

THE OPEN UNIVERSITY OF SRI LANKA
B.Sc./B.Ed. Degree Programme, Continuing Education Programme
APPLIED MATHEMATICS – LEVEL 04
APU2140 – Statistical Distribution Theory
CLOSE BOOK TEST 2010/2011



Duration: One and Half Hours.

Date: 08.10.2010

Time: 4.00 p.m.- 5.30 p.m

Non programmable calculators are permitted. Statistical tables are provided.

Answer All Questions.

1. The density function of a particular random variable X is given by

$$\begin{cases} f(x) = \frac{x}{k} & ; \text{ when } 0 < x \leq 3 \\ f(x) = \frac{(6-x)}{k} & ; \text{ when } 3 < x < 6 \\ 0 & ; \text{ otherwise} \end{cases}$$

- (i) Find the value of k .
- (ii) Find the mean and the variance of X .
- (iii) Find $\Pr(X < 2)$
- (iv) Find $\Pr(2 < X < 5)$
2. According to the past data, the probability of not raining to a stadium in a certain area on a given day during April is 0.95. A netball tournament is going to be held in this stadium from 15th April 2011 to 18th April 2011.
- (i) What is the probability that there will be no rain during the tournament?
- (ii) What is the probability that there will be rain during the tournament?
- (iii) Find the probability that there will be rain on the second and the third days of the tournament.

3 The number of traffic accidents that occur on a particular stretch of road during a month follows a Poisson distribution with a mean of 9.

- (i) Find the probability of observing five or more accidents on this stretch of road during next month.
- (ii) Find the probability of observing exactly twelve accidents on this stretch of road during next two months.
- (iii) Assuming that next month has 30 days find the probability of observing two to five accidents on this stretch of road during the first 10 days of next month.