

Note: There are three sections in this paper i.e. Section A, B & C.

VERSION : A

Time Allowed: 20 Minutes

"Section-A"

Marks: 15

INSTRUCTIONS:

- Attempt this section on the MCOs Answer Sheet only.
- Use black ball point or marker for shading only one circle for correct option of a question.
- No mark will be awarded for cutting, erasing, over writing and multiple circles shading.

Q. 1. Choose the correct option i.e. A,B,C, or D.

1. The mean deviation for a normal distribution is approximately $\frac{4}{5}$ times of its
 - (A) Variance
 - (B) Standard deviation
 - (C) Median
 - (D) None of these
2. The odd order moments about mean for a normal distribution are all equal to
 - (A) 1
 - (B) 0
 - (C) Both A and B
 - (D) None of these
3. The difference between the population mean μ and sample mean \bar{x} is
 - (A) Sampling error
 - (B) Non Sampling error
 - (C) Parameter
 - (D) None of these
4. A population characteristic such as population mean is called a.....
 - (A) Statistic
 - (B) Sample
 - (C) Parameter
 - (D) None of these
5. Random variables used to estimate population parameter are called
 - (A) Estimates
 - (B) Estimators
 - (C) Covariate
 - (D) None of these
6. A hypothesis that does not completely specify the values of the population parameter is referred to as ...
 - (A) Null hypothesis
 - (B) Simple hypothesis
 - (C) Alternative hypothesis
 - (D) Composite hypothesis
7. In the equation $\hat{y} = a + b x$, the "a" stands for the
 - (A) Coefficient of correlation
 - (B) Slope of the regression line
 - (C) Intercept of the regression line
 - (D) None of these
8. The value of the coefficient of correlation "r" is always between
 - (A) -1 and 0
 - (B) 0 and + 1
 - (C) -1 and + 1
 - (D) None of these
9. Relationship between two categorical variables is called
 - (A) Regression
 - (B) Association
 - (C) Correlation
 - (D) None of these
10. The rank correlation is used to measure the relation between two
 - (A) Qualitative variables
 - (B) Quantitative variables
 - (C) Both A and B
 - (D) None of these
11. For a 4×3 contingency table the degrees of freedom for the Pearson's χ^2 test is
 - (A) 6
 - (B) 3
 - (C) 4
 - (D) 12
12. Given the numbers 2, 4, 6, 7, 8, 9, the semi averages are given as
 - (A) (4, 7)
 - (B) (6, 8)
 - (C) (4, 8)
 - (D) None of these
13. Fluctuations that are accidental and are due to unforeseen events are called
 - (A) Irregular fluctuations
 - (B) Cyclical fluctuations
 - (C) Seasonal variations
 - (D) None of these
14. The is the brain of the Computer.
 - (A) Memory
 - (B) Input device
 - (C) Processor
 - (D) None of these
15. The binary number system has base 2, with only two digits
 - (A) 0 and 1
 - (B) 1 and 2
 - (C) -1 and 0
 - (D) None of these

"Section-B"

Marks: 40

Q. 2. Write short answers of any Ten (10) of the following parts. Each part carries equal marks.

- (i) What are some important properties of the normal distribution?
- (ii) Let x be a normal random variable with mean 46 and standard deviation 4. Find the following probabilities.
 - (i) $P(x > 48)$
 - (ii) $P(x < 42)$
- (iii) Differentiate between statistic and parameter by giving examples.
- (iv) Describe the properties of the sampling distribution of the sample mean.
- (v) What is the procedure for testing hypothesis about mean of a normal population whose variance σ^2 is known?
- (vi) Given $n = 25$, $\bar{x} = 40$, $\sigma = 4$. Provide a 95 % confidence interval for population mean " μ ".
- (vii) Differentiate between regression and correlation.
- (viii) Describe some important properties of the correlation coefficient.
- (ix) Find regression equation of y on x for the following data:
 $n = 5$, $\sum x = 325$, $\sum y = 580$, $\sum xy = 37735$, $\sum x^2 = 21143$
- (x) What is qualitative or categorical data? Explain by giving two examples.
- (xi) Describe briefly any two different components of time series.
- (xii) Draw the trend line by semi average method from the following time series.

Year	1984	1985	1986	1987	1988	1989	1990	1991
Value	50	44	53	59	49	69	60	55

(xiii) Convert the following to the required base number.

- (i) $(716)_{10} = (?)_2$
- (ii) $(101100101)_2 = (?)_{10}$

"Section-C"

Marks: 20

Note:- Answer any Two (2) questions. Each question carries equal marks.

Q. 3. A population consists of values 2, 4 and 6. Draw all possible samples of size 2 with replacement. Construct sampling distribution of the sample mean. Show that.

$$(i) \mu_{\bar{x}} = \mu \quad (ii) \sigma_{\bar{x}}^2 = \frac{\sigma^2}{n}$$

Q. 4. A random sample of size 36 is taken from a normal population with a known variance $\sigma^2 = 25$. If the sample mean $\bar{x} = 42$, Test the null hypothesis $H_0: \mu = 45$ against $H_1: \mu < 45$. Use $\alpha = 0.05$.

Q. 5. Calculate coefficient of correlation between the marks obtained by students in the subjects of Maths (x) and Statistics (y).

Marks in Maths (x)	32	50	40	55	30	25	60
Marks in Statistics (y)	28	35	25	23	30	32	21