**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. Which measure of central tendency is considered the best? Why?
3. What is the need for sampling?
4. Calculate the Range and its Coefficient from the following data

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Age | 25-30 | 30-35 | 35-40 | 40-45 | 45-50 | 50-55 | 55-60 |
| No.  | 3 | 61 | 132 | 153 | 140 | 51 | 2 |

1. What is Standard Error?
2. Differentiate between absolute and relative measures of dispersion
3. What are the assumptions of a Binomial distribution?
4. **Answer any THREE of the following 3x6=18marks**
5. Calculate the median graphically from the following data

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No. of branches | 0-3 | 3-6 | 6-9 | 9-12 | 12-15 |
| No. of plants | 4 | 8 | 22 | 10 | 4 |

1. Calculate the variance from the following data recorded on number of tillers per plant in a variety of sorghum

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Number of tillers/ plant | 1 | 2 | 3 | 4 | 5 | 6 | 8 |
| Number of plants | 4 | 8 | 9 | 10 | 11 | 12 | 15 |

1. A book contains 100 misprints distributed randomly throughout its 100 pages. What is the probability that a page observed at random contains at least 2 misprints?
2. Calculate the correlation coefficient from the following data:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Height of Father (inches) | 65 | 66 | 67 | 68 | 67 | 69 | 70 | 64 | 65 | 63 |
| Height of Son (inches) | 68 | 65 | 68 | 70 | 67 | 68 | 72 | 66 | 68 | 62 |

1. **Answer any ONE of the following questions 1x10=10marks**

11 a. The grain yield per plant of wheat is given below. Calculate the coefficient of skewness from the following data:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Yield (g) | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 |
| No. of plants | 6 | 12 | 22 | 48 | 56 | 32 | 18 | 6 |

**OR**

b. In a sample of 100 persons, the observed and expected proportions of blood groups were as follows. Calculate the *χ2* value and interpret your results.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | A | B | AB | O |
| *fo* | 42 | 9 | 3 | 46 |
| *fe* | 23 | 35 | 5 | 37 |

**SECTION B- 32 Marks**

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

1. What are reporter genes? Give two examples.

2. What are the advantages of somatic hybridization?

3. Comment on the ‘bar’ gene.

4. Differentiate between Cybrid and Synkaryocyte.

5. What are the ‘green revolution genes’?

6. Name the triple response hormone. Why is it called so?

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

7. Compare and contrast Particle bombardment and *Agrobacterium* mediated transformation techniques.

8. Using illustrations, describe a Restriction enzyme based molecular marker.

9. Describe how Glyphosate tolerance has been engineered in crop plants.

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

10. With examples, discuss the major groups of recombinant proteins commercially produced in plants by Molecular Pharming.

**OR**

11. Describe the Bt cotton crop cultivated in India, with emphasis on the gene constructs, mode of action and its effect on cotton productivity in India. Using relevant statistics, discuss the challenges associated with cultivation of Bt Cotton.