Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.

Q.No.1

(1) In standard normal distribution, mean is:

(A) 0   (B) 1   (C) 2   (D) 3

(2) Normal distribution is:

(A) Bi-modal   (B) Tri-modal   (C) Multi-modal   (D) Uni-modal

(3) In normal distribution, the area above the third quartile is:

(A) 75%   (B) 30%   (C) 25%   (D) 70%

(4) Complete list of sampling units is called:

(A) Sampling frame   (B) Sample design   (C) Sampled population   (D) Target population

(5) If sampling is done with replacement, then total number of possible samples are:

(A) $^{N}C_n$ (B) $^{N}P_n$ (C) n^{N} (D) N^{n}

(6) Probability distribution of any statistic is called:

(A) Sampling distribution   (B) Population distribution
(C) Frequency distribution   (D) Sample distribution

(7) A specific value calculated from sample is called:

(A) Estimator   (B) Estimate   (C) Estimation   (D) Bias

(8) If $E(\hat{\theta}) = \theta$ then estimator $\hat{\theta}$ is said to be _____ for parameter θ.

(A) Biased   (B) Unbiased   (C) Consistent   (D) Efficient

(9) Rejecting H_0 when H_0 is true is called:

(A) No error   (B) Type II error   (C) Type I error   (D) α

(10) Which of the followings is a simple hypothesis? if $\theta_0 = 15$

(A) $\theta < \theta_0$ (B) $\theta > \theta_0$ (C) $\theta \neq \theta_0$ (D) $\theta = \theta_0$

(11) If $\sum y = 96$ and $n = 8$, if $b = 0$ then value of "a" is:

(A) 10   (B) 11   (C) 12   (D) 13

(12) The independent variable is also called:

(A) Regressor   (B) Regressand   (C) Predictand   (D) Explained

(13) The value of coefficient of correlation lies between:

(A) −1 and 0   (B) −1 and +1   (C) 0 and +1   (D) −2 and +1

(14) The value of χ^2 statistic is always:

(A) Zero   (B) Less than zero   (C) Unity   (D) Positive

(15) The characteristic which varies in quality from one individual to another is called:

(A) Variable   (B) Attribute   (C) Statistic   (D) Parameter

(16) The systematic component of time series which follows regular pattern of variation is called:

(A) Signal   (B) Noise   (C) Error   (D) Model

(17) Decomposition of time series is called:

(A) De-trending   (B) Noise   (C) Analysis of time series   (D) None

TIME ALLOWED: 2.40 Hours   **SUBJECIVE**   MAXIMUM MARKS: 68

NOTE: Write same question number and its part number in answer book, as given in the question paper.

SECTION-I

2.   **Write short answers to any eight parts.** $8 \times 2 = 16$

(i)   Define normal probability distribution.

(ii)   Write any four properties of normal distribution.

(iii)   In a normal distribution, mean is 100 and standard deviation is 10. Find mean deviation.

(iv)   What is the relationship between quartile deviation and standard deviation of normal distribution?

(v)   Write the equation of normal curve with mean μ and standard deviation 5.

(vi)   Find $p(z > 1.5)$

(vii)   What is meant by interval estimation?

(viii)   Define hypothesis.

(ix)   Distinguish between critical region and acceptance region.

(x)   Describe one tail test and show it graphically on the answer sheet.

(xi)   Given $\mu = 5$, $n = 9$, $\overline{X} = 2$, $Z_c = -2$. Find δ.

(xii)   Define type – I error.

3.   **Write short answers to any eight parts.** $8 \times 2 = 16$

(i)   Define Sampling.

(ii)   Write any four advantages of sampling.

(iii)   Define Standard Error.

(iv)   Define Sampling frame.

(v)   What is the difference between Parameter and Statistic?

(vi)   Write the properties of sampling distribution of sample means.

(vii)   Define Dependent variable.

(viii)   What is Simple Linear Regression?

(ix)   Write any two properties of coefficient of correlation $'r'$.

(x)   Define Negative correlation.

(xi)   Given $r = 0.8$, $S_{XY} = 20$, $S_X = 4$ then find S_Y

(xii)   What is regression analysis?

4.   **Write short answers to any six parts.** $6 \times 2 = 12$

(i)   What is meant by independence of attributes?

(ii)   What is the relation between two attributes if $Q = +1$?

(iii)   Differentiate between class and class frequency.

(iv)   Explain the term contingency table.

(v)   Differentiate between Historigram and Histogram.

(vi)   What are Seasonal Variation?

(vii)   Differentiate between Signal and Noise.

(viii)   Define method of Semi-Average.

(ix)   Write down phases of cyclical variation.

NOTE: **Attempt any three questions.**   3 × 8 = 24

5.(a)   Find area under the normal curve in each of the following cases: 4
(i) Between $Z = -0.46$ and $Z = 2.21$
(ii) Between $Z = 0.81$ and $Z = 1.94$

(b)   In a normal distribution mean = 60 and S.D = 10.
Find the area   (i) more than 75   (ii) between 50 and 70   4

6.(a)   A population contains 1, 3, 5 values. Take all possible samples of size 2 with replacement
from this population. Construct a sampling distribution of sample means and sample variances.   4

(b)   From a population 9 and 3
(i) Find all possible samples of size 3 with replacement and compute mean of each sample.
(ii) Make the sampling distribution of $\bar{X}$ and find its mean and variance.   4

7.(a)   Find a 90% confidence interval for the mean of a normal population with $\sigma = 3$,
given the sample as 2.3, −0.2, −0.6, −0.9   4

(b)   In a random sample of 1000 houses in a certain city, 618 own color T.V. sets. Is this sufficient
evidence to conclude that $\frac{2}{3}$ of the houses in this city have color T.V. sets? Use $\alpha = 0.02$ 4

8.(a)   Estimate the regression line Y on X for the following data: 4

X	6	9	12	14
Y	31	27	29	47

(b)   For a sample of 8 pairs of observations, we have
$\sum X = 20$, $\sum Y = 260$, $\sum XY = 3490$, $\sum X^2 = 3144$, $\sum Y^2 = 29950$
find the coefficient of correlation $'r'$.   4

9.(a)   The following table shows the marks of six candidates in two subjects   4

Candidate	A	B	C	D	E	F
Math x_i	38	62	56	42	59	48
Stat y_i	64	89	84	60	73	69

(i)   Calculate the coefficient of rank correlation.
(ii) Comment on the value of your result.

(b)   Find 4 – Quarter centred moving averages for the following data: 4

	Quarter			
Year	I	II	III	IV
1948	71	72	78	84
1949	72	69	75	79
1950	73	80	85	86