Port City International University
Excellence in Higher Education
UGC & Govt. Approved University at Khulshi in Chittagong

Course Code: Math 335

Course Title:

Mathematical and Probabilistic Analysis

Assignment Topics:

Mid Term

Submitted to

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Problem No: 03

Problem Name: 60% of people who purchase sports cars are men. Find the probability that exactly 7 are men if 10 sports car owners are randomly selected.

Solution:

Given, 60% of people who purchase sports car are men.

To Find,

If 10 sports car owners randomly selected, find the probability that exactly 7 are men.

→ It is given that 60% of people who purchase sports car are men. therefore, 40% of people who purchase sports car are women.

Here, we have to find the probability that, exactly 7 are men if we select car owner randomly.

It is a binomial case with $n=10$ and

P(men) $60\% = 0.6$

P(women) $= 0.4$

therefore, $P(x=7)$ is

$= 10C7 \times 0.6^7 \times 0.4^3$

$= 0.214999$

$= 0.2150$

Hence, 0.2150 is the probability that randomly selected 7 car owner are men.

Problem No: 2

Problem Name: The number of flaws on a VHS magnetic tape produced continuously at a factory follows a Poisson distribution with an average of 0.01 flaws per meter. A standard VHS cassette tape contains 250 meters of magnetic tape. What is the probability that there are at least two flaws in a single VHS cassette tape?

Solution:

X = number of flaws in a poisson random variable with $\lambda = 0.01(250) = 2.5$ per cassette

$$P(X \geq 2) = 1 - [P(X=0) + P(X=1)]$$

$$= 1 - \left[\frac{e^{-2.5}(2.5)^0}{0!} + \frac{e^{-2.5}(2.5)^1}{1!}\right]$$

$$= 0.7127$$