All Branches Hinglish

Subject: Engineering Mathematics

DPP-08

Chapter: Probability

Topic : Mean, Median & Mode

1. The standard deviation for the data 7, 9, 11, 13, 15 is

(a) 2.4 (b) 2.5

(c) 2.7 (d) 2.8

2. Consider the continuous random variable with probability density function

$f(t) = 1 + t$ for $-1 \le t \le 0$

$= 1 - t$ for $0 \le t < 1$

The standard deviation of the random variable is

(a) $\frac{1}{\sqrt{3}}$ (b) $\frac{1}{\sqrt{6}}$

(c) $\frac{1}{3}$ (d) $\frac{1}{6}$

3. Let X and Y be two independent random variables. Which one of the relations between expectation (E), variance (Var) and covariance (Cov) given below is FALSE?

(a) E(XY) = E(X) E(Y)

(b) Cov (X, Y) = 0

(c) Var (X + Y) = Var (X) + Var (Y)

(d) $E(X^2Y^2) = (E(X))^2 (E(Y))^2$

4. In the following table, x is a discrete random variable and $p(x)$ is the probability density. The standard deviation of x is

x	1	2	3
p(x)	0.3	0.6	0.1

(a) 0.18 (b) 0.36

(c) 0.54 (d) 0.6

5. The probability density function of evaporation E on any day during a year in watershed is given by

$$f(E) = \begin{cases} \frac{1}{5} & 0 \le E \le 5 \text{ mm/day} \\ 0 & \text{otherwise} \end{cases}$$

The probability that E lies in between 2 and 4 mm/day in a day in watershed is (in decimal) _____

6. Let X be a random variable with probability density function

$$f(x) = \begin{cases} 0.2, & \text{for } |x| \le 1 \\ 0.1, & \text{for } 1 < |x| \le 4 \\ 0, & \text{otherwise} \end{cases}$$

The probability P(0.5 < X < 5) is _____.

7. Mark obtained by 100 students in an examination are given in the table

SI. No.	Marks obtained	Number of students
1	25	20
2	30	20
3	35	40
4	40	20

What would be the mean, median and mode of the marks obtained by the students?

(a) Mean 33; Median 35; Mode 40

(b) Mean 35; Median 32; Mode 40

(c) Mean 33; Median 35; Mode 35

(d) Mean 35; Median 32; Mode 35

8. Two random variable x and y are distributed according to

$$f_{x,y}(x,y) = \begin{cases} (x+y), & 0 \le x \le 1, 0 \le y \le 1 \\ 0, & \text{otherwise} \end{cases}$$

The probability P (x + y ≤ 1) is _____.

Common data question 9-10

Suppose the probability density function of a continuous random variable x is $f(x) = 3x^2$,$0 < x < 1$.

9. Find 'a' satisfying the following condition

(A) P[x ≤ a] = P [x ≥ a]

10. Find ‘b’ satisfying the following condition
(A) $P[x > b] = 0.05$

Answer Key

1. **(d)**
2. **(b)**
3. **(d)**
4. **(d)**
5. (0.4**)**
6. **(0.4)**
7. **(c)**
8. **(0.33)**
9. **(0.795)**
10. **(0.983)**