Class Test-1 Spring-2024 Branch- ECE

Subject: Inferential Statistics

Code: MA-3012

Full Marks: 15 **Time: 55min**

Answer all questions

1. The cdf of X is defined as follows.

$$F(x) = \begin{cases} 0, & x < 0 \\ 0.06, & 0 \le x < 1 \\ 0.19, & 1 \le x < 2 \\ 0.39, & 2 \le x < 3 \\ 0.67, & 3 \le x < 4 \\ 0.92, & 4 \le x < 5 \\ 0.97, & 5 \le x < 6 \\ 1, & x \ge 6 \end{cases}$$

(a) Find $P(X = 2)$
(b) Find $P(X > 3)$
(c) Find $P(2 \le X \le 5)$
(d) Find $P(2 < X < 5)$ [5]

2. A chemical supply company currently has in stock 100 lb of a certain chemical, which it sells to customers in 5-lb batches. Let X be the number of batches ordered by a randomly chosen customer, and suppose that X has pmf

x	1	2	3	4
$p(x)$	.1	.3	.4	.2

Compute $E(X)$ and $V(X)$. Then compute the expected number of pounds left after the next customer's order is shipped and the variance of the number of pounds left.

[5]

3. A particular type of tennis racket comes in a midsize version and an oversize version. Sixty percent of all customers at a certain store want the oversize version.

a. Among ten randomly selected customers who want this type of racket, what is the probability that at least six want the oversize version?

b. Among ten randomly selected customers, what is the probability that the number who want the oversize version is within 1 standard deviation of the mean value?

c. The store currently has seven rackets of each version.What is the probability that all of the next ten customers who want this racket can get the version they want from current stock?

[5]