(Academic Sessions 2015 – 2017 & 2016 – 2018 )

**STATISTICS** 218-(INTER PART – II) Time Allowed : 20 Minutes
Q. PAPER – II ( Objective Type ) **PAPER CODE = 8185** Maximum Marks : 17

Note : Four possible answers A, B, C and D to each question are given. The choice which you think is correct,
fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling
two or more circles will result in zero mark in that question.

| | | | | | |
|---|---|---|---|---|---|
| 1-1 | In simple linear regression the number of unknowns are : | | | | |
| | (A) One | (B) Two | (C) Three | (D) Four | |
| 2 | The standard deviation of sampling distribution is : | | | | |
| | (A) Dispersion | (B) Difference | (C) Average | (D) Standard error | |
| 3 | A qualitative characteristic is : | | | | |
| | (A) Constant | (B) Quantitative variable | (C) Attribute | (D) None | |
| 4 | In normal distribution the value of constant $\pi$ is : | | | | |
| | (A) $\frac{23}{6}$ | (B) $\frac{22}{7}$ | (C) $\frac{30}{9}$ | (D) $\frac{42}{8}$ | |
| 5 | One byte equals to : | | | | |
| | (A) 8 bits | (B) 4 bits | (C) 7 bits | (D) 13 bits | |
| 6 | P ( type – I error ) is equal to : | | | | |
| | (A) $\alpha$ | (B) $\beta$ | (C) $\theta$ | (D) $1 - \beta$ | |
| 7 | The probability distribution of a statistic is : | | | | |
| | (A) Sampling | (B) Parameter | (C) Data | (D) Sampling distribution | |
| 8 | In normal distribution the value of constant $e$ is : | | | | |
| | (A) 2.7183 | (B) 2.8173 | (C) 2.1792 | (D) 1.2345 | |
| 9 | The value of correlation co-efficient lies between : | | | | |
| | (A) 0 and 1 | (B) – 1 and 0 | (C) – 1 and + 1 | (D) 0 and 2 | |
| 10 | The additive model of time series is : | | | | |
| | (A) $Y = T + C + S + I$ | (B) $Y = TCSI$ | (C) $T - C - S - I$ | (D) $T + C - S - I$ | |
| 11 | The number of degrees of freedom for paired t-test based on n pairs of observation is : | | | | |
| | (A) $2n - 1$ | (B) $n - 2$ | (C) $2(n - 1)$ | (D) $n - 1$ | |
| 12 | The sample is subset of : | | | | |
| | (A) Data | (B) Population | (C) Parameter | (D) Distribution | |
| 13 | In semi average method if number of values is odd then we drop from initial two halves : | | | | |
| | (A) First value | (B) Last value | (C) Middle value | (D) $2^{nd}$ value | |
| 14 | Estimate and estimator are : | | | | |
| | (A) Same | (B) Different | (C) Both A and B | (D) Neither A nor B | |
| 15 | If X is N ( 100 , 64 ) then S.D is : | | | | |
| | (A) 18 | (B) 100 | (C) 8 | (D) 91 | |
| 16 | The signs of regression co-efficients and correlation co-efficient are always : | | | | |
| | (A) Different | (B) Same | (C) Zero | (D) One | |
| 17 | In converting the score 18, 24, 12, 22, 33 to ranks ( assigning rank 1 to highest score ) the rank of score 12 is : | | | | |
| | (A) 4 | (B) 5 | (C) 1 | (D) 3 | |

## SECTION – I

LHR-12-18

**2. Write short answers to any EIGHT (8) questions :**          16

(i) In a normal distribution $Q_1 = 8$ , $Q_3 = 17$. Find the value of mean and mode.

(ii) Write the probability density function of standard normal distribution.

(iii) If $Z \sim N(0,1)$, then find $P\left[|z| < 1.64\right]$

(iv) Write four properties of standard normal distribution.

(v) Find the ordinate of the standard normal curve at $z = -0.84$

(vi) Define interval estimation.

(vii) Differentiate between estimator and estimate.

(viii) What are the assumptions of student's t-Statistic?

(ix) Define level of significance.

(x) Given $\bar{X} = 28$ , $\mu_o = 28$. Find the value of z-score.

(xi) What is computer software?

(xii) What is a compiler?

**3. Write short answers to any EIGHT (8) questions :**          16

(i) What is population?

(ii) What is non-sampling error?

(iii) What is standard error?

(iv) Explain the properties of the sampling distribution of a mean.

(v) Given $N_1 = 3$ , $n_1 = 2$ and $N_2 = 4$ , $n_2 = 2$. If $\sigma_1^2 = \frac{8}{3}$ and $\sigma_2^2 = \frac{5}{4}$  find $\text{var}(\bar{X}_1 - \bar{X}_2)$ when sampling is done without replacement?

(vi) Distinguish between finite and infinite population.

(vii) Sketch scatter diagram indicating negative correlation.

(viii) Explain the term regression coefficient.

(ix) Given x = 2, 4, 6 and y = 4, 4, 4, find simple correlation coefficient.

(x) Write the relationship between regression coefficient and correlation coefficient.

(xi) What is curve fitting?

(xii) If $\Sigma(X - \bar{X})(Y - \bar{Y}) = 8400$ and $\Sigma(X - \bar{X})^2 = 2800$ , find $b_{yx} = $ ?

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

(i) Define the term Dichotomy for attributes.

(ii) What is positive and negative association?

(iii) What is contrary classes?

(iv) Define independence of attributes.

(v) What is contingency table?

(vi) If $\hat{y} = 10 + 3x$ , find the trend values for x = 1, 2, 3, 4?

(vii) Define principle of least square.

(viii) Write down two properties of least square line.

(ix) Enlist the different methods of measuring secular trend.

(Turn Over)

## SECTION – II    *LHR-12-18*

**Note :** **Attempt any THREE questions.**

5. (a) In a normal distribution $\mu = 47.6$ and $\sigma = 16.2$ , find :
   (i) $P_{90}$  (ii) Two points such that any value has 95% probability of falling between them.    4

   (b) If $X \sim N ( 60 , 100 )$, where X indicate marks obtained by student, find probability that a student selected at random obtains marks : (i) less than 56  (ii) more than 50    4

6. (a) Draw all possible samples of size 2 with replacement from a population 2, 4, 6

   make sampling distribution of sample mean. Also find (i) $\mu_{\bar{x}}$  (ii) $\sigma_{\bar{x}}$    4

   (b) If  $n_1 = 10$ , $n_2 = 15$

   $\mu_1 = 30$ , $\mu_2 = 10$

   $\sigma_1^2 = 5$ , $\sigma_2^2 = 6$

   find  (i) $\mu_{\bar{x}_1 - \bar{x}_2}$  (ii) $\sigma_{\bar{x}_1 - \bar{x}_2}$

   if sampling is done with replacement    4    4

7. (a) Given the following summary statistics :

| $n_1 = 40$ | $\bar{x}_1 = 90$ | $\sigma_1 = 15$ |
|---|---|---|
| $n_2 = 50$ | $\bar{x}_2 = 100$ | $\sigma_2 = 20$ |

   Construct 95% confidence interval for  $\mu_2 - \mu_1$

   (b) Test the null hypothesis $H_0 : \mu_1 = \mu_2$ against alternative hypothesis $H_1 : \mu_1 \neq \mu_2$ at $\alpha = 0.05$ using the data given in part (a).    4    4

8. (a) Fit the regression line of Y on X to given data and show that $\Sigma ( Y - \hat{Y} ) = 0$    4

| X | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Y | 1 | 1 | 2 | 2 | 4 |

   (b) Compute and interpret the co-efficient of correlation between the values of X and Y from the data given below :    4

| X | 5 | 10 | 15 | 20 | 25 |
|---|---|---|---|---|---|
| Y | 12 | 14 | 20 | 18 | 16 |

9. (a) Find co-efficient of association from the following data :    4

| Height of son | Height of father | |
|---|---|---|
| | Tall | Short |
| Tall | 500 | 100 |
| Short | 100 | 400 |

   (b) Compute the trend values by method of semi-average for the following data :    4

| Year | 1921 | 1922 | 1923 | 1924 | 1925 |
|---|---|---|---|---|---|
| Values | 15 | 18 | 17 | 42 | 38 |