$\sigma^2 = Var(X) = \text{-----}$

(d) $P(2X + 1 < 7) = \text{-----}$

(e) $P(2X + 1 \geq 9) = \text{-----}$

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BINOMIAL DISTRIBUTION:

$[X \sim Bin(n, p) . (q = 1 - p) .$

$f(x) = P(X = x) = \binom{n}{x} p^x q^{n-x},$

where, $x = 0, 1, 2, 3, \dots, n.]$

Q.3. (Marks : 3 + 1 + 1). Testing. A multiple choice test is given with 5 choices (only one is correct) for each of 10 questions.

(a) What is the probability of passing the test with a grade of 70 % or better just by guessing?

(Hint : Let X be the number of correct answers. Then $X \sim Bin(n, p)$).

$P(X \geq 7) = \text{-----}$

(b) What is expected value $\mu = E(X)$ of X .

$\mu = E(X) = \text{-----}$

(c) What is the variance $\sigma^2 = Var(X)$.

$\sigma^2 = Var(X) = \text{-----}$