

CUET Mathematics Test

Unit VI: Probability

General Instructions

1. Total Questions: **20**
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.

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- If $P(A) = 0.4$, $P(B) = 0.8$ and $P(B|A) = 0.6$, then $P(A \cup B)$ is:
(A) 0.24
(B) 0.96
(C) 0.48
(D) 0.32
- Two events A and B are such that $P(A) \neq 0$. $P(B|A)$ is equal to 1 if:
(A) $A \subset B$
(B) $B \subset A$
(C) $B = \phi$
(D) $A \cap B = \phi$
- If A and B are independent events such that $P(A) = p$ and $P(B) = 2p$, and $P(\text{exactly one of } A, B \text{ occurs}) = \frac{5}{9}$, then the value of p is:
(A) $\frac{1}{3}$
(B) $\frac{1}{6}$
(C) $\frac{5}{12}$
(D) $\frac{2}{9}$
- A bag contains 5 red and 3 blue balls. If 3 balls are drawn at random without replacement, the probability that exactly two of them are red is:
(A) $\frac{15}{28}$
(B) $\frac{5}{14}$
(C) $\frac{15}{56}$
(D) $\frac{10}{28}$
- Let A and B be two events such that $P(A) = 0.3$, $P(B) = 0.6$ and $P(A|B) = 0.4$. Then $P(\bar{A}|\bar{B})$ is:
(A) 0.5
(B) 0.85
(C) 0.34
(D) 0.65
- Three persons A, B, C fire at a target in turn. Their probabilities of hitting the target are 0.4, 0.3 and 0.2 respectively. The probability that the target is hit is:
(A) 0.024
(B) 0.336
(C) 0.664
(D) 0.9
- A pair of dice is thrown. If the sum of the numbers appearing on the dice is 8, then the probability that the number 4 has appeared at least once is:
(A) $\frac{1}{5}$
(B) $\frac{2}{5}$
(C) $\frac{3}{5}$
(D) $\frac{4}{5}$
- If A and B are two independent events, then $P(A \cap B)$ is equal to:
(A) $P(A) + P(B)$
(B) $P(A|B) \cdot P(B)$
(C) $P(A) \cdot P(B)$
(D) $P(A) + P(B) - P(A \cup B)$
- An urn contains 6 red and 4 black balls. Two balls are drawn one by one with replacement. Let X be the number of black balls. The variance of X is:

- (A) 0.48
 (B) 0.24
 (C) 0.6
 (D) 0.8
10. Bag I contains 3 red and 4 black balls while another Bag II contains 5 red and 6 black balls. One ball is drawn at random from one of the bags and it is found to be red. The probability that it was drawn from Bag II is:
 (A) $35/68$
 (B) $33/68$
 (C) $1/2$
 (D) $5/11$
11. For a random variable X , $E(X) = 3$ and $E(X^2) = 13$. Then the standard deviation of X is:
 (A) 4
 (B) 10
 (C) 2
 (D) $\sqrt{13}$
12. If $P(A|B) > P(A)$, then which of the following is correct?
 (A) $P(B|A) < P(B)$
 (B) $P(A \cap B) < P(A) \cdot P(B)$
 (C) $P(B|A) > P(B)$
 (D) $P(B|A) = P(B)$
13. A coin is biased so that the head is 3 times as likely to occur as tail. If the coin is tossed twice, the probability distribution of number of tails X at $X = 1$ is:
 (A) $3/16$
 (B) $6/16$
 (C) $1/16$
 (D) $9/16$
14. Probability that A speaks truth is $4/5$. A coin is tossed. A reports that a head appears. The probability that actually there was a head is:
 (A) $4/5$
 (B) $1/2$
 (C) $1/5$
 (D) $2/5$
15. The multiplication theorem of probability for two events A and B states that $P(A \cap B)$ is:
 (A) $P(A) \cdot P(B|A)$
 (B) $P(B) \cdot P(A|B)$
 (C) Both (A) and (B)
 (D) None of these
16. If X is a random variable with the following probability distribution: $P(X = 0) = k$, $P(X = 1) = 2k$, $P(X = 2) = 3k$, then the value of k is:
 (A) $1/3$
 (B) $1/6$
 (C) $1/2$
 (D) 1
17. In a factory which manufactures bolts, machines A , B and C manufacture 25, 35 and 40 percent of the total bolts respectively. Of their output 5, 4 and 2 percent are defective

- bolts. A bolt is drawn at random and found to be defective. The probability that it is manufactured by machine B is:
- (A) $28/69$
 - (B) $25/69$
 - (C) $16/69$
 - (D) $35/100$
18. Two cards are drawn successively with replacement from a well-shuffled deck of 52 cards. The probability of getting two kings is:
- (A) $1/169$
 - (B) $1/221$
 - (C) $1/13$
 - (D) $2/13$
19. If $P(A) = 1/2$, $P(B) = 0$, then $P(A|B)$ is:
- (A) 0
 - (B) $1/2$
 - (C) Not defined
 - (D) 1
20. A random variable X has a probability distribution $P(X)$ of the form: $P(X = x) = k$ if $x = 0$; $2k$ if $x = 1$; $3k$ if $x = 2$; 0 otherwise. Then $E(X)$ is:
- (A) $1/6$
 - (B) $4/3$
 - (C) 1
 - (D) 1.5

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