All Branches Hinglish

Subject: Engineering Mathematics

DPP-02

Chapter: Probability & Statistics

Topic : Classification of Events

1. If the probability that A and B will die within a year are p and q respectively. Then the probability that only of one of them will be alive at the end of the year is:

(a) $p + q$ (b) $p + q - 2pq$

(c) $p + q - pq$ (d) $p + q + pq$

2. If A and B each toss three coins. The probability that both get the same number of heads is:

(a) 1/9 (b) 3/16

(c) 5/16 (d) 3/8

3. If A and B are two independent events such that $P(\bar{A} \cap B) = 2/15$ and $P(A \cap \bar{B}) = 1/6$, then $P(B)$ is:

(a) 1/5 (b) 1/6

(c) 4/5 (d) 5/6

4. If A and B are two events, the probability that exactly one of them occurs is given by:

(a) $P(A) + P(B) - 2P(A \cap B)$

(b) $P(A \cap \bar{B}) + P(\bar{A} \cap B)$

(c) $P(A \cup B) - P(A \cap B)$

(d) $P(\bar{A}) + P(\bar{B}) - 2P(\bar{A} \cap \bar{B})$

5. If $\bar{E}$ and $\bar{F}$ are the complementary events of events E and F respectively and if 0 < P (F) < 1, then:

(a) $P(E/F) + P(\bar{E}/F) = 1$

(b) $P(E/F) + P(E/\bar{F}) = 1$

(c) $P(\bar{E}/F) + P(E/\bar{F}) = 1$

(d) $P(E/\bar{F}) + P(\bar{E}/\bar{F}) = 1$

6. If A and B are two events. The probability that at most one of A, B occurs is:

(a) $1 - P(A \cap B)$

(b) $P(\bar{A}) + P(\bar{B}) - P(\bar{A} \cap \bar{B})$

(c) $P(\bar{A}) + P(\bar{B}) + P(A \cup B) - 1$

(d) $P(A \cap \bar{B}) + P(\bar{A} \cap B) + P(\bar{A} \cap \bar{B})$

7. The probability of the simultaneous occurrence of two events A and B is p. If the probability that exactly one of A, B occurs is q then:

(a) $P(\bar{A}) + P(\bar{B}) = 2 + 2q - p$

(b) $P(\bar{A}) + P(\bar{B}) = 2 - 2p - q$

(c) $P(A \cap B / A \cup B) = \dfrac{p}{p+q}$

(d) $P(\bar{A} \cap \bar{B}) = 1 - p - q$

8. For two events A and B it is given that $P(A) = P(A/B) = \dfrac{1}{4}$ and $P(B/A) = \dfrac{1}{2}$. Then:

(a) A and B are mutually exclusive events

(b) A and B are independent events

(c) $P(\bar{A}/B) = \dfrac{3}{4}$

(d) $P(\bar{A}/B) = \dfrac{1}{2}$

9. If A and B are two independent events such that $P(A) = \dfrac{1}{4}$ and $P(B) = \dfrac{1}{2}$. Then:

(a) $P(A \cup B) = \dfrac{3}{5}$

(b) $P(A/B) = \dfrac{1}{2}$

(c) $P(A/A \cup B) = \dfrac{2}{5}$

(d) $P\left(A\cap B/\bar{A}\cup\bar{B}\right)=0$

10. If the independent events A and B are such that $0 < P(A) < 1$ and $0 < P(B) < 1$. Then:

(a) A and B are mutually exclusive

(b) A and $\bar{B}$ are independent

(c) $\bar{A}$ and $\bar{B}$ are independent

(d) $P\left(A/B\right)+P\left(\bar{A}/B\right)=1$

11. If A and B are events at the same experiments with P(A) = 0.2, P(B) = 0.5, then maximum value of $P\left(A'\cap B\right)$ is

(a) 1/4 (b) 1/2

(c) 1/8 (d) 1/16

12. The probabilities that a student passes in mathematics, physics and chemistry are m. p and c respectively. Of these subjects, a student has a 75% chance of passing in at least one, a 50% chance of passing in at least one, 50% chance of passing in at least two and a 40% chance of passing in exactly two subjects. Which of the following relations are true?

(a) $p+m+c=\frac{19}{20}$

(b) $p+m+c=\frac{27}{20}$

(c) $pmc=\frac{1}{10}$

(d) $pmc=\frac{1}{4}$

13. A coin is tossed n times. The probability of getting at least one head is greater than that of getting at least two tails by 5/32. Then n is:

(a) 5 (b) 10

(c) 15 (d) None of these

14. A pair of fair dice is rolled together till a sum of either 5 or 7 is obtained, the probability that 5 comes before 7 is

(a) 0.2 (b) 0.3

(c) 0.4 (d) 0.5

15. 'A' can hit the target 3 times out of 5 times, 'B' can hit 2 times out of 5 and C can hit 3 times out of 4. They aim at each other simultaneously. What is the probability that 2 out of 'A', 'B' and 'C' will hit the target?

16. A, B and C in order toss a coin. First one to get a head wins. What are their respective chances of winning?

17. An urn contains 6 white and 4 black balls. A fair die is rolled and that number of balls are chosen from the urn. The probability that the balls selected are white is:

(a) 1/5 (b) 1/6

(c) 1/7 (d) 1/8

18. There are four machines and it is known that exactly two of them are faulty. They are tested, one by one, in a random order till both the faulty machines are identified. Then the probability that only two tests are needed is:

(a) 1/3 (b) 1/6

(c) 1/2 (d) 1/4

19. A biased coin with probability p, $0 < p < 1$ of heads is tossed untill a head appears for the first time. If the probability that the number of tosses required is even is 2/5, then p equals:

(a) 1/3 (b) 2/3

(c) 2/5 (d) 3/5

20. Let $0 < P(A) < 1$, $0 < P(B) < 1$ and $P(A\cup B) = P(A) + P(B) - P(A)P(B)$. Then :

(a) $P(B/A) = P(B) - P(A)$

(b) $P(A^c \cup B^c) = P(A^c) + P(B^c)$

(c) $P(A \cup B)^c = P(A^c) + P(B^c)$

(d) $P(A/B) = P(A)$

Answer Key

1. **(b)**
2. **(c)**
3. **(b,c)**
4. **(a,b,c,d)**
5. (a)
6. **(a,b,c,d)**
7. **(b,c,d)**
8. **(a,c,d)**
9. **(None)**
10. **(b,c,d)**
11. **(b)**
12. **(b,c)**
13. **(a)**
14. **(c)**
15. **(0.45)**
16. **(P(A)=4/7,P(B)=2/7,P(C)=1/7)**
17. **(a)**
18. **(a)**
19. **(a)**
20. **(c,d)**