All Branches Hinglish

Subject: Engineering Mathematics

DPP-06

Chapter: Probability

Topic : Continuous Random Variable

1. X is a uniformly distributed random variable that takes values between 0 and 1. the value of $E(X^3)$ will be

(a) 0 (b) 1/8
(c) 1/4 (d) 1/2

2. A random variable is uniformly distributed over the interval 2 to 10. Its variance will be

(a) 16/3 (b) 6
(c) 256/9 (d) 36

3. Consider a Gaussian distributed random variable with zero mean and standard deviation σ. The value of its cumulative distribution function at the origin will be _____.

(a) 0 (b) 0.5
(c) 1 (d) 10 σ

4. The independent random variables X and Y are uniformly distributed in the interval [–1, 1]. The probability that max [X,Y] is less than 1/2 is

(a) 3/4 (b) 9/16
(c) 1/4 (d) 2/3

5. Let X be a random variable which is uniformly chosen from the set of positive odd numbers less than 100. The expectation, E[X] is _____

6. A traffic office imposes on an average 5 number of penalties daily on traffic violators. Assume that the number of penalties on different days is independent and follows a Poisson distribution. The probability that there will be less than 4 penalties in a day is_____.

7. An observer counts 240 veh/h at a specific highway location. Assume that the vehicles arrival at the location is Poisson distributed, the probability of Having one vehicle arriving over a 30-second time interval is _____.

8. A simple random sample of 100 observations was taken from a large population. The sample mean & the standard deviation were determined to be 80 and 12 respectively. The standards error of mean is _____.

9. The standard deviation of a uniformly distributed random variable between 0 and 1 is

(a) $\frac{1}{\sqrt{12}}$ (b) $\frac{1}{\sqrt{3}}$
(c) $\frac{5}{\sqrt{12}}$ (d) $\frac{7}{12}$

10. Suppose p is the number of cars per minute passing through a certain road junction between 5 PM and 6 PM, and p has a Poisson distribution with mean 3. What is the probability of observing fewer than 3 cars during any given minute in this interval?

(a) $\frac{8}{\left(2e^3\right)}$ (b) $\frac{9}{\left(2e^3\right)}$
(c) $\frac{17}{\left(2e^3\right)}$ (d) $\frac{26}{\left(2e^3\right)}$

Answer Key

1. **(c)**
2. **(a)**
3. **(b)**
4. **(b)**
5. **(50)**
6. **(0.265)**
7. **(0.27)**
8. **(1.2)**
9. **(a)**
10. **(c)**