

SUBJECTIVE

Note: Section I is compulsory. Attempt any Three (3) questions from Section II.

SECTION I

2. Write short answers to any EIGHT (8) questions.

(2 x 8 = 16)

- i- Define Standard Normal random variable.
- ii- Write down two properties of Normal Distribution.
- iii- Describe the normal probability density function.
- iv- If X is $N(20, 5)$. Find the value of the maximum ordinate.
- v- The Variance of Normal Distribution is 4. Find μ .
- vi- Explain the term Estimation.
- vii- What is meant by Critical Region?
- viii- Elaborate one tail test.
- ix- Compute test-statistic 'z' if $\bar{X} = 116$, $\mu = 120$, $\sigma = 15$ and $n = 100$.
- x- Given $s_1^2 = 1.43$, $s_2^2 = 5.21$, $n_1 = 10$, $n_2 = 10$. Compute S_p .
- xi- Explain the term Program.
- xii- Differentiate between low-level and high-level languages.

3. Write short answers to any EIGHT (8) questions:

(2 x 8 = 16)

- i- Given $n = 25$, $\mu = 68.5$, $\sigma = 2.7$ and $N = 1000$, find $\sigma_{\bar{x}}$ and $\mu_{\bar{x}}$ using W.O.R sampling.
- ii- If $n = 400$, $\pi = 0.7$ and $N = 4500$, find μ_p and σ_p^2 using W.O.R sampling.
- iii- What is Sampling?
- iv- Define bias.
- v- What is Sampling Frame?
- vi- Differentiate between stratum and stratification.
- vii- What is regression analysis?
- viii- If $n = 10$, $\Sigma x = 20$, $\Sigma y = 260$, $\Sigma xy = 3490$ and $\Sigma x^2 = 3144$, find b_{yx} .
- ix- Write two assumptions of regression.
- x- Define positive correlation.
- xi- Given, $S_x^2 = 9.1$, $S_y^2 = 9.1$ and $S_{xy} = 1.69$, find correlation co-efficient.
- xii- What is the relation between regression co-efficient and correlation co-efficient?

(2 x 6 = 12)

4. Write short answers to any SIX (6) questions:

- i- Define 2 x 2 contingency table.
- ii- Define Rank correlation.
- iii- What is "degree of freedom"?
- iv- Explain negative association between the attributes.
- v- Define Analysis of Time Series.
- vi- Define Seasonal Variations.
- vii- Given $\Sigma d^2 = 440$, $n = 11$. Find the value of Rank Correlation.
- viii- Define co-efficient of association.
- ix- What does it mean if $Q = 0$, $Q = +1$, $Q = -1$?

SECTION II

- 5- (a) If 'x' is normally distributed with mean = 25 and variance = 16 then find the probabilities 4
 i. $P[x \geq 30]$ ii. $P[x \leq 16]$
 (b) A coin is tossed 400 times. Use the normal approximation to find the probability of obtaining 4
 i. Between 185 and 210 heads ii. Exactly 205 heads

- 6- (a) Take all possible samples of size 2 without replacement from the population 2, 6, 8, 12, 14. 4
 Form the sampling distribution of mean and verify that $\mu_{\bar{x}} = \mu$

- (b) The random variable 'x' has the following probability distribution 4

x	4	5	6	7
P(x)	0.2	0.4	0.3	0.1

Find $\mu_{\bar{x}}$ and $\sigma_{\bar{x}}$ for a random sample of size 36.

- 7- (a) Find 95% confidence interval for μ if a sample of 25 values gave a mean $\bar{X} = 83$. Given that 4
 population Standard Deviation is 7.
 (b) A sample of 12 values from a population gives mean $\bar{X} = 40$ and unbiased estimate of 4
 Variance $S^2 = 2.56$. Test the hypothesis at 5% level of significance that mean in the
 population is 44

- 8- (a) Given the following data : 4
 $n = 100$ $\Sigma x = 5000$ $\Sigma y = 6000$
 $\Sigma xy = 300300$ $\Sigma x^2 = 250400$ $\Sigma y^2 = 360900$

Calculate Regression equation taking 'x' as independent variable.

- (b) For a set of data we have 4
 $\Sigma(x - \bar{x})(y - \bar{y}) = 120$ $S_x = 3$ $\Sigma(y - \bar{y})^2 = 640$ $r = 0.5$

Find the number of pair of values.

- 9- (a) In an investigation about Eye Colour and left or right handedness of a person, the following 4
 results were obtained:

Eye Colour	Handedness	
	Left	Right
Blue	15	85
Brown	20	80

Test the hypothesis that if there is any association between Eye Colour and Handedness at 5% level of significance.

- (b) Calculate 7 days moving averages for the following record of attendance. 4

Week	Days						
	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
I	24	55	29	48	52	55	61
II	27	52	32	43	53	56	65