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. Let A and B be two events. If P (A) = 0.2, P (B) = 0.4, P (A∪B) = 0.6, then P (A | B) is equal to

   (A) 0.8 (B) 0.5 (C) 0.3 (D) 0

2. Let A and B be two events such that P (A) = 0.6, P (B) = 0.2, and P (A | B) = 0.5. Then P (A′ | B′) equals

   (A) 1 /10 (B) 3 /10 (C) 3/ 8 (D) 6/7

3. If A and B are independent events such that 0 < P (A) < 1 and 0 < P (B) < 1, then which of the following is

   (A) A and B are mutually exclusive (B) A and B′ are independent (C) A′ and B are independent (D) A′ and B′ are independent

4. Let X be a discrete random variable assuming values x1 , x2 , ..., xn with probabilities p1 , p2 , ..., pn , respectively. Then variance of X is given by

   (A) E (X^2) (B) E (X^2) + E (X) (C) E (X^2) – [E (X)]^2 (D) $\sqrt{E\,(X2) - [E\,(X)]2}$

5. If P(A) = 4/ 5 , and P(A ∩ B) = 7/ 10 , then P(B | A) is equal to

   (A) 1 /10 (B) 1/ 8 (C) 7/ 8 (D) 17/ 20

6. If P(A ∩ B) = 7/ 10 and P(B) = 17 //20 , then P (A | B) equals

   (A) 14/ 17 (B) 17/ 20 (C) 7/ 8 (D) 1/ 8

7. If P(A) = 3 /10 , P (B) = 2/ 5 and P(A∪B) = 3/5 , then P (B | A) + P (A | B) equals

   (A) 1/ 4 (B) 1/ 3 (C) 5/ 12 (D) 7/ 2

8. If A and B are two events such that P(A) = 1/ 2 , P(B) = 1/ 3 , P(A/B)= 1/4, then P(A'∩ B') equals

   (A) 1/ 12 (B) 3 /4 (C) 1 /4 (D) 3 /16

9. If P(A) = 0.4, P(B) = 0.8 and P(B | A) = 0.6, then P(A ∪B) is equal to

   (A) 0.24 (B) 0.3 (C) 0.48 (D) 0.96

10 If two events are independent, then

   (A) they must be mutually exclusive (B) the sum of their probabilities must be equal to 1 (C) (A) and (B) both are correct (D) None of the above is correct

SECTION B

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

11 A bag contains 5 red marbles and 3 black marbles. Three marbles are drawn one by one without replacement. What is the probability that at least one of the three marbles drawn be black, if the first marble is red?

12 Two dice are thrown together and the total score is noted. The events E, F and G are 'a total of 4', 'a total of 9 or more', and 'a total divisible by 5', respectively. Calculate P(E), P(F) and P(G) and decide which pairs of events, if any, are independent.

13 A die is thrown 5 times. Find the probability that an odd number will come up exactly three times.

SECTION C

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

14 If X is the number of tails in three tosses of a coin, determine the standard deviation of X.

15 Three dice are thrown at the sametime. Find the probability of getting three two's, if it is known that the sum of the numbers on the dice was six.

16 A bag contains 4 white and 5 black balls. Another bag contains 9 white and 7 black balls. A ball is transferred from the first bag to the second and then a ball is drawn at random from the second bag. Find the probability that the ball drawn is white.

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 Four balls are to be drawn without replacement from a box containing 8 red and 4 white balls. If X denotes the number of red ball drawn, find the probability distribution of X.

19 A car manufacturing factory has two plants, X and Y. Plant X manufactures 70% of cars and plant Y manufactures 30%. 80% of the cars at plant X and 90% of the cars at plant Y are rated of standard quality. A car is chosen at random and is found to be of standard quality. What is the probability that it has come from plant X?