

KATHMANDU UNIVERSITY
End Semester Examination [C]
January 2025

Marks Scored:

Level : B.Sc./B.Tech.

Year : I

Exam Roll No. :

Time: 30 mins.

Registration No.:

Course : MATH 102

Semester : II

F. M. : 20

Date 08 JAN 2025

SECTION "A"

[10Q. \times 1 = 10 marks]

Fill in the blank space(s) by writing the most appropriate word(s) or symbol(s).

1. The formula for calculation of Pearson's coefficient of skewness is _____.
2. Out of two events A and B, the probability of occurrence of A only without B is denoted as _____.
3. The variance of a random variable X, in terms of its expectation, i.e., $E(X)$ is given by $V(X) =$ _____.
4. Poisson distribution can be considered as the limiting case of binomial distribution $B(n, p)$ when number of trials is _____.
5. If $X \sim N(\mu, \sigma^2)$ then $P(X \leq x)$ is obtained by using $P(Z \leq$ _____).
6. The probability curve of _____ distribution is symmetric.
7. In random sampling from a $N(\mu, \sigma^2)$ population, the expected value of sample mean, i.e., $E(\bar{X})$ is equal to _____.
8. A postulated statement about population parameter is called a _____.
9. In inference procedure, when population variance is unknown but sample is large enough, then _____ distribution is preferred.
10. _____ is the term used to describe the degree of relationship between two variables.

SECTION "B"

[10 Q. × 1 = 10 marks]

Fill in the blank space(s), **DO NOT TICK**, by selecting the most appropriate answers from among the given ones.

11. The expression $P(A \cup B)$ describes probability of _____.
 [occurrence of event A and event B
 occurrence of any one or both of the events A and B
 occurrence of exactly one of the two events A and B
 occurrence of event A only without B]
12. If X is a discrete random variable, then $P(X = x)$ is denoted as $p(x)$ and it is called its _____.
 [probability mass function probability density function
 probability distribution function cumulative distribution function]
13. In _____ distribution mean and variance are always equal.
 [Binomial distribution Poisson distribution
 Hypergeometric distribution Normal distribution]
14. If $X \sim N(\mu, \sigma^2)$, then $X - \mu$ has _____ distribution
 [$N(0, \sigma^2)$ $N(\mu, 1)$ $N(0, 1)$ $N(1, \sigma^2)$]
15. For $X \sim N(\mu, \sigma^2)$ distribution, $P(X < \mu) =$ _____.
 [0.6826 0.5 0.9976 1]
16. Total number of ways of selecting a sample of 2 units from a population of size 5 by simple random sampling with replacement method is _____.
 [5 25 10 7]
17. The expression for upper-sided confidence interval for population mean when population variance is not known and sample is small is _____
 [$P\left(\mu \leq \bar{X} + Z_{\alpha} \cdot \frac{\sigma}{\sqrt{n}}\right) = 1 - \alpha$ $P\left(\mu \geq \bar{X} - Z_{\alpha} \cdot \frac{\sigma}{\sqrt{n}}\right) = 1 - \alpha$
 $P\left(\mu \leq \bar{X} + t_{\alpha, n-1} \cdot \frac{\sigma}{\sqrt{n}}\right) = 1 - \alpha$ $P\left(\mu \leq \bar{X} - t_{\alpha, n-1} \cdot \frac{\sigma}{\sqrt{n}}\right) = 1 - \alpha$]
18. In 'Test of hypothesis' studies, Type II error means error committed in _____.
 [rejecting null hypothesis when it is true accepting alternative hypothesis when it is true
 accepting null hypothesis when it is false accepting null hypothesis when it is true]
19. In simple linear regression model given by $y = \alpha + \beta x$, the value of α measures _____.
 [the value of 'y' when 'x' is nullified.
 the change in value of 'x' for unit change in the value of 'y'
 the change in value of 'y' for unit change in the value of 'x'
 the value of 'x' when 'y' is nullified.]
20. If the value of correlation coefficient between two variables is observed to be -0.9 , then it indicates _____
 [weak negative correlation strong negative correlation
 perfect negative correlation no correlation]