

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 more circles will result in zero mark in that question. Attempt as many questions as given in objective type question paper and leave others blank.

- 1- 1- Normal distribution have parameters
(A) three (B) four (C) two (D) one
- 2- In standard normal distribution mean and variance respectively are
(A) 0 & 1 (B) 0 & 3 (C) 0 & 5 (D) 0 & 2
- 3- Mean and variance of a normal distribution are
(A) n, np (B) np, npq (C) μ, σ^2 (D) μ, σ
- 4- Number of observations falling in a sample are called
(A) sample size (B) population size (C) sample frame (D) sample design
- 5- If sampling is done with replacement then total number of possible samples are
(A) N^n (B) ${}^N C_n$ (C) ${}^N P_n$ (D) Nn
- 6- $\mu_{\bar{x}} = \mu$ if sampling is done
(A) with replacement (B) without replacement (C) both A and B (D) neither A nor B
- 7- Any hypothesis which is accepted when null hypothesis is rejected is called
(A) simple (B) composite (C) alternative (D) statistical
- 8- Probability of rejecting H_0 when actually it is true is called
(A) α error (B) β error (C) level of confidence (D) level of significance
- 9- In estimation if we find single value then it is called
(A) interval estimation (B) point estimation
(C) confidence interval (D) interval estimator
- 10- The dependance of one variable to another variable is called
(A) regression (B) correlation (C) association (D) regression
- 11- Correlation co-efficient always lies between
(A) -1 and +1 (B) 0 and 1 (C) $-\infty$ to $+\infty$ (D) 3 and -3
- 12- Interdependance between two quantitative variables is called
(A) correlation (B) regression (C) association (D) estimation
- 13- Two attributes X and Y are called +vely associated
(A) $(XY) \neq \frac{(X)(Y)}{n}$ (B) $(XY) = \frac{(X)(Y)}{n}$ (C) $(X)(Y) > \frac{(X)(Y)}{n}$ (D) $(XY) < \frac{(X)(Y)}{n}$
- 14- Chi-square test is not used if any expected frequency is less than
(A) 10 (B) 5 (C) 3 (D) 15
- 15- The graph of time series is called
(A) histogram (B) historigram (C) ogive (D) pre-diagram
- 16- Damages due to floods, strikes and fires are
(A) irregular (B) regular (C) seasonal (D) cyclical
- 17- Computers which are commonly used in offices are called _____ computers.
(A) super (B) digital (C) analog (D) hybrid

Cuj-12-18

Statistics (New Scheme)
Time: 2:40 Hours

(INTER PART II)-418

PAPER: 11
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 questions:

(2 x 8 = 16)

- i- What are the values of two constants e and π in the equation of normal distribution?
- ii- In normal distribution mean = 40, find median and mode.
- iii- What is relation between binomial distribution and normal distribution?
- iv- Write the equation of normal distribution with mean = 30 and SD = 10.
- v- If X is $N(25, 25)$ find the value of maximum ordinate.
- vi- Define biased estimator.
- vii- Define confidence limits.
- viii- Define level of significance.
- ix- Define region of acceptance.
- x- What is meant by critical region?
- xi- Define hardware and software.
- xii- What is CPU?

3. Write short answers to any Eight questions:

(2 x 8 = 16)

- i- Write any two advantages of sampling.
- ii- What is the term bias in sampling?
- iii- Explain the term probability sampling.
- iv- Give $\pi_1 = \frac{2}{3}$, $n_1 = 2$ and $\pi_2 = \frac{1}{2}$, $n_2 = 2$. Find $\text{var}(\hat{p}_1 - \hat{p}_2)$
- v- Find $\sigma_{\bar{x}}^2$ if $N = 6$, $n = 2$, $\sigma = 4$. For sampling with and without replacement.
- vi- Write any two purposes of sampling.
- vii- Given $b_{yx} = -1.4$ and $b_{xy} = -0.87$. Find (r) .
- viii- Give two properties of coefficient of correlation.
- ix- Given $n = 15$, $S_x = 7.933$, $S_y = 16.627$, $\sum (x - \bar{x})(y - \bar{y}) = 148$ compute b_{yx} .
- x- Define independent variable in regression model.
- xi- Sketch scatter diagram indicating positive correlation.
- xii- What is meant by residual (error) in regression model?

4. Write short answers to any SIX questions:

(2 x 6 = 12)

- i- Define association of attributes.
- ii- What is Rank correlation?
- iii- What is ultimate class frequency?
- iv- What is order of the class?
- v- Determine whether two attributes are independent or associated
 $N = 1024$, $(A) = 144$, $(B) = 384$, $(AB) = 54$
- vi- Define histogram.
- vii- What is meant by analysis of time series?
- viii- Define secular trend.
- ix- Give two examples of seasonal movements.

SECTION II

- 5- (a) In a normal distribution $\mu = 20$ and $\sigma^2 = 16$. Find two points containing the middle 90 % area.
- (b) In a normal distribution lower and upper quartiles are 25 and 35. Find the probability that (i) $P(X < 19)$ (ii) $P(X < 35)$

(Turn over)

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(2)

- 6- (a) If the mean and variance of a population are 20 and 4 respectively, What would be the mean and $S.E(\bar{x})$ if the samples are drawn with replacement of size 5.
- (b) Draw all possible samples of size 3 without replacement from population i.e. 2, 4, 5, 7, 10. Find the sample proportion (\hat{p}) of prime numbers in each sample. Verify that

$$(i) \mu_{\hat{p}} = P \text{ and } \sigma_{\hat{p}}^2 = \frac{Pq}{n} \cdot \frac{N-n}{N-1}$$

- 7- (a) Calculate 95 % confidence interval for population mean. Given that $\sigma^2 = 49$, $n = 25$, $\bar{X} = 83$
- (b) A basket ball player has hit on 80 % of his shots from the floor. If on the next 100 shots he makes 70 baskets, would you say that his shooting has improved $\alpha = 5 \%$

- 8- (a) Given the following information:
 $n = 15$, $\bar{x} = 25$, $\bar{y} = 18$, $\sum (x - \bar{x})^2 = 136$, $\sum (y - \bar{y})^2 = 138$
 $\sum (x - \bar{x})(y - \bar{y}) = 122$

Compute the regression line Y on X and estimate Y when $X = 24$

- (b) Compute the coefficient of correlation between X and Y for the information given in part (a)
- 9- (a) The following table gives the condition at home and condition of the children:

Condition of children	Condition at home	
	Clean	Not clean
Clean	175	143
Fairly clean	136	116
Dirty	125	145

Test for the association between the condition at home and condition of children.

- (b) Compute 3-years moving average from the data given below:

Years	1992	1993	1994	1995	1996
Sales	2.4	2.8	3	3.5	4