April 2025
B.A./B.Sc.
Sixth Semester
DISCIPLINE SPECIFIC ELECTIVE – 4
BOTANY
Course Code: BOD 6.21
(Biostatistics)

Total Mark: 70 *Pass Mark: 28*
Time: 3 hours

Answer five *questions, taking* one *from each unit.*

UNIT–I

1. Describe the basic principles of statistics. Mention any three uses and limitations of statistics. 8+3+3=14

2. What is the importance of variables in statistics? Incorporate examples from daily life and explain quantitative and qualitative variables. 2+6+6=14

UNIT–II

3. If a researcher wants to collect primary data on a particular research topic, describe the various methods which the researcher can use for data collection. 14

4. By taking an example, illustrate how the same data can be presented in various ways. Add a note on the benefits of tabulation of data. 12+2=14

UNIT–III

5. Calculate the five number summary of the following data: 6, 8, 6, 7, 7, 6, 5, 5, 6, 4, 6, 5. Draw a box and whisker plot to express the data graphically. Why is it important to measure dispersion of data? 6+3+5=14

6. Calculate the median of the data given in the table below. Construct a graph to show the shape of distribution of the data. Write the merits and demerits of median as a central tendency measure. 8+4+2=14

Class interval	0-5	6-10	11-15	16-20	21-25	26-30
Frequency	2	6	5	4	2	1

UNIT–IV

7. A jar contains 6 red, 4 green, 2 blue, and 8 yellow marbles. If a single marble is drawn at random from the jar, what is the probability of drawing a red or a blue marble? Explain the difference between exclusive and a non-mutually exclusive event. Illustrate your points with suitable examples. 6+6+2=14

8. Explain the concept and the use of multiplication rule and compare it with addition rule. If a fair dice is rolled four times, what is the probability of rolling a six all the four times? Which formula will you use and why? 6+6+2=14

UNIT–V

9. The table shows result of a dihybrid cross. Determine if the observed value fits the expected Mendelian ratio of 9:3:3:1. Propose a null and alternative hypothesis. Determine the degrees of freedom. Give an interpretation of the outcome. (Given: $\alpha = 0.05$, critical value = 7.81) 7+2+1+4=14

Phenotype	Theoretical Proportion	Observed Counts
Round yellow	9/16	315
Round green	3/16	101
Wrinkled yellow	3/16	108
Wrinkled green	1/16	32

10. Consider that the current average rice yield of Nagaland is 2 Mg/ha. If a new rice variety was tested in 30 locations and found to have an average yield of 2.5 Mg/ha. Calculate if the yield of the new rice variety is different from the current average yield. Propose a null and alternative hypothesis. Show the degrees of freedom. Give interpretation of the test statistics. (Given: SD = 0.77, $\alpha = 0.05$, $t_{crit} = 2.045$) 7+2+1+4=14
