QB365 Question Bank Software Study Materials

Probability Distributions 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) Normal distribution was invented by _____.

(a) Laplace **(b) De-Moivre** (c) Gauss (d) all the above

2) If X ~ N(9,81) the standard normal variate Z will be _____.

(a) $Z = \frac{X-81}{9}$ (b) $Z = \frac{X-9}{81}$ **(c)** $Z = \frac{X-9}{9}$ (d) $Z = \frac{9-X}{9}$

3) If Z is a standard normal variate, the proportion of items lying between Z = –0.5 and Z = –3.0 is _____.

(a) 0.4987 (b) 0.1915 **(c) 0.3072** (d) 0.3098

4) If X ~ N(μ, σ^2), the maximum probability at the point of inflexion of normal distribution is _____.

(a) $\left(\frac{1}{\sqrt{2\pi}}\right)^{e^{\frac{1}{2}}}$ (b) $\left(\frac{1}{\sqrt{2\pi}}\right)^{e^{\left(-\frac{1}{2}\right)}}$ **(c)** $\left(\frac{1}{\sigma\sqrt{2\pi}}\right)^{e^{\left(\frac{1}{2}\right)}}$ (d) $\left(\frac{1}{\sqrt{2\pi}}\right)$

5) In a parametric distribution the mean is equal to variance is _____.

(a) binomial (b) normal **(c) poisson** (d) all the above

6) In turning out certain toys in a manufacturing company, the average number of defectives is 1%. The probability that the sample of 100 toys there will be 3 defectives is _____.

(a) 0.0613 (b) 0.613 (c) 0.00613 (d) 0.3913

7) The parameters of the normal distribution $f(x) = \left(\frac{1}{\sqrt{72\pi}}\right)\frac{e^{-(x-10)^2}}{72}$ $-\infty < x < \infty$ _____.

(a) (10,6) **(b) (10,36)** (c) (6,10) (d) (36,10)

8) A manufacturer produces switches and experiences that 2 per cent switches are defective. The probability that in a box of 50 switches, there are atmost two defective is _____.

(a) 2.5 e^{-1} (b) e^{-1} (c) $2e^{-1}$ (d) none of the above

9) An experiment succeeds twice as often as it fails. The chance that in the next six trials, there shall be at least four successes is _____.

(a) 240/729 (b) 489/729 **(c) 496/729** (d) 251/729

10) If for a binomial distribution b(n,p) mean = 4 and variance = 4/3, the probability, P(X ≥ 5) is equal to _____.

(a) $(2/3)^6$ (b) $(2/3)^5(1/3)$ (c) $(1/3)^6$ **(d) $4(2/3)^6$**

11) The average percentage of failure in a certain examination is 40. The probability that out of a group of 6 candidates atleast 4 passed in the examination are _____.

(a) 0.5443 (b) 0.4543 (c) 0.5543 (d) 0.4573

12) Forty percent of the passengers who fly on a certain route do not check in any luggage. The planes on this route seat 15 passengers. For a full flight, what is the mean of the number of passengers who do not check in any luggage?

(a) 6.00 (b) 6.45 (c) 7.20 (d) 7.50

13) Which of the following statements is/are true regarding the normal distribution curve?

(a) it is symmetrical and bell shaped curve

(b) it is asymptotic in that each end approaches the horizontal axis but never reaches it

(c) its mean, median and mode are located at the same point **(d) all of the above statements are true.**

14) Which of the following cannot generate a Poisson distribution?

(a) The number of telephone calls received in a ten-minute interval

(b) The number of customers arriving at a petrol station (c) The number of bacteria found in a cubic feet of soil

(d) The number of misprints per page

15) The random variable X is normally distributed with a mean of 70 and a standard deviation of 10. What is the probability that X is between 72 and 84?

(a) 0.683 (b) 0.954 (c) 0.271 **(d) 0.340**

16) The starting annual salaries of newly qualified chartered accountants (CA's) in South Africa follow a normal distribution with a mean of Rs.180,000 and a standard deviation of Rs. 10,000. What is the probability that a randomly selected newly qualified CA will earn between Rs. 165,000 and Rs. 175,000 per annum?

(a) 0.819 **(b) 0.242** (c) 0.286 (d) 0.533

17) In a large statistics class the heights of the students are normally distributed with a mean of 172 cm and a variance of 25 cm. What proportion of students are between 165 cm and 181 cm in height?

(a) 0.954 (b) 0.601 (c) 0.718 **(d) 0.883**

18) A statistical analysis of long-distance telephone calls indicates that the length of these calls is normally distributed with a mean of 240 seconds and a standard deviation of 40 seconds. What proportion of calls lasts less than 180 seconds?

(a) 0.214 (b) 0.094 (c) 0933 **(d) 0.067**

19) Cape town is estimated to have 21% of homes whose owners subscribe to the satelite service, DSTV. If a random sample of your home in taken, what is the probability that all four home subscribe to DSTV?

(a) 0.2100 (b) 0.5000 (c) 0.8791 **(d) 0.0019**

20) Using the standard normal table, the sum of the probabilities to the right of z = 2.18 and to the left of z = -1.75 is _____.

(a) 0.4854 (b) 0.4599 (c) 0.0146 **(d) 0.0547**

21) The time until first failure of a brand of inkjet printers is normally distributed with a mean of 1,500 hours and a standard deviation of 200 hours. What proportion of printers fails before 1000 hours?

(a) 0.0062 (b) 0.0668 (c) 0.8413 (d) 0.0228

22) The weights of newborn human babies are normally distributed with a mean of 3.2 kg and a standard deviation of 1.1 kg. What is the probability that a randomly selected newborn baby weighs less than 2.0 kg?

(a) 0.138 (b) 0.428 (c) 0.766 (d) 0.262

23) Monthly expenditure on their credit cards, by credit card holders from a certain bank, follows a normal distribution with a mean of Rs. 1,295.00 and a standard deviation of Rs. 750.00. What proportion of credit card holders spend more than Rs. 1,500.00 on their credit cards per month?

(a) 0.487 **(b) 0.392** (c) 0.500 (d) 0.791

24) Let z be a standard normal variable. If the area to the right of z is 0.8413, then the value of z must be: _____.

(a) 1.00 **(b) -1.00** (c) 0.00 (d) -0.41

25) If the area to the left of a value of z (z has a standard normal distribution) is 0.0793, what is the value of z?

(a) -1.41 (b) 1.41 (c) -2.25 (d) 2.25

26) If P(Z > z) = 0.8508 what is the value of z (z has a standard normal distribution)?

(a) –0.48 (b) 0.48 **(c) -1.04** (d) 1.04

27) If P(Z > z) = 0.5832 what is the value of z (z has a standard normal distribution)?

(a) -0.48 (b) 0.48 (c) 1.04 **(d) -0.21**

28) In a binomial distribution, the probability of success is twice as that of failure. Then out of 4 trials, the probability of no success is _____.

(a) 16/81 (b) 1/16 (c) 2/27 **(d) 1/81**

29) The probability that a normal variate X lies in the interval (μ-σ, μ+σ) is _____

(a) 0.0027 (b) 0.9973 **(c) 0.6826** (d) 0.9544

30) For a normal distribution if the mean is m, mode is n and median is m, then _____

(a) $m > m_1 > m_0$ (b) $m < m_1 < m_0$ (c) $m \neq m_1 \times m_0$ **(d) $m = m_1 = m_0$**

31) The probability that a person will hit a target in shooting practice is 0.3. If he shoots 10 times, the probability that he hits the target is _____

(a) 1 **(b) $1-(0.7)^{10}$** (c) $(0.7)^{10}$ (d) $(0.3)^{10}$

32) The variance of a binomial distribution is _____

(a) equal to its mean **(b) less than its mean** (c) greater than its mean (d) none

33) If the mean is λ and variance is σ^2 in a Poisson distribution, then

(a) $\lambda = \frac{\sigma^2}{2}$ (b) $\sigma^2=\frac{\lambda}{2}$ **(c) $\lambda=\sigma^2$** (d) $\sigma^2=\lambda$

34) In a binomial distribution if n = 5, p(x = 3) = 2. p(x = 2), then p = _____

(a) 2q (b) 2p (c) q (d) $\frac{2q}{3}$

35) For a standard normal distribution, the mean and variance are _____

(a) μ,σ^2 (b) μ,σ **(c) 0,1** (d) 1,1

36) The normal distribution curve is _____

(a) bimodal (b) Multimodal **(c) unimodal** (d) no mode

37) In 5 throws of a die, getting 1 or 2 is a success. The mean number of success is _____

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

38) The mean of a binomial distribution is 5 and its standard deviation is 2. Then the value of n and p are _____

(a) $\left(\frac{4}{5}, 25\right)$ (b) $\left(25, \frac{4}{5}\right)$ (c) $\left(\frac{1}{5}, 25\right)$ **(d)** $\left(25, \frac{1}{5}\right)$

39) If in a poisson distribution P (X - 0) = k, then the variance is _____

(a) $\log \frac{1}{k}$ (b) log k (c) e' (d) $\frac{1}{k}$

40) If f (x) is a p.d.f of a normal distribution with mean μ then $\int f(x)dx =$ _____

(a) 1 (b) 0.5 (c) 0 (d) 0.25

41) \(P(\mu-\sigma _____

(a) 0.6826 (b) 0.9544 (c) 0.9973 (d) 1

42) $P(\mu - 2\sigma < X < \mu + 2\sigma)$

(a) 0.6826 **(b) 0.9544** (c) 0.9973 (d) 1

43) $P(\mu - 3\sigma < X < \mu + 3\sigma)$

(a) 0.6826 (b) 0.9544 **(c) 0.9973** (d) 1

44) If $X \sim N(\mu, \sigma)$ the standard normal variate is distributed as _____

(a) N (0,0) (b) N (1, 0) **(c) N (0, 1)** (d) N (1, 1)

45) The normal distribution curve is _____

(a) Binomial **(b) Unimodal** (c) Skewed (d) None of these

46) If X is a poisson variate with P (X = 1) = P (X = 2), the mean of the poisson variate is equal to _____

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

47) If $X - N\left(\mu, \sigma^2\right)$, the points of inflexion of normal distribution curve are _____

(a) $\pm\mu$ **(b)** $\mu \pm \sigma$ (c) $\sigma - \mu$ (d) $\mu \pm 2\sigma$

48) For a binomial variate X, if n = 3 and $P(X = 1) = \frac{3}{4}P(X = 3)$, then $p =$_____

(a) $\frac{4}{5}$ (b) $\frac{1}{5}$ (c) $\frac{1}{3}$ **(d)** $\frac{2}{3}$

49) For Binomial Distribution

(a) Mean = Median **(b) Mean > Variance** (c) Mean < Variance (d) Mean = S.D

50) Which of the following probability distribution follows Bernoulli's trails?

(a) Normal (b) Poisson **(c) Binomial** (d) All these