CHAPTER 13

PROBABILITY

TRUE/ FALSE QUESTIONS

Q No	Question
1	P(A | B) = P(B | A).
2	If events X and Y are independent, then they are also mutually exclusive.
3	The General Addition Rules states that the probability of either event X or event Y occurring is the sum of P(X) with P(Y).
4	If P(A) = 0.3 and P(B) = 0.2 and events A and B are statistically independent, then P(A and B) = 0.06. .
5	If P(A and B) = 0, then either P(A) or P(B) must also be equal to zero.
6	The Multiplication Rule can be derived from the formula for conditional probability.
7	A Venn Diagram can be used to depict mutually exclusive events.
8	A decision tree is one way to represent a sample space.
9	If P(X) = 0.5 and P(Y) = 0.3 and the two events are statistically independent, then P(Y | X) = P(Y).
10	Bayes' Theorem is an extension of the conditional probability concept.
11	If two independent events A and B are given such that P(A) = 0.3 and P(B) = 0.6, then P(A and not B) is 0.18.
12	If $P(A \cap B) = 70\%$ and P(B) = 85%, then P(A/B) is equal to $\frac{14}{17}$.
13	If A is a subset of B and $P(A) \neq 0$, then P(B/A) = 0.
14	If a random variable X has the following probability distribution, then $k = \frac{1}{4}$.
15	If P(A) =0.2 , P(B) =0.3 and $P(A \cap B) = 0.6$, then events A and B independent.
16	A black and a red die are rolled together. The conditional probability of obtaining the sum as 8, given that the red die resulted in a number less than 4 is $\frac{5}{36}$.
17	If E and F are independent events, then E' and F' are also independent events.
18	

X	0	1	2	2	3
P(X)	0	k	2k	$3k^2$	k^2-1

	The probability of a student A passing an examination is $\frac{3}{5}$ and that of student B is $\frac{4}{5}$. Then the probability that only one of them passing the examination is $\frac{3}{25}$.
19	Mother, father and son line up at random for a family picture. If E is the event 'son on one end' and F is the event 'Father in middle', then P(F/E) is $\frac{1}{2}$.
20	A problem in mathematics is given to 3 students whose chances of solving it are $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$. Then the probability that the problem is solve is $\frac{1}{24}$.
21	If A and B are two events such that A $\subset$ B and P(B) ≠ 0 then P(A/B) = $\frac{P(B)}{P(A)}$
22	If A and B are two events such that A $\subset$ B and P(B) ≠ 0 then P(A/B) $\geq$ P(A)
23	If P(A/B) $>$ P(A) Then P(A $\cap$ B) $<$ P(A).P(B)
24	If P(A/B) $>$ P(A) Then P(B/A) $>$ P(B)
25	In a box containing 100 bulbs, 10 are defective. The probability that out of a sample of 5 bulbs, none is defective is $(\frac{9}{10})^5$
26	If A and B are two independent events. Then P(A $\cap$ B) = P(A).P(B)
27	If P(A) = $\frac{1}{2}$, P(B) = 0 Then P(A/B) is not defined .
28	If A and B are two events such that P(A/B) = P(B/A), Then P(A) = P(B)
29	

	Let E and F be two events with $P(E) = \frac{3}{5}$, $P(F) = \frac{3}{10}$ and $P(E \cap F) = \frac{1}{5}$ Then, E and F are independent events.
30	An urn contains 5 red and 2black balls. Two balls are randomly selected. let X represents the number of black balls .then possible values of X are 0, 1 , 2, 3.
31	The chance of getting a doublet with two dice is 1/6
32	A coin is tossed 4 times. Then the probability that at least one head comes up is 15/16
33	If the events E and F are independent then so are the events E and F'
34	If A and B are two independent events, then the probability of occurrence of at least one of A and B is given by 1 – P(A)P(B)
35	Probability that A speaks truth is 4/5. A coin is tossed. A reports that head appears. The probability that actually there was head is 2/5
36	The probability that a leap year will have 53 Fridays or 53 Saturdays is 3/7
37	A box contains 10 good articles and 6 with defects. One item is drawn at random. The probability that it is either good or has a defect is 1.
38	A die is thrown and a card is selected at random from a deck of 52 playing cards. The probability of getting an even number of the die and a spade card is 1/8
39	Assume that in a family, each child is equally likely to be a boy or a girl. A family with three children is chosen at random. The probability that the eldest child is a girl given that the family has at least one girl is 2/3
40	If two events are independent, then they must be mutually exclusive.
41	Let A and B are two independent events. Then $P(A \cap B) = P(A) + P(B)$ (a) T (b) F
42	Three events A, B and C are said to be independent if $P(A \cap B \cap C) = P(A)P(B)P(C)$ (a) T (b) F.
43	Two independent events are always mutually exclusive. (a) T (b) F
44	If A and B are two independent events then P(A and B) = P(A).P(B) (a) T (b) F
45	If A and B′ are independent events, then $P(A' \cup B) = 1 – P(A) P(B')$ (a) T (b) F
46	Let A and B be two events. If P(A | B) = P(A), then A is independent of B. (a) T (b) F
47	If A and B are such that $P(A' \cup B') = 2/3$ and $P(A \cup B) = 5/9$, then P(A') + P(B') = 7/9 (a) T (b) F
48	A die is thrown. If E is the event 'the number appearing is a multiple of 3' and F be the event 'the number appearing is even' then E and F are independent?

	(a) T (b) F
49	The probability of obtaining an even prime number on each die, when a pair of dice is rolled is 1/12. (a) T (b) F
50	If E and F are two events associated with the same sample space of a random experiment, the conditional probability of the event E given that F has occurred. I.e. P(E|F) is given by $P(E\|F)=\frac{P(E \cup F)}{P(F)}$, provided $P(F) \neq 0$.
51	If A and B are any two events of a sample space S and F is an event of S such that $P(F) \neq 0$, then $P((A \cup B)\|F)= P(A \mid F)+ P(B \mid F) - P((A \cap B)\mid F)$.
52	$P(E'\|F)= 1+P(E\|F)$.
53	If $P(A) = \frac{7}{13}$, $P(B)= \frac{9}{13}$ and $P(A \cap B) = \frac{4}{13}$, then $P(A\|B)=\frac{4}{9}$.
54	If $P(A)=\frac{1}{2}$, $P(B)=0$, then $P(A\|B)$ is 0.
55	A die is thrown. If E is the event ' the number appearing is a multiple of 3' and F be the event ' the number appearing is even' , then E and F are independent events.
56	An urn contains 10 black and 5 white balls. Two balls are drawn from the urn one after the other without replacement. Then the probability that both drawn balls are black is $\frac{5}{7}$.
57	A family has two children. The probability that both the children are boys given that at least one of them is a boy is $\frac{1}{3}$.
58	Let $P(A)>0$ and $P(B)>0$.then A and B can be both mutually exclusive and independent.

KEY/ANSWER

(TRUE / FALSE Questions)

Q No	Answer
1	False
2	False
3	False
4	True
5	False
6	True
7	True
8	True
9	True
10	True
11	False. Correct answer is 0.12
12	True
13	False. Correct answer is 1.
14	True
15	False. A and B are not Independent.
16	False. Correct answer is $\frac{1}{9}$.
17	True
18	False. Correct answer is $\frac{11}{25}$.
19	True
20	False. Correct answer is $\frac{1}{4}$.
21	FALSE
22	TRUE
23	FALSE
24	TRUE
25	TRUE
26	

	TRUE
27	TRUE
28	TRUE
29	FALSE
30	FALSE
31	TRUE
32	TRUE
33	TRUE
34	FALSE
35	FALSE
36	TRUE
37	TRUE
38	TRUE
39	FALSE
40	FALSE
41	FALSE
42	FALSE
43	FALSE
44	TRUE
45	TRUE
46	TRUE
47	FALSE
48	TRUE
49	FALSE
50	FALSE
51	TRUE
52	FALSE
53	TRUE
54	FALSE
55	TRUE
56	FALSE
57	TRUE
58	FALSE

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