**ST. JOSEPH’S COLLEGE (AUTONOMOUS), BANGALORE-27**

Register Number:

**Date: 26-04-2019**

**B.Sc. BIOTECHNOLOGY– VI SEMESTER**

**SEMESTER EXAMINATION, MARCH 2019**

**BT6215: Biostatistics and Plant Biotechnology**

**Time- 21/2 hrs Max Marks-70**

**This paper contains two printed pages and three parts**

1. **Answer any TEN of the following 10 X 2 = 20 marks**
2. What are the different methods of protoplast isolation?
3. What is the difference between reporter genes and selectable markers?
4. How are silicon carbide fibres used in plant transformation?
5. Write a note on *Cry* proteins.
6. What makes plants ideal hosts for Molecular Pharming?
7. Write any two differences between morphological and DNA markers.
8. Depict the following data using a suitable diagram/ graph.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Crops** | **Rice** | **Jowar** | **Bajra** | **Maize** | **Wheat** |
| **Area in ’000 hectares** | 3123 | 1572 | 334 | 296 | 11 |

1. What is the need for sampling?
2. What is the best measure of central tendency? Why?
3. What are the assumptions of Binomial distribution?
4. What is stratified sampling?
5. What are α and β errors?
6. **Answer any FIVE of the following 5 X 6 = 30 marks**
7. Briefly describe Molecular Pharming of Hirudin and Phytase.
8. Define Polymorphism. Using diagrams, explain RFLP.
9. In your understanding, what are the merits and demerits of *Bt* Cotton?
10. Data recorded on the number of mites per leaf are given. Calculate the mean.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Number of mites per leaf** | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| **Number of leaves** | 30 | 17 | 21 | 23 | 10 | 16 | 4 | 6 | 7 | 2 | 3 |

1. Maturity data recorded on an early maturing mutant variety of Castor (Aruna) is given below. Calculate the standard deviation.

Days to maturity= 140, 140, 141, 141, 142, 145, 146, 150, 150, 155

1. Alpha particles are emitted by a radioactive source at the rate of three per every minute on the average. The number of particles is distributed according to the Poisson distribution. Calculate the probability of getting exactly 5 emissions in one minute.
2. Data recorded on the number of pods per plant for 6 treatments is given. Compare the mean difference by LSD method (n=120)

|  |  |  |
| --- | --- | --- |
| **Treatments** | **No. of Pods/Plant** | **SE(x)** |
| Control | 44.10 | 2.12 |
| 10kR | 47.20 | 2.17 |
| 20kR | 55.00 | 2.31 |
| 0.1% EMS | 48.10 | 2.20 |
| 0.2% EMS | 49.20 | 2.22 |
| 0.1% HZ | 41.10 | 1.46 |
| 0.2% HZ | 46.40 | 1.96 |

1. **Answer the following 2 X 10 = 20 marks**
2. Using appropriate diagrams, explain *Agrobacterium* mediated plant transformation.

**OR**

Using any two examples, describe any two strategies to engineer herbicide tolerance in plants.

1. The following data was recorded on the number of fertile branches per plant and the number of pods per plant in one of the varieties of lentil. Calculate the correlation coefficient and test its significance.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No. of fertile branches | 8 | 10 | 15 | 11 | 12 | 9 | 13 | 14 | 10 | 9 |
| No. of pods | 45 | 55 | 70 | 80 | 65 | 70 | 90 | 90 | 76 | 67 |

**OR**

A certain drug was administered to 450 persons out of a total of 800 persons in a certain locality to test its efficacy against typhoid. The results are given below in the table. Find out the effectiveness of the drug against the disease.

|  |  |  |
| --- | --- | --- |
|  | Infection | No Infection |
| Drug | 200 | 300 |
| No drug | 250 | 50 |