

# MATH 131-02 QUIZTEST VI (072FEB16-JUN21,2008) CH.9: 9.1-9.2.

Dr. Raja Mohammad Latif      Time: Fifteen Minutes , Marks: 30, June 04, 2008.

Name: \_\_\_\_\_, I.D.# \_\_\_\_\_

**NOTE: 1.** The questions are not in any order of difficulty at all.

**2.** Please provide complete solution for all the problems for full credit.

**3.** Only nonprogramable calculators are allowed.

**4.** Any type of mobiles or pagers are not allowed during the examination.

**5.** Please count that you have exactly 2 questions.

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$X \sim \text{Bin}(n, p) : f(x) = P(X = x) = \binom{n}{x} p^x q^{n-x}, x = 0, 1, 2, 3, \dots, n; (q = 1 - p);$   
 Expected Value of  $X := E(X) = \mu = np$   
 Variance of  $X : \text{Var}(X) = \sigma^2 = npq.$

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**Q.1. 493T10.3B26.** (Marks : 3 + 3 + 3 + 6 = 15) .(Quality Control)  
 In a production process, the probability of a defective unit is 0.10.

Suppose a sample of 10 units is selected at random.

Let  $X$  be the number of defectives.

(a) Use the Binomial Distribution to answer the following questions:

(i). Find the expected number of defective units.

$\mu = E(X) =$  \_\_\_\_\_

(ii). Find the variance  $\text{Var}(X)$ .

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

(iii) Find the Probability that  $P(X = 8) =$

(iii) Find the Probability that  $P(3 < 5 \leq 6) :$  \_\_\_\_\_

**Q.2. 450S8.3M3.** (Marks : 5 × 3 = 15)

(Weather and Attendance) Attendance at a football game in a certain city results in the following pattern.

If it is extremely cold, the attendance will be 30000;  
 if it is cold, it will be 40000;  
 if it is moderate, 60000;  
 and if it is warm, 80000.

If the probabilities for extremely cold, cold, moderate, and warm are 0.40, 0.35, 0.15 and 0.20, respectively.

Let  $X =$  the number of people attended the game.

$X = x$	30000	40000	60000	80000
$P(X = x)$	0.40	0.35	0.15	0.20

Answer the following questions:

(a) How many fans are expected to attend the game?

$\mu = E(X) =$  \_\_\_\_\_

(b) Find the expected value of  $X^2$ .

$E(X^2) =$  \_\_\_\_\_.

(c) What is the probability that between 65000 and 75000 fans will attend the game?

$\Pr(65000 < X < 75000) =$  \_\_\_\_\_

(d) What is the probability that between 45000 and 55000 fans will not attend the game?

$\Pr(45000 < X < 55000) =$  \_\_\_\_\_

(e) What is the probability that between 35000 and 75000 fans will attend the game?

$\Pr(35000 < X < 75000) =$  \_\_\_\_\_