RK VISION ACADEMY

NEET | IIT – JEE | FOUNDATION

CBSE PRACTICE PAPER(2024)

(Mathematics)

Grade : XII **Marks: 40 marks**

Chapter: Probability Set-1 **Time: 90 minutes**

SECTION A

(This section comprises of Multiple-choice questions (MCQ) of 1 mark each.)

1. The probabilities of three mutually exclusive events are 2/3, 1/4 and 1/6. The statement is

(a) True (b) Wrong (c)Could be either (d)Do not know

2. Two numbers are selected randomly from the set $S=\{1,2,3,4,5,6\}$ without replacement one by one. The probability that minimum of the two numbers is less than 4 is

(a) $\frac{1}{15}$ (b) $\frac{14}{15}$ (c) $\frac{1}{5}$ (d) $\frac{4}{5}$

3. A bag contains 6 white, 7 red and 5 black balls. If 3 balls are drawn from the bag at random, then the probability that all of them are white is

(a) $\frac{20}{204}$ (b) $\frac{5}{204}$ (c) $\frac{1}{3}$ (d) None of these

4. If $P(A)=\frac{1}{4}$, $P(B)=\frac{5}{8}$ and $P(A\cup B)=\frac{3}{4}$, then $P(A\cap B)=$

(a) $\frac{1}{8}$ (b) 0 (c) $\frac{3}{4}$ (d) 1

5. If A and B are two independent events such that $P(A)=0.40,\ P(B)=0.50.$ Find P(neither A nor B)

(a) 0.90 (b) 0.10 (c) 0.2 (d) 0.3

6. If A and B are any two events, then the probability that exactly one of them occur is

(a) $P(A)+P(B)-P(A\cap B)$ (b) $P(A)+P(B)-2P(A\cap B)$ (c) $P(A)+P(B)-P(A\cup B)$ (d) $P(A)+P(B)-2P(A\cup B)$

7. A pair has two children. If one of them is boy, then the probability that other is also a boy, is

(a) $\frac{1}{2}$ (b) $\frac{1}{4}$ (c) $\frac{1}{3}$ (d) None of these

8. In a certain town, 40% of the people have brown hair, 25% have brown eyes and 15% have both brown hair and brown eyes. If a person selected at random from the town, has brown hair, the probability that he also has brown eyes, is

(a) $\frac{1}{5}$ (b) $\frac{3}{8}$ (c) $\frac{1}{3}$ (d) $\frac{2}{3}$

9. A and B are two events such that $P(A)$= 0.8, $P(B)$=0.6 and $P(A\cap B)=0.5,$ then the value of $P(A/B)$ is

(a) $\frac{5}{6}$ (b) $\frac{5}{8}$ (c) $\frac{9}{10}$ (d) None of these

10 Bag *A* contains 4 green and 3 red balls and bag *B* contains 4 red and 3 green balls. One bag is taken at random and a ball is drawn and noted it is green. The probability that it comes bag *B*

(a) $\frac{2}{7}$ (b) $\frac{2}{3}$ (c) $\frac{3}{7}$ (d) $\frac{1}{3}$

SECTION B

(This section comprises of very short answer type-questions (VSA) of 2 marks each.)

11 Two dice are thrown together. Let A be the event 'getting 6 on the first die' and B be the event 'getting 2 on the second die'. Are the events A and B independent

12 The probability that at least one of the two events A and B occurs is 0.6. If A and B occur simultaneously with probability 0.3, evaluate P($\bar{A}$) + P($\bar{B}$)

13 A die is thrown three times. Let X be 'the number of twos seen'. Find the expectation of X.

SECTION C

(This section comprises of short answer type questions (SA) of 3 marks each)

14 A discrete random variable X has the following probability distribution

X	**1**	**2**	**3**	**4**	**5**	**6**	**7**
P(X)	**C**	**2C**	**2C**	**3C**	**C^2**	**$2C^2$**	**$7C^2+1$**

Find the value of C. Also find the mean of the distribution.

15 Three events A, B and C have probabilities 2/ 5 , 1/ 3 and 1/ 2 , respectively. Given that P(A∩ C) = 1 5 and P(B∩ C) = 1 4 , find the values of P(C | B) and P(A'∩ C')

16 Ten coins are tossed. What is the probability of getting at least 8 heads?

SECTION D

(This section comprises of long answer-type questions (LA) of 5 marks each)

17 Three machines E1 , E2 , E3 in a certain factory produce 50%, 25% and 25%, respectively, of the total daily output of electric tubes. It is known that 4% of the tubes produced one each of machines E1 and E2 are defective, and that 5% of those produced on E3 are defective. If one tube is picked up at random from a day's production, calculate the probability that it is defective.

18 An item is manufactured by three machines A, B and C. Out of the total number of items manufactured during a specified period, 50% are manufactured on A, 30% on B and 20% on C. 2% of the items produced on A and 2% of items produced on B are defective, and 3% of these produced on C are defective. All the items are stored at one godown. One item is drawn at random and is found to be defective. What is the probability that it was manufactured on machine A?

SECTION E

(This section comprise one question of 4 mark)

19 A letter is known to have come either from TATA NAGAR or from CALCUTTA. On the envelope, just two consecutive letter TA are visible. What is the probability that the letter came from TATA NAGAR.