Roll No. _____

STATISTICS **Intermediate Part-II , Class 12th (1stA 424- IV)** **Paper: II**

Time: 20 Minutes **OBJECTIVE ..... Code: 8187** GUJ-24 **Marks: 17**

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 circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question.

1. 1- Which of the following can be alternative hypothesis H_1?
(A) $\theta \geq \theta_0$ (B) $\theta \leq \theta_0$ (C) $\theta = \theta_0$ (D) $\theta \neq \theta_0$

2- The sale of ice cream in summer is an example of
(A) secular trend (B) cyclical variations (C) seasonal variations (D) irregular variations

3- A sequence which follows regular variations is called
(A) signal (B) noise (C) model (D) trend

4- The limits of the normal distribution are
(A) $-\infty$ to $+\infty$ (B) 0 to ∞ (C) $-\infty$ to 0 (D) 0 to 1

5- If $E(\hat{\theta}) = \theta$, then $\hat{\theta}$ is called
(A) biased estimator (B) positively biased (C) unbiased estimator (D) negatively biased

6- Cursor on the screen can be moved by
(A) Keyboard (B) Mouse (C) Scanner (D) CD Rom

7- The co-efficient of association Q lies between
(A) 0 and +1 (B) –1 and +1 (C) $-\infty$ and +1 (D) $-\infty$ to $+\infty$

8- In the regression equation: y = a + bx, y is called
(A) dependent variable (B) independent variable
(C) qualitative variable (D) continuous variable

9- In simple regression, $\Sigma(Y - \hat{Y})$ is
(A) negative (B) zero (C) positive (D) fractional

10- In a normal distribution, $\mu = 10$ and $\sigma^2 = 25$, the mode is
(A) 5 (B) 25 (C) 100 (D) 10

11- If $\sigma^2 = 5$ and $n = 2$, then $\sigma^2_{\bar{x}}$ is (in case sampling is done with replacement)
(A) 2 (B) 2.5 (C) 3 (D) 5

12- A value calculated from sample data is called
(A) Statistic (B) Parameter (C) Mean (D) Proportion

13- Two types of estimation are
(A) one and two sided (B) point and interval (C) biased and unbiased (D) type–I and type–II

14- If $r_{xy} = -0.84$, then r_{yx} is
(A) 0.42 (B) 0.84 (C) – 0.84 (D) zero

15- In a standard normal distribution, Q_1 is equal to
(A) 0.7979 (B) 0.6745 (C) – 0.6745 (D) – 0.7979

16- The value of χ^2 cannot be
(A) zero (B) positive (C) $+\infty$ (D) negative

17- The sum of frequencies in sampling distribution is equal to
(A) zero (B) 1 (C) population size (D) No. of possible samples

STATISTICS | Intermediate Part-II , Class 12th (1stA 424) | Paper II

Time: 2:40 Hours | GUJ-24 | Marks: 68

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_4 .
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?

4. Write short answers to any SIX (6) questions: **(2 x 6 = 12)**

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 population Standard Deviation is 7. 4

(b) A sample of 12 values from a population gives mean $\bar{X} = 40$ and unbiased estimate of Variance $S^2 = 2.56$. Test the hypothesis at 5% level of significance that mean in the population is 44 4

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 results were obtained: 4

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