STATISTICS   PAPER-II   TIME ALLOWED: 2:40 Hours

MAXIMUM MARKS: 68

SUBJECTIVE

NOTE: - From Section-I, write short answers of any twenty two questions from Question Numbers 1, 2, 3 and 4 and attempt any three questions from section-II. Writ same question number and its part number in the answer book, as given in the question paper.

SECTION-I

Q. No: 2 Write short answers of any eight questions of the following.   8*2=16

(i)   Write down any two properties of Normal Distribution.

(ii)   Write down the probability density function of the Normal distribution.

(iii)   If $x \sim N(50,100)$, then find Quartiles.

(iv)   If $\mu=25$ & $\sigma^2 = 16$, $find$ β_1 & β_2

(v)   If $x \sim N(50,25)$, find the value of "x" for the standardized value of 1.6.

(vi)   Define an estimator.

(vii)   What are different types of estimation?

(viii)   What are the commonly used test-statistics?

(ix)   Differentiate type-I and type-II error.

(x)   Write down the formula of the test statistic "t" for two samples.

(xi)   Differentiate between hard ware & soft ware.

(xii)   What is data processing?

Q. No: 3 write short answers of any eight questions of the following.   8*2=16

(i)   What is regressor?

(ii)   Explain the term Curve Fitting.

(iii)   Write down any two properties of Least Square line.

(iv)   Calculate b_{yx}, if n=100, $\bar{x}$=125, $\bar{y}$=80, $\sum xy$=1007425, $\sum x^2$=1855000.

(v)   Interpret the meaning when r=-1, r=0, r=1.

(vi)   The two least square lines are: $\hat{y} = 20.8 - 0.219x$, $\hat{x} = 16.2 - 0.785y$, calculate r.

(vii)   Discuss types of population

(viii)   What is probability sampling?

(ix)   Define sampling without replacement.

(x)   Explain Stratified random sampling.

(xi)   Define standard error.

(xii)   For an infinite population μ=50, σ^2=250, n=25, find $u_{\bar{x}}$ & $\sigma_{\bar{x}}^2$.

Q. No: 4 write short answers of any six questions of the following.   6*2=12

(i)   Define the terms Signal & Noise.

(ii)   Name the four components of time series.

(iii)   Write the formulas of "a" & "b" in semi-average method.

(iv)   What are the methods of measuring Secular Trend?

(v)   Given $\sum(y - \hat{y})$=0.5, -0.5, 1, -1, 0.5, -0.5. Find sum of squares of residuals.

(vi)   Define time series.

(vii)   Differentiate between variable and attribute.

(viii)   Define co-efficient of Association, also write formula.

(ix)   Find coefficient of rank correlation, $\sum d^2$=99 & n=10.

SECTION-II

Note: Attempt any three questions from this section. $8*3=24$

Q. No: 5

(a)   If $x \sim N(20,25)$, find the area under the normal curve.

(i) Above 30   (ii) Between 30 & 42.

(b)   In a normal distribution, the lower and upper quartiles are 15 and 25 respectively. Find mean and standard deviation.

Q.No:6

(a)   A population consists of four children with ages 2, 4, 6 and 8. Take all possible samples of size n=2 with replacement. Also verify the results

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

(b)   If the size of simple random sample from an infinite population is 55, the variance of the sample mean is 27, what must be the standard error of the sample mean if n=165.

Q.No:7

(a)   A random sample of size 36 is taken from a Normal population with known variance $\sigma^2=25$. If the mean of the sample is 42.6, find 95% confidence interval for the population mean.

(b)   A sample of 400 male students is found to have a mean height of 67.47 inches. Can it be regarded as a simple random sample from a large population with mean height 67.39 with standard deviation of 1.3 inches?

Q.No:8

(a)   A random sample of five pairs of observations (x, y) is given below:

X	3	2	5	1	4
Y	13	9	27	8	18

Determine the least squares linear Regression line $\hat{y}=a+bx$ & estimate "Y" for x=6.

(b)   For a sample of 20 pairs of observations, we have:

$$\bar{x} = 2, \bar{y} = 8, \sum x^2 = 180, \sum y^2 = 3424, \sum xy = 604$$

Calculate the coefficient of Correlation.

Q.No:9

(a)   Find the association Between Injection against typhoid and exemption from attack from the following contingency table.

Attribute	Attacked	Not Attacked
Inoculated	528	25
Not inoculated	790	175

(b)   Determine a trend line by simple moving averages of 5 years from the following data:

Years	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
Values	102	108	130	140	158	180	196	210	220	230

You have four choices for each objective type of question as A, B, C, D. encircle the correct one.

Q.No:1

(i) The mean of the Standard Normal distribution is

(A) 1   (B) <1   (C) >1   (D) Zero

(ii) Normal distribution has parameters

(A) μ (B) μ, σ^2 (C) σ (D) n,p

(iii) Any measure calculated from the population is called

(A) Statistic   (B) Sampling   (C) Parameter   (D)None of these

(iv) The finite population correction factor is

(A) $\frac{n}{N}$ (B) $\frac{N}{n}$ (C) $\frac{N-n}{N-1}$ (D) $\sqrt{\frac{N-n}{N-1}}$

(v) The point estimator of μ is

(A) $\bar{X}$ (B) $\hat{X}$ (C) $\tilde{X}$ (D) S

(vi) If $\sum (x - \bar{X})^2 = 172$ and n=8 then s^2 is

(A) 21.8   (B) 21.7   (C) 21.5   (D)22.5

(vii) which of the following is a simple hypothesis:

(A) $\mu < 30$ (B) $\mu = 30$ (C) $\mu \neq 30$ (D) $\mu > 30$

(viii) The probability of type-I error is denoted by

(A) α (B) β (C) v   (D)1-α

(ix) The simple linear regression coefficient is denoted by

(A) α (B) β (C) Y   (D) $\alpha + \beta$

(x) The coefficient of correlation is equal to:

(A) $b_{yx} * b_{xy}$ (B) $b_{yx} * b_{yx}$ (C) $\sqrt{b_{yx} * b_{xy}}$ (D) none of these

(xi) The range of correlation coefficient "r" is

(A) -1 to zero   (B) -1 to 1   (C) 0 to 1   (D) 0 to ∞

(xii) Two attributes are independent, if

(A) Q=0   (B) Q=1   (C) Q=-1   (D) Q=2

(xiii) (r-1) (c-1) is equal to

(A) n   (B) r   (C) v   (D) Q

(xiv) The eye colour of a person is

Intermediate PART-II

(A) Attribute   (B) Variable   (C) constant   (D) none of these

(xv) The graph of the time series data is called:

(A) Ogive   (B) Historigram   (C) Frequency Polygon   (D) Pie chart

(xvi) wars, Floods, Strikes, Fires are the examples of

(A) Seasonal variations   (B) Cyclical variations   (C) irregular variations   (D) Secular Trend

(xvii) Microsoft Word, Excel and Power point is the example of

(A) Soft ware   (B) Control unit   (C) Main Memory   (D) Hard ware