Statistics (Objective Type)

RwP-22

Time: 20 Minutes   **Marks: 17**

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A, B, C & D to each question are given. Which answer you consider correct, fill the corresponding circle A, B, C or D given in front of each question with marker or pen ink on the answer sheet provided.

1.1. If $Y = 2 + 0.6X$, then value of $\hat{Y}$ for X = 0 is:

   (A) 2   (B) 0.6   (C) 0.8   (D) 2.6

2. If $bxy = -0.52$ and $byx = -1.02$ then rxy is:

   (A) 1   (B) 0.73   (C) 0.80   (D) -0.73

3. Dependent variable is also called:

   (A) Regressand   (B) Regressor   (C) Explanatory variable   (D) Predictor

4. For 3×4 contingency table, the degree of freedom will be:

   (A) 12   (B) 6   (C) 3   (D) 9

5. A characteristic which varies in quality is called:

   (A) Quantitative variable   (B) Qualitative variable   (C) Attribute   (D) Both A & B

6. A business cycle has phases:

   (A) 2   (B) 3   (C) 5   (D) 4

7. The graph of time series is called:

   (A) Histogram   (B) Historigram   (C) Pie-chart   (D) Ogive

8. CPU stands for:

   (A) Central plain unit   (B) Central programming unit

   (C) Central processing unit   (D) None of these

9. In a normal distribution, X lies between:

   (A) $-\infty$ and 0 (B) $-\infty$ and ∞ (C) 0 and ∞ (D) 0 and 2

10. In normal distribution the value of β_1 and β_2 are:

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

11. In normal distribution the value of Quartile Deviation is:

   (A) $\frac{2}{3}\sigma$ (B) 0.6745σ (C) Both A & B   (D) 0.7979σ

12. If sampling is done with replacement, number of possible sample is:

   (A) $\overset{N}{\underset{n}{C}}$ (B) $N \times n$ (C) $N + N$ (D) N^n

13. Probability distribution of a sample statistic is called:

   (A) Time   (B) Frequency distribution

   (C) Sampling distribution   (D) None of these

14. Procedure of selecting a sample from population is called:

   (A) Sample   (B) Sampling design   (C) Sampling   (D) None of these

15. 90% confidence interval for the mean is 53.22 and 64.78, then sample Mean is:

   (A) 59   (B) 49   (C) 69   (D) 118

16. If $n = 8$ $\sum X = 120$, $\sum(X - \overline{X})^2 = 302$. Then unbiased estimated value of the population mean is:

   (A) 15   (B) 120   (C) 8   (D) 302

17. Power of test is denoted by:

   (A) $1 - \alpha$ (B) β (C) α (D) $1 - \beta$

Statistics (Essay Type)

Time: 2:40 Hours   Section - I   RwP-22   Marks: 68

2x8 = 16

2- Write short answers of any eight parts from the following.

i. Quartile deviation of a normal distribution is 3.3725. Find the approximate value of S.D and M.D.

ii. In a normal distribution $\mu = 9$ *and* $Q_3 = 171$. Find S.D (σ)

iii. In a normal distribution $\mu_4 = 243$. Find μ_2 and μ_3

iv. What is the role of standard deviation σ in the normal curve.

v. What is standard normal variable?

vi. Write any two properties of best estimator.

vii. What is interval estimation?

viii. If $t = 2.3$, $n = 10$, $\mu = 5$, $S = 3$, find $\overline{X}$

ix. Define type II error with example.

x. Define one tailed and two failed tests.

xi. What is a compiler?

xii. Differentiate between hard and soft copy.

2x8 = 16

3- Write short answers of any eight parts from the following.

i. Distinguish between population and sample.

ii. Explain the term sampling frame.

iii. Given n = 25 and $\sigma_{\overline{x}} = 5$ find the value of σ^2.

iv. Given $\mu = 6$, n = 2 and $\sigma^2 = 10.8$ find $E(S^2)$.

v. Define the standard error.

vi. Draw all possible samples of size 3 without replacement from the population 0, 1, 2, 3, 4.

vii. Define dependent variable in regression model.

viii. If a = 130 and b = 3.9 write regression equation of Y on X.

ix. What is meant by Y-intercept "a"?

x. Given Y = 6, 8, 10 and X = 0, 1, 2. Find "b".

xi. Explain the meaning of regression coefficient.

xii. The regression equation of X on Y is $\hat{X} = 5y - 7$ and regression equation of Y on X is $\hat{Y} = 0.1X + 1.7$. Find correlation coefficient.

2x6 = 12

4- Write short answers of any six parts from the following.

i. Define attributes.

ii. Define positive association.

iii. Given (A) = 200, (B) = 800, N = 1000. Find (AB) assuming A and B are independent.

iv. Define the term dichotomy.

v. Name the four methods used to measure the secular trend.

vi. Given Y = 16, 18, 20, 22, 24 and X = -2, -1, 0, 1, 2, and $\hat{Y} = 20 + 2x$, find $\sum \hat{Y}$.

vii. Give two examples of irregular variation.

viii. What is semi – averages method?

ix. What is meant by residual?

Section - II

8 x 3 = 24

NOTE : Answer any three questions from the following.

5.(a) In a normal distribution $Q_1 = 20$ and $Q_3 = 30$ find its Mean and Mean deviation.

(b) Let $X \sim N(30, 25)$. Find (i) P(X>35) (ii) P(X < 22)   04+04

6.(a) Take all possible samples of size 2 with replacement from the population 2, 3, 4, 5.
(i) Calculate means of the samples.
(ii) Construct sampling distribution of means.
(iii) Prove that $\mu_{\overline{X}} = \mu$.

(b) Find unbiased estimates of μ and σ from the sample of values 13, 18, 26, 34, 45 and 48.   04+04

7.(a) A normal population has a variance of 100. A random sample of size 16 selected from the population has a mean of 52.5. Construct the 90% confidence interval estimate of population mean, μ. Interpret the result.

(b) The sex distribution of 98 births reported in a newspaper was 52 boys and 46 girls. Is this consistent with an equal sex division in the population? Use 5% level of significance.   04+04

8.(a) For 9 observations on supply (X) and price (Y) the following data was obtained   04+04
$\sum(x-90) = -25$, $\sum(x-90)^2 = 301$, $\sum(y-127) = 12$, $\sum(y-127)^2 = 1006$, $\sum(x-90)(y-127) = -469$
Obtain the estimated line of regression of X on Y and estimate the supply when the price is Rs.125.

(b) Compute the correlation co-efficient between the variables X and Y represented in the following table.

x	2	4	5	6	8	11
y	18	12	10	8	7	5

9.(a) Given the following data
$(AB) = 110$, $(\alpha B) = 90$,
$(\alpha\beta) = 290$, $(\alpha\beta) = 510$. Discuss association

(b) Obtain the semi-averages trend line and find the trend values from the following data.   04+04

Years	Y
1973	201
1974	238
1975	392
1976	507
1977	484
1978	649
1979	742