Roll No _____ (To be filled in by the candidate)

(Academic Sessions 2018 – 2020 to 2020 – 2022)

STATISTICS 222-(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	The independent variable is also called : (A) Regressor (B) Predictor (C) Explanatory variable (D) All of these
2	A value calculated from the sample is called : (A) Parameter (B) Mean (C) Statistic (D) Proportion
3	If the attributes A and B are completely positively associated, then the co-efficient of association is equal to : (A) 1 (B) 0 (C) -1 (D) <1
4	The limits of the normal distribution are : (A) 0 to ∞ (B) $-\infty$ to $+\infty$ (C) $-\infty$ to 0 (D) 0 to 1
5	A decimal number system has base : (A) 10 (B) 8 (C) 2 (D) 16
6	Statistical inference is divided into --- approaches : (A) 2 (B) 3 (C) 4 (D) 5
7	A sample is a part of the : (A) Population (B) Sampling (C) Unit (D) Error
8	For a normal distribution with $\mu = 55$ and $\sigma = 10$, how much area will be found under the curve to the right of X = 55 : (A) 1.0 (B) 0.68 (C) 0.5 (D) 0.32
9	In the regression equation : $\hat{y} = a + bx$, the constant ' a ' is called : (A) X-intercept (B) Y-intercept (C) Dependent (D) Independent
10	Fire in a factory is an example of : (A) Secular trend (B) Irregular variations (C) Cyclical variations (D) Seasonal variations
11	A deserving player is not selected in the team, it is an example of : (A) Type-II error (B) Correct decision (C) Type-I error (D) None of these
12	If $\sigma^2 = 5$ and n = 2 , then $\sigma_{\bar{x}}^2$ is : (A) 2 (B) 2.5 (C) 3 (D) 5
13	A trend is the better fitted trend for which the sum of squares of residuals is : (A) Maximum (B) Zero (C) Minimum (D) None of these
14	Confidence co-efficient is denoted by : (A) $1-\beta$ (B) α (C) β (D) $1-\alpha$
15	In a normal distribution $N(\mu, \sigma^2)$, Q_1 is equal to : (A) $\mu + 0.6745\sigma$ (B) $\mu - 0.7979\sigma$ (C) $\mu - 0.75\sigma$ (D) $\mu - 0.6745\sigma$
16	The correlation co-efficient is independent of : (A) Origin only (B) Scale of measurement (C) Both origin and scale of measurement (D) None of these
17	A characteristic which varies in quality from one individual to another is called : (A) Attribute (B) Regression (C) Statistic (D) Variable

Roll No _____ (To be filled in by the candidate) **(Academic Sessions 2018 – 2020 to 2020 – 2022)**

STATISTICS 222-(INTER PART – II) Time Allowed : 2.40 hours

PAPER – II (Essay Type) Maximum Marks : 68

SECTION – I

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

(i) What is the range of normal distribution?

(ii) In a normal distribution if $\mu_2 = 16$, then find the value of μ_4.

(iii) If M.D. of a normal distribution is 16, find the value of σ.

(iv) Write down the importance of normal distribution.

(v) The mean of a normal distribution is 10, what will be the values of its median and mode?

(vi) What is meant by statistical inference?

(vii) Given $n = 40$, $\bar{X} = 32$, $\sigma = 7$ and $Z_{\frac{\alpha}{2}} = 1.96$, find C.I. for μ.

(viii) Define hypothesis.

(ix) Define type – I error with example.

(x) Given $n = 100$, $\bar{x} = 5.9$, $\mu = 6$ and $\sigma = 0.2$, find z.

(xi) What is data processing?

(xii) Define hybrid computer.

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

(i) Define target population.

(ii) Differentiate between sampling error and non-sampling error.

(iii) What do you mean by Bias?

(iv) Give any two advantages of sampling.

(v) Given $n = 36$, $\sigma_{\bar{x}} = 2$ then find σ^2.

(vi) If $\mu_1 = 10$, $\mu_2 = 8$; then find $\mu_{\bar{x}_1 - \bar{x}_2}$

(vii) What is meant by curve fitting?

(viii) Discuss principle of least squares.

(ix) If $\bar{x} = 50$, $\bar{y} = 110$, $a = 10$, then find b

(x) Give two properties of correlation coefficient.

(xi) What is perfect positive correlation?

(xii) If $S_x^2 = 9.102$; $S_y^2 = 2.204$; $S_{xy} = 1.694$ then find r (correlation coefficient)

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

(i) Define association of attributes.

(ii) If $(A) = 20$, $(B) = 10$, $n = 40$, find (AB) if 'A' and 'B' are independent.

(iii) Differentiate between class and class frequency.

(iv) Given $(AB) = 95$, $(A\beta) = 55$, $(\alpha B) = 85$, $(\alpha\beta) = 45$, find the co-efficient of association.

(v) Give the formulae of ' a ' and ' b ' while computing the trend by semi-average method.

(vi) Differentiate between signal and noise.

(vii) If $\hat{y} = 10 - 2x$, find the trend values for $x = 0, 1, 2, 3, 4, 6$

(viii) Name any three methods of obtaining secular trend.

(ix) Enlist the components of time series.

SECTION – II

Note : Attempt any THREE questions.

5. (a) Given that the heights of college boys normally distributed with mean $5'-2''$ and standard deviation $4''$ and that minimum height required for joining N.C.C. is $5'-4''$. Find percentage of boys who would be rejected on account of their height. 4

   (b) If $X \sim N(0, 4)$, find (i) $P[X > 0]$ (ii) $P[0.2 < X < 1.8]$ 4

6. (a) Given $\mu_{\bar{x}_1 - \bar{x}_2} = 4, \mu_2 = 6, \sigma_1 = 2.25, N_1 = 30, N_2 = 25, n_1 = 4, n_2 = 4, \sigma_{\bar{x}_1 - \bar{x}_2} = 6.25$.
   Find μ_1 and σ_2 when sampling is done without replacement. 4

   (b) A population consists of three numbers 4, 6, 8. Take all possible samples of size two with replacement from this population. Find mean and unbiased variance of each sample. Also find sampling distribution of variances. 4

7. (a) Find a 95% confidence interval for the mean of a population if a sample of 25 values gave a mean of 83. Here $\sigma = 7$. 4

   (b) A sample of size 100 is taken from a population whose variance is 25. If sample mean is 50. Test 4

   $H_0 : \mu = 60$

   $H_1 : \mu \neq 60$

   $at\ \alpha = 0.01$

8. (a) Fit the regression line taking Y as independent variable : 4

X	8	9	11	11	12	14	15
Y	20	40	50	70	75	80	82

   and show that $\Sigma(X - \hat{X}) = 0$

   (b) For a set of 8 pairs of observations $\Sigma X = 144$, $\Sigma Y = 160$, $S_x = S_y = 5$, 4
   $\Sigma(X - \bar{X})(Y - \bar{Y} = 180)$, find correlation coefficient.

9. (a) Calculate the value of Chi-square for the following data : 4

	Vaccinated	Not vaccinated
Attacked	27	77
Not attacked	88	74

   (b) Calculate 3 year moving averages and 2 year centred moving averages for the following data : 4

Year	1920	1921	1922	1923	1924
Y	80	74	73	83	72