

QB365 Question Bank Software Study Materials

Random Variable and Mathematical Expectation 50 Important 1 Marks Questions With Answers (Book Back and Creative)

12th Standard

Business Maths and Statistics

Total Marks : 50

Multiple Choice Question

50 x 1 = 50

- 1) Value which is obtained by multiplying possible values of random variable with probability of occurrence and is equal to weighted average is called _____.
(a) Discrete value (b) Weighted value **(c) Expected value** (d) Cumulative value
- 2) Demand of products per day for three days are 21, 19, 22 units and their respective probabilities are 0.29, 0.40, 0.35. Profit per unit is 0.50 paisa then expected profits for three days are _____.
(a) 21, 19, 22 (b) 21.5, 19.5, 22.5 (c) 0.29, 0.40, 0.35 **(d) 3.045, 3.8, 3.85**
- 3) Probability which explains x is equal to or less than particular value is classified as _____.
(a) discrete probability **(b) cumulative probability** (c) marginal probability (d) continuous probability
- 4) Given $E(X)=5$ and $E(Y)=-2$, then $E(X-Y)$ is _____.
(a) 3 (b) 5 **(c) 7** (d) -2
- 5) A variable that can assume any possible value between two points is called _____.
(a) discrete random variable **(b) continuous random variable** (c) discrete sample space (d) random variable
- 6) A formula or equation used to represent the probability distribution of a continuous random variable is called _____.
(a) probability distribution (b) distribution function **(c) probability density function** (d) mathematical expectation
- 7) If X is a discrete random variable and p(x) is the probability of X, then the expected value of this random variable is equal to _____.
(a) $\sum f(x)$ (b) $\sum [x + f(x)]$ (c) $\sum f(x) + x$ **(d) $\sum xp(x)$**
- 8) Which of the following is not possible in probability distribution?
(a) $\sum p(x) \geq 0$ (b) $\sum p(x) = 1$ (c) $\sum xp(x) = 2$ **(d) $p(x) = -0.5$**
- 9) If c is a constant, then $E(c)$ is _____.
(a) 0 (b) 1 (c) c f (c) **(d) c**
- 10) A discrete probability distribution may be represented by _____.
(a) table (b) graph (c) mathematical equation **(d) all of these**
- 11) A probability density function may be represented by _____.
(a) table (b) graph (c) mathematical equation **(d) both (b) and (c)**
- 12) If c is a constant in a continuous probability distribution, then $p(x = c)$ is always equal to _____.
(a) zero (b) one (c) negative (d) does not exist
- 13) $E[X-E(X)]$ is equal to _____.
(a) $E(X)$ (b) $V(X)$ **(c) 0** (d) $E(X)-X$
- 14) $E[X-E(X)]^2$ is _____.

(a) $E(X)$ (b) $E(X^2)$ (c) $V(X)$ (d) S.D(X)

15) If the random variable takes negative values, then the negative values will have _____.

(a) **positive probabilities** (b) negative probabilities (c) constant probabilities (d) difficult to tell

16) If we have $f(x)=2x$, $0 \leq x \leq 1$, then $f(x)$ is a _____.

(a) probability distribution (b) **probability density function** (c) distribution function (d) continuous random variable

17) $\int_{-\infty}^{\infty} f(x)dx$ is always equal to _____.

(a) zero (b) **one** (c) $E(X)$ (d) $f(x)+1$

18) A listing of all the outcomes of an experiment and the probability associated with each outcome is called _____.

(a) **probability distribution** (b) probability density function (c) attributes (d) distribution function

19) Which one is not an example of random experiment?

(a) A coin is tossed and the outcome is either a head or a tail (b) A six-sided die is rolled

(c) Some number of persons will be admitted to a hospital emergency room during any hour

(d) **All medical insurance claims received by a company in a given year**

20) A set of numerical values assigned to a sample space is called _____.

(a) random sample (b) **random variable** (c) random numbers (d) random experiment

21) A variable which can assume finite or countably infinite number of values is known as _____.

(a) continuous (b) **discrete** (c) qualitative (d) none of them

22) The probability function of a random variable is defined as

X=x	-1	-2	0	1	2
P(x)	k	2k	3k	4k	5k

Then k is equal to _____.

(a) zero (b) $\frac{1}{4}$ (c) **$\frac{1}{15}$** (d) one

23) If $p(x) = \frac{1}{10}$, $c = 10$, then $E(X)$ is _____.

(a) zero (b) $\frac{6}{8}$ (c) **1** (d) -1

24) A discrete probability function $p(x)$ is always _____.

(a) **non-negative** (b) negative (c) one (d) zero

25) In a discrete probability distribution the sum of all the probabilities is always equal to _____.

(a) zero (b) **one** (c) minimum (d) maximum

26) An expected value of a random variable is equal to it's _____.

(a) variance (b) standard deviation (c) **mean** (d) covariance

27) A discrete probability function $p(x)$ is always non-negative and always lies between _____.

(a) 0 and ∞ (b) **0 and 1** (c) -1 and +1 (d) $-\infty$ and $+\infty$

28) The probability density function $p(x)$ cannot exceed _____.

(a) zero (b) **one** (c) mean (d) infinity

29) The height of persons in a country is a random variable of the type _____.

(a) discrete random variable (b) **continuous random variable** (c) both (a) and (b) (d) neither (a) nor (b)

30) The distribution function $F(x)$ is equal to _____.

- (a) $P(X = x)$ (b) $P(X \leq x)$ (c) $P(X \geq x)$ (d) all of these

31) If $f(x) = \begin{cases} kx^2 & 0 \leq x \leq 1 \\ 0 & \text{elsewhere} \end{cases}$ is a p.d.f. then the value of k is _____

- (a) $\frac{1}{3}$ (b) $\frac{1}{6}$ (c) $\frac{1}{9}$ (d) $\frac{1}{12}$

32) A random variable X has the following probability distribution

X	0	1	2	3	4	5
P(X=x)	$\frac{1}{4}$	$2a$	$3a$	$4a$	$5a$	$\frac{1}{4}$

Then $P(1 \leq X \leq 4)$ is

- (a) $\frac{10}{21}$ (b) $\frac{2}{7}$ (c) $\frac{1}{14}$ (d) $\frac{1}{2}$

33) A random variable X has the following probability mass function

X	-2	3	1
P(X=x)	$\frac{\lambda}{6}$	$\frac{\lambda}{4}$	$\frac{\lambda}{12}$

Then λ is

- (a) 1 (b) 2 (c) 3 (d) 4

34) Given $E(X + c) = 8$ and $E(X - c) = 12$, then the value of c is _____

- (a) -2 (b) 4 (c) -4 (d) 2

35) Variance of the random variable. X is 4, Its mean is 2. Then $E(X^2)$ is _____

- (a) 2 (b) 4 (c) 6 (d) 8

36) If $E(X) = \frac{1}{2}$, $E(X^2) = \frac{1}{4}$, then $V(X)$ is _____

- (a) 0 (b) $\frac{1}{4}$ (c) $\frac{1}{2}$ (d) 1

37) If the p.d.f of a continuous random variable. X is $f(x) = \begin{cases} \frac{x}{2} & 0 \leq x \leq 1 \\ 0 & \text{elsewhere} \end{cases}$, then $E(3X^2 - 2X) =$ _____

- (a) $\frac{2}{3}$ (b) $\frac{4}{3}$ (c) $\frac{10}{3}$ (d) $\frac{7}{3}$

38) If $f(x) = kx(1-x)$, $0 < x < 1$ is a p.d.f. then the value of k is _____.

- (a) $\frac{1}{5}$ (b) $\frac{2}{5}$ (c) $\frac{3}{5}$ (d) 6

39) Two coins are tossed simultaneously. The values of a, b, c in the probability distribution

No of heads	0	1	2
Probability	a	b	c

are _____

- (a) $\frac{1}{3}, \frac{3}{4}, 0$ (b) $0, \frac{3}{4}, \frac{1}{4}$ (c) $\frac{3}{2}, \frac{1}{2}, \frac{1}{4}$ (d) $\frac{1}{4}, \frac{2}{4}, \frac{1}{4}$

40) The following table is the probability distribution of random variable X.

X	1	2	3	4	5	6
P(X)	0.1	$2k$	k	0.2	$3k$	0.1

The value of k is _____.

- (a) 0.2 (b) 0.1 (c) 0.3 (d) 0.4

41) A discrete random variable. X has the probability mass function p(x), then _____ is true.

- (a) $0 \leq P(X) \leq 1$ (b) $P(X) \geq 0$ (c) $P(X) \leq 1$ (d) 0

42) Two coins are tossed simultaneously. The values of a, b, c in the probability distribution

No of heads	0	1	2
Probability	a	b	c

are _____

- (a) $\frac{1}{3}, \frac{3}{4}, 0$ (b) $0, \frac{3}{4}, \frac{1}{4}$ (c) $\frac{3}{2}, \frac{1}{2}, \frac{1}{4}$ (d) $\frac{1}{4}, \frac{2}{4}, \frac{1}{4}$

43) If X is a discrete random variable. then $P(X \geq a) =$ _____.

(a) $P(X)$ (b) $1-P(X \leq a)$ (c) $1-P(X)$ (d) 0

44) A discrete random variable. X has the probability mass function $p(x)$, then _____ is true.

(a) $0 \leq P(X) \leq 1$ (b) $P(X) \geq 0$ (c) $P(X) \leq 1$ (d) 0

45) If $f(x) = \frac{A}{\pi} \frac{1}{16+x^2}$, $-\infty < x < \infty$ continuous random variable X then $A =$ _____

(a) 16 (b) 8 (c) 4 (d) 1

46) A random variable X has the following probability distribution .

X	0	1	2	3	4	5
$P(X = x)$	$1/4$	$2a$	$3a$	$4a$	$5a$	$1/4$

Then $P(1 \leq x \leq 4)$ is _____

(a) $\frac{10}{21}$ (b) $\frac{2}{7}$ (c) $\frac{1}{14}$ (d) $\frac{1}{2}$

47) $\text{Var}(4X + 3)$ is _____

(a) 7 (b) $16 \text{Var}(X)$ (c) 19 (d) 0

48) $\mu_1 =$ _____

(a) 0 (b) $E(X)$ (c) 1 (d) None of these

49) $F(\infty) =$

(a) $-\infty$ (b) ∞ (c) 1 (d) 0

50) The centre of gravity of a density is _____

(a) Median (b) Variance (c) S.D (d) Mean