

**Time: 2 hours Max Marks: 50**

**This paper contains THREE printed pages and THREE parts**

**PART-A**

**Answer any SEVEN of the following 2m x 7 = 14 marks**

1. What are positional averages? Give an example.
2. What are absolute and relative measures of dispersion?
3. What is the difference between correlation and regression?
4. What are the assumptions of a Binomial distribution?
5. Why do we accept the null hypothesis if the calculated value is lesser than the table value in a χ2 distribution?
6. What are 2-tailed tests? Give an example of an alternate hypothesis for 2-tailed tests.
7. What are the components of a one-way ANOVA table? Which of them had additive properties?
8. What are the advantages of post-ANOVA tests over LSD? Which test is used for comparisons with control?
9. What are the advantages and disadvantages of RCBD in comparison to CRD?

**PART B**

**Answer any FOUR of the following: 5m x 4 = 20 marks**

1. Calculate the mean pulse rate from the following data.

| Pulse Rate | 60-64 | 65-69 | 70-74 | 75-79 | 80-84 | 85-89 | 90-94 | 95-99 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| f | 2 | 3 | 8 | 12 | 13 | 7 | 4 | 1 |

1. Calculate the Coefficient of variation from the following data and state which of them is more variable.

|  |  |  |  |  |  | Mean | SD |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Set J | 6 | 24 | 37 | 49 | 64 | 36 | 20 |
| Set K | 111 | 114 | 117 | 118 | 120 | 116 | 3.16 |

1. Number of tubers per plant in two varieties of potato are given below. Compare the results and state your inference. (tab=2.66)

|  | n | mean | variance |
| --- | --- | --- | --- |
| Variety 1 | 35 | 13.71 | 3.86 |
| Variety 2 | 35 | 19.63 | 6.12 |

1. Comment on the correlation between theory and practical marks among 10 students.

| Student | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Theory (x) | 59 | 63 | 64 | 70 | 74 | 78 | 79 | 82 | 86 | 92 |
| Practical (y) | 70 | 69 | 76 | 79 | 76 | 80 | 86 | 77 | 84 | 90 |

Σx=747 Σy=787 Σx2=56831 Σy2= 62335 Σxy=59347

1. Four different drugs have been developed for the cure of a certain disease. These drugs were tried on patients in three different hospitals. The number of cases of recovery per hundred were recorded.

State the null and alternate hypotheses. From the data given below, construct an ANOVA table and test your null hypothesis. (tab value= 4.8)

CF=4961.33, Σx2= 5470, Σ(drugs)2/no of hospitals =360, Σ(hospitals)2/no of drugs= 15.17

1. Dry seeds were irradiated with three different doses of gamma rays. Germination percent was recorded and was found significant. Which among the 3 doses would you prefer?

| Replicates | 10kR | 20kR | 30kR |
| --- | --- | --- | --- |
| 1 | 90 | 85 | 75 |
| 2 | 95 | 80 | 80 |
| 3 | 90 | 85 | 75 |
| 4 | 85 | 75 | 60 |
| 5 | 80 | 70 | 65 |

TrMSS= 361.67, EMSS= 47.50, q(0.05)= 3.773, q(0.01)= 5.046

**PART C**

**Answer any TWO of the following: 8m x 2 = 16 marks**

1. For the last 300 years, extensive records have been kept on volcanic activity in Japan. From historical records, the mean number of volcanic eruptions or major seismic instances is 2.4/year. (a) What is the probability that no eruptions occur in 2024? (b) What is the probability of at least two eruptions occur in 2024?
2. In *Mirabilis jalapa*, when plants with red flowers were crossed with plants with white flowers, the F1 bears pink flowers. On selfing the F1, 41 red, 84 pink and 43 white flowered plants were obtained. Do the results confirm incomplete dominance? (tab=1.386, 5.991)
3. The following data relates to production in kg of three varieties A, B and C of wheat sown in 12 plots in CRD design. Is there any significant difference in the production of the three varieties? (tab value =4.26)

| A | 14 | 16 | 18 |  |  |
| --- | --- | --- | --- | --- | --- |
| B | 14 | 13 | 15 | 22 |  |
| C | 18 | 16 | 19 | 19 | 12 |