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

**END SEMESTER EXAM: APRIL 2018**

**B.Sc BIOTECHNOLOGY- VI SEM**

**BT 6215: BIOSTATISTICS AND PLANT BIOTECHNOLOGY**

**Time: 2.5 Hrs Max Marks: 70**

**Note**-The question paper has **TWO** sections. Each section has three parts and the paper has two printed pages. Answer section A and B in separate answer booklets.

**Section A -38 Marks**

1. **Answer any FIVE of the following 5x2=10marks**
2. Justify ‘Mode’ as the best representative of data.
3. What is Stratified sampling?
4. Calculate the Range and its Coefficient from the following data

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Age | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 | 80-90 |
| No.  | 3 | 61 | 132 | 153 | 140 | 51 | 2 |

1. When do we use the F-test? What is the test statistic?
2. What is Regression?
3. What are the assumptions of a Binomial distribution?
4. **Answer any THREE of the following 3x6=18marks**
5. Calculate the median from the following data recorded on a variety of rice

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Number of spikes per panicle | 50-60 | 60-70 | 70-80 | 80-90 | 90-100 | 110-120 | 120-130 | 130-140 | 140-150 |
| Number of branches | 5 | 13 | 17 | 25 | 29 | 22 | 17 | 12 | 5 |

1. Calculate the standard deviation and the coefficient of variation from the following data recorded on number of clusters in a variety of black gram

No. of clusters= 8,10, 10, 10, 12, 13, 15, 15,17, 20

1. A firm manufactured articles of which 1% are defective. These articles are packed in boxes each containing 5. Find out the probability of boxes which are free from defective articles.
2. Data obtained on two sets of results with regards to number of flowers per plant. Analyze the data using t-test and give your inference on the mean difference on number of flowers.

|  |  |  |
| --- | --- | --- |
|  | **Set 1** | **Set 2** |
| **n** | 30 | 32 |
| **Mean** | 15.65 | 10.15 |
| **Variance** | 6.20 | 7.80 |

 BT-6215-B-18

1. **Answer any ONEthe following 1x10=10marks**

11 a. Data recorded on the length of panicle and the number of grains per panicle in a variety of rice. Calculate the correlation coefficient and find out its level of significance.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Length (cms)** | 10.5 | 12.0 | 15.5 | 12.5 | 15.0 | 11.0 | 16.0 | 14.0 | 16.5 | 13.5 |
| **No. of grains** | 75 | 80 | 85 | 108 | 110 | 85 | 105 | 110 | 112 | 107 |

**OR**

b. in a grassland, association of two species, *Heteropogoncontortus* and *Aristidasetacea* was investigated in 240 quadrats. The presence and the absence data for the species are given below in the table. Calculate the nature of association. (Expected values are shown in parantheses).

|  |  |
| --- | --- |
|  | **Species A: *Aristidasetacea*** |
| **Present** | **Absent** | **Total** |
| **SpeciesB :*Heteropogoncontortus*** | **Present** | 65 (63.75) | 25 (26.25) | 90 |
| **Absent** | 105 (106.25) | 45 (43.75) | 150 |
| **Total** | 170 | 70 | 240 |

**SECTION B- 32 Marks**

1. **Answer any FIVE of the following questions 5 X 2 = 10 marks**

1. Define polymorphism.

2. Write a brief note on Lepirudin.

3. Compare genomic DNA and cDNA libraries.

4. What are the steps involved in somatic hybridization?

5. Write a brief note on ‘Roundup ready’ crops.

6. What is ‘disarming’ in the context of plant transformation?

1. **Answer any TWO of the following questions 2 X 6 =12 marks**

7. Describe the various promoters used in plant transformation.

8. Write a note on how phytohormones work.

9. Discuss the approaches to improve abiotic stress tolerance in crop plants.

1. **Answer any ONE of the following questions 1 X 10 = 10 marks**

10.Compare the various host systems available for Biopharming, with special mention of the advantages and disadvantages of each system.

**OR**

11.Using appropriate illustrations, describe how *Agrobacterium* mediated transformation occurs in nature and how this can be used to generate transgenic crops.