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**PG CBCS**  
**M.A./M.SC. Semester-II Examination, 2021**  
**GEOGRAPHY**  
**PAPER: GEO 295**  
**PRACTICAL**  
**(STATISTICAL TECHNIQUES)**

**Full Marks: 50****Time: 3 Hours**

The figures in the right-hand margin indicate full marks.  
 Candidates are required to give their answers in their own words as practicable.  
 Illustrate the answers wherever necessary.

**Write the answer for each unit in separate sheet**

**GROUP/UNIT**

**(GEO 295.1: BASIC STATISTICS IN GEOGRAPHY)**

**Answer all questions from the following:**

1. For 100 pairs of observations on rainfall in inches (x) and yield of paddy per acre in quintals (y), the following calculations have been made:

8+1+3+3

$$\sum_{i=1}^{100} x_i = 2500, \quad \sum_{i=1}^{100} y_i = 4000, \quad \sum_{i=1}^{100} x_i^2 = 63400, \quad \sum_{i=1}^{100} y_i^2 = 163600, \quad \sum_{i=1}^{100} x_i y_i = 101170$$

- Fit a linear regression line of (y) on (x) and estimate the probable crop yield when rainfall is 20 inches.
- What will be the change in yield of paddy per acre for 1 inch increase in rainfall?
- Calculate the correlation coefficient between (x) and (y) and comment on the goodness of fit of the regression line.
- Calculate the Residual Sum of Squares (RSS).

**OR**

If two balls are drawn one after another from the containing 3 white and 5 black balls, what is the probability that (i) the first ball is white and the 2<sup>nd</sup> is black; (ii) one ball is white and the other is black?

Write the properties of a normal curve.

5+5+5

2. Draw a simple random sample (without replacement) of 10 households from a population of 300 households. Write down all the steps.

10

Use the following string of random numbers:

9092   4773   0002   7000   7800   2292   2933   6125   8118   4646   9668   3408   8878  
 3534   5549

**(P.T.O.)**

(2)

OR

Discuss the steps of conducting hypothesis testing.

10

**GROUP/UNIT****(GEO 295.2: ADVANCED QUANTITATIVE METHODS)****Answer all questions from the following:**

1. a) What is the basic difference between one-way and two-way ANOVA? Suppose the National Transportation Safety Board (NTSB) wants to examine the safety of compact cars, midsize cars, and full-size cars. It collects a sample of three for each of the treatments (cars types). Using the hypothetical data provided table below, test whether the mean pressure applied to the driver's head during a crash test is equal for each types of car. Use  $\alpha = 5\%$ .

Compact cars	Midsize cars	Full-size cars
643	469	484
655	427	456
702	525	402

- b) What does multicollinearity mean in statistics and how is it diagnosed?

2+8+2+1

OR

From the following table examine the effects of fertilizer and rainfall on the amount of grain harvested by using appropriate statistical technique and discuss the results.

12+3

Plot	Yield	Fertilizer	Rain
Plot 1	40	100	10
Plot 2	50	200	20
Plot 3	50	300	10
Plot 4	70	400	30
Plot 5	65	500	20
Plot 6	65	600	20
Plot 7	80	700	30

2. Write the steps of conducting one-way ANOVA test.

10

OR

Write down the steps involved in statistical model building techniques.

10

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