CUET Mathematics Test - Set 8

Chapter: Probability Distributions (Random Variables)

General Instructions

1. Total Questions: **15**
2. Duration: **60 Minutes**
3. All questions are compulsory.
4. Each question carries **5 marks**.
5. For each correct answer: **+5 marks**.
6. For each incorrect answer: **-1 mark**.
7. No negative marking for unanswered questions.
8. Use of calculator or electronic devices is strictly prohibited.
9. Choose the most appropriate answer from the given options.

1. A random variable X has the following probability distribution:
   $X : 0, 1, 2, 3$
   $P(X) : c, 2c, 3c, 4c$
   The value of $P(1 < X \leq 3)$ is:
   (A) 0.3
   (B) 0.5
   (C) 0.7
   (D) 0.9

2. If X is a random variable such that $\sum_{i=1}^{n} P(x_i) = 1$, which of the following cannot be a value of $P(x_i)$ for any i?
   (A) 0
   (B) e^{-1}
   (C) $\sin(3\pi/2)$
   (D) $1/\pi$

3. Two balanced dice are thrown. If X is the absolute difference between the numbers appearing on the dice, then $P(X = 0)$ is:
   (A) 1/36
   (B) 1/6
   (C) 1/12
   (D) 5/18

4. A random variable X takes values $1, 2, 3, 4$ with probabilities $k, 2k, 3k, 4k$ respectively. The value of $P(X < 3)$ is:
   (A) 0.3
   (B) 0.1
   (C) 0.6
   (D) 0.4

5. A box contains 100 bulbs of which 10 are defective. A sample of 3 bulbs is drawn with replacement. Let X be the number of defective bulbs. $P(X = 1)$ is:
   (A) 0.27
   (B) 0.243
   (C) 0.81
   (D) 0.1

6. The probability distribution of X is given by $P(X = x) = \frac{k}{x+1}$ for $x = 0, 1, 2$. The value of k is:
   (A) 11/6
   (B) 6/11
   (C) 1
   (D) 3/2

7. Let X be the number of tails in 3 tosses of a coin. Then $P(X \geq 2)$ is:
   (A) 1/4
   (B) 3/8
   (C) 1/2
   (D) 7/8

8. A random variable X has the distribution $P(X = x) = kx$ for $x = 1, 2, \ldots, 5$. Then $P(X$ is a prime number) is:
   (A) 2/3
   (B) 3/5

(C) 1/2
(D) 1/3

9. If the probability distribution of X is $P(X = i) = c/i^2$ for $i = 1, 2$, then the constant c is:
(A) 4/5
(B) 5/4
(C) 1/2
(D) 3/4

10. Three cards are drawn with replacement from a pack of 52. Let X be the number of Diamond cards. The probability $P(X = 3)$ is:
(A) 1/4
(B) 1/16
(C) 1/64
(D) 3/64

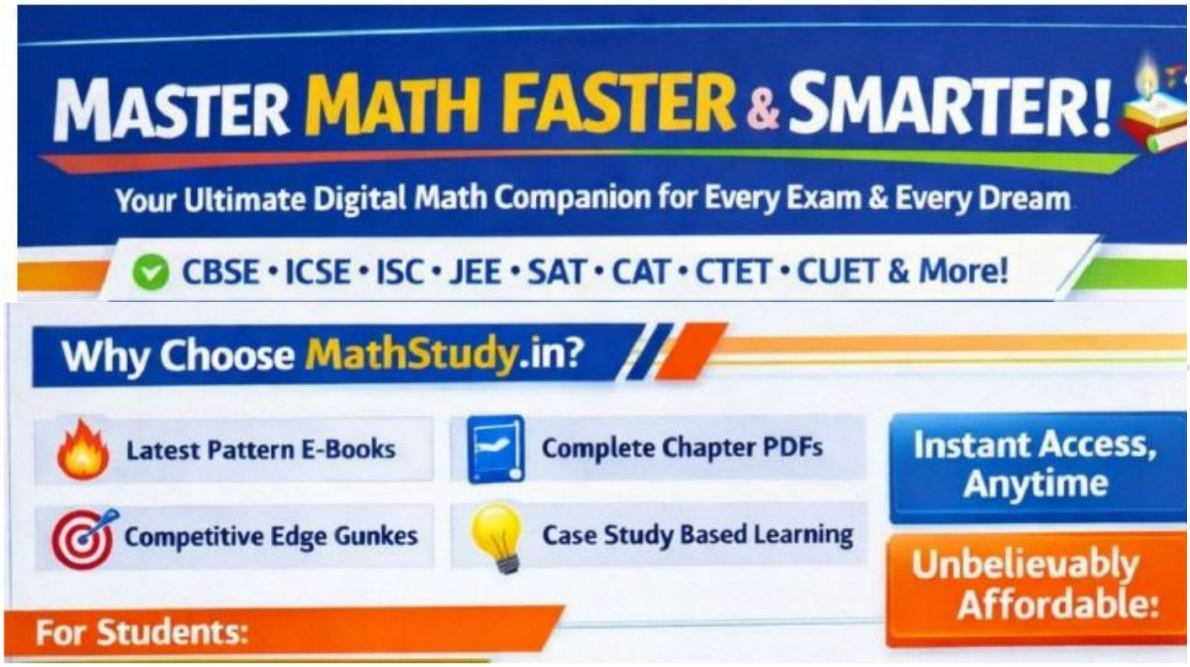
11. A random variable X takes values $-1, 0, 1$ with probabilities $1/4, 1/2, 1/4$. The probability $P(|X| = 1)$ is:
(A) 1/4
(B) 1/2
(C) 3/4
(D) 1

12. For a random variable X, $P(X = x) = C(2^x)$ for $x = 1, 2, 3$. The value of C is:
(A) 1/14
(B) 1/7
(C) 1/8
(D) 1/12

13. In a meeting, 70% of the members favor a certain proposal. A member is selected at random and we take $X = 0$ if he opposed, $X = 1$ if he favors. Then $P(X = 0)$ is:
(A) 0.7
(B) 0.3
(C) 0.5
(D) 1

14. A pair of dice is rolled. If X is the sum of numbers appearing, find $P(X$ is a multiple of 4).
(A) 1/4
(B) 1/3
(C) 1/9
(D) 1/6

15. If $P(X = x) = k^4 C_x$ for $x = 0, 1, 2, 3, 4$, the value of k is:
(A) 1/16
(B) 1/4
(C) 1/8
(D) 1/32



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