Sheet – 07: Probability – Union//Intersection//Complement//Independent//Mutually Exclusive

1) What does the union of two sets represent?
   (a) The elements that are in both sets
   (b) The elements that are in either one of the sets or in both
   (c) The elements that are not in either set
   (d) None of the above
2) What does the intersection of two sets represent?
   (a) The elements that are in both sets
   (b) The elements that are in either one of the sets or in both
   (c) The elements that are not in either set
   (d) None of the above
3) What does the complement of a set represent?
   (a) The elements that are in both the set and the universal set
   (b) The elements that are in either the set or the universal set
   (c) The elements that are in the universal set but not in the set
   (d) None of the above
4) What are mutually exclusive events?
   (a) Events that can occur at the same time
   (b) Events that cannot occur at the same time
   (c) Events that have no effect on each other's occurrence
   (d) None of the above
5) What are independent events?
   (a) Events that can occur at the same time
   (b) Events that cannot occur at the same time
   (c) Events that have no effect on each other's occurrence
   (d) None of the above
6) If A and B are mutually exclusive events, what is $(A \cap B)$?
   (a) 0
   (b) 1
   (c) $P(A) * P(B)$
   (d) $P(A) + P(B)$
7) If A and B are independent events, what is $P(A \cap B)$?
   (a) 0
   (b) 1
   (c) $P(A) * P(B)$
   (d) $P(A) + P(B)$
8) If A is an event, what is $P(A')$?
   (a) 0
   (b) 1
   (c) 1 - P(A)
   (d) P(A)
9) If A and B are mutually exclusive events, what is $P(A \cup B)$?
   (a) 0
   (b) 1
   (c) $P(A) * P(B)$
   (d) $P(A) + P(B)$
10) If A and B are independent events, what is P(A ∪ B)?
   (a) $P(A) + P(B)$
   (b) $P(A) * P(B)$
   (c) $P(A) + P(B) - P(A) * P(B)$
   (d) None of the above
11) Can two events be both mutually exclusive and independent?
   (a) Yes
   (b) No
12) If A and B are independent events, does the occurrence of A affect the probability of B?
   (a) Yes
   (b) No
13) If A and B are mutually exclusive events, can they both occur at the same time?
   (a) Yes
   (b) No
14) If A is an event, what is the sum of P(A) and P(A')?
   (a) 0
   (b) 1
   (c) P(A)
   (d) P(A')
15) If A and B are independent events, and A occurs, what is the probability that B also occurs?
   (a) 0
   (b) 1
   (c) P(B)
   (d) P(A)
16) John flips a coin and rolls a die. What is the probability that he gets a head on the coin (Event) or a 6 on the die (Event B)?
   (a) P(A) + P(B)
   (b) P(A) * P(B)
   (c) P(A) + P(B) - P(A) * P(B)
   (d) None of the above
17) In a deck of cards, what is the probability of drawing a heart (Event A) or a queen (Event B)?
   (a) P(A) + P(B)
   (b) P(A) * P(B)
   (c) P(A) + P(B) - P(A) * P(B)
   (d) None of the above

18) In a single roll of a die, what is the probability of rolling a 2 (Event A) and rolling an even number (Event B)?
(a) P(A) + P(B)
(b) P(A) * P(B)
(c) 0
(d) None of the above

19) Alice has a bag with 4 red balls and 6 blue balls. She draws one ball at random. What is the probability that she does not draw a red ball (Event A')?
(a) 0.4
(b) 0.6
(c) 1 - P(A)
(d) None of the above

20) Bob has a box with 5 green marbles, 3 yellow marbles, and 2 blue marbles. He draws one marble at random. What is the probability that he draws a green marble (Event A) or a blue marble (Event B)?
(a) P(A) + P(B)
(b) P(A) * P(B)
(c) P(A) + P(B) - P(A) * P(B)
(d) None of the above

21) In a single flip of a coin, what is the probability of getting a head (Event A) and getting a tail (Event B)?
(a) P(A) + P(B)
(b) P(A) * P(B)
(c) 0
(d) None of the above

22) In a single roll of a die, what is the probability of rolling an even number (Event A) and rolling a number less than 4 (Event B)?
(a) P(A) + P(B)
(b) P(A) * P(B)
(c) P(A) + P(B) - P(A) * P(B)
(d) None of the above

23) If it rains on Monday (Event A), the probability that John will carry an umbrella on Tuesday (Event B) is 0.9. If it does not rain on Monday, the probability that John will carry an umbrella on Tuesday is 0.2. Are Events A and B independent?
(a) Yes
(b) No

24) In a single roll of a die, what is the probability of not rolling a 6 (Event A')?
(a) 1/6
(b) 5/6
(c) 1 - P(A)
(d) None of the above

25) In a single flip of a coin, what is the probability of getting a head (Event A) or getting a tail (Event B)?
(a) P(A) + P(B)
(b) P(A) * P(B)
(c) P(A) + P(B) - P(A) * P(B)
(d) None of the above

26) If a card is drawn from a standard deck, what is the probability that it is a king (Event A) and a heart (Event B)?
(a) P(A) + P(B)
(b) P(A) * P(B)
(c) 0
(d) None of the above

27) If a card is drawn from a standard deck, what is the probability that it is a king (Event A) or a heart (Event B)?
(a) P(A) + P(B)
(b) P(A) * P(B)
(c) P(A) + P(B) - P(A) * P(B)
(d) None of the above

28) If a card is drawn from a standard deck, what is the probability that it is not a heart (Event A')?
(a) 1/4
(b) 3/4
(c) 1 - P(A)
(d) None of the above

29) If a coin is flipped twice, what is the probability of getting a head on the first flip (Event A) and getting a tail on the second flip (Event B)?
(a) P(A) + P(B)
(b) P(A) * P(B)
(c) P(A) + P(B) - P(A) * P(B)
(d) None of the above

30) If a coin is flipped twice, are the events of getting a head on the first flip (Event A) and getting a tail on the second flip (Event B) independent?
(a) Yes
(b) No