PROBABILITY

RANDOM VARIABLE & IT PROBABILITY DISTRIBUTION

EXERCISE

Q.1 In a month, with a maximum of 31 days, let X represent the number of days. Is X a discrete random variable?

(a) True (b) False

Q.2 Identify which of the following is a continuous random variable.

(a) Number of kids in a family

(b) Number of planets around the sun

(c) Number of tails tossing a coin four times

(d) Life of an electric fan

Q.3 Determine the probability value of P(X=3) for the discrete random variable X, which takes on values x_1, x_2, x_3, with given probabilities P(X=0)=0, P(X=1) = $\frac{1}{4}$, and P(X=2) = $\frac{1}{4}$.

(a) 1 (b) $\frac{1}{2}$ (c) $\frac{1}{3}$ (d) $\frac{1}{4}$

Q.4 Consider the random variable X, where the probability mass function P(X=x) is provided. Determine the value of K?

x	0	1	2	3
P(X=x)	0	k	2k	3k

(a) $\frac{1}{5}$ (b) $\frac{2}{5}$ (c) $\frac{1}{6}$ (d) $\frac{1}{2}$

Q.5 Consider the random variable X, where the probability mass function P(X=x) is provided. Determine the value of k.

X	0	1	2	3
P(X=x)	0	$\frac{1}{2}$	2k	3k

(a) $\frac{1}{8}$ (b) $\frac{1}{4}$ (c) $\frac{1}{6}$ (d) $\frac{1}{2}$

Q.6 Find the value of c that allows the following function to function as a probability distribution for the discrete random variable x: f(x)=c(x+4), for x=0,1,2,3

(a) $\frac{1}{20}$ (b) $\frac{1}{16}$ (c) $\frac{1}{18}$ (d) $\frac{1}{22}$

Q.7 When rolling a die, what is the probability of obtaining an odd number?

(a) $\frac{1}{8}$ (b) $\frac{1}{6}$ (c) $\frac{1}{2}$ (d) $\frac{1}{4}$

Q.8 Consider the random variable X, where the probability mass function P(X=x) is provided. Determine the value of $P(X \geq 1)$.

X	0	1	2	3
P(X=x)	$\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{8}$	$\frac{1}{4}$

(a) $\frac{5}{7}$ (b) $\frac{7}{8}$ (c) $\frac{3}{8}$ (d) $\frac{8}{9}$

Q.9 Consider the random variable X, where the probability mass function P(X=x) is specified. Find the value of F(1)

X	0	1	2	3	4
P(X=x)	$\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{16}$	$\frac{1}{4}$	$\frac{1}{16}$

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

Q.10 Let X represent the random variable, and the probability mass function is denoted as P(X=x). Determine the value of the cumulative distribution function, F(4).

X	0	1	2	3	4
P(X=x)	$\frac{1}{11}$	$\frac{3}{11}$	$\frac{2}{11}$	$\frac{4}{11}$	$\frac{1}{11}$

(a) $\frac{9}{11}$ (b) 1 (c) $\frac{5}{11}$ (d) $\frac{1}{2}$

Q.11 When rolling a die, what is the likelihood of obtaining an even number?

(a) $\frac{1}{8}$ (b) $\frac{1}{6}$ (c) $\frac{1}{2}$ (d) $\frac{1}{4}$

Q.12 When rolling a die, what is the probability of obtaining a multiple of 3?

(a) $\frac{1}{8}$ (b) $\frac{1}{6}$ (c) $\frac{1}{2}$ (d) $\frac{1}{3}$

Q.13 When rolling a die, what is the probability of obtaining numbers that are multiples of 2?

(a) $\frac{1}{8}$ (b) $\frac{1}{6}$ (c) $\frac{1}{2}$ (d) $\frac{1}{3}$

Q.14 What is the probability of selecting an ace from a deck of cards?

(a) $\frac{1}{8}$ (b) $\frac{1}{6}$ (c) $\frac{1}{2}$ (d) $\frac{1}{13}$

Q.15 What is the probability of selecting a club card from a deck of cards?

(a) $\frac{1}{8}$ (b) $\frac{1}{4}$ (c) $\frac{1}{2}$ (d) $\frac{1}{13}$

ANSWER KEY

1. (a)
2. (d)
3. (b)
4. (c)
5. (a)
6. (d)
7. (c)
8. (b)
9. (d)
10. (b)
11. (c)
12. (d)
13. (c)
14. (d)
15. (b)