B.Sc. 5th Semester (Honours) Examination, 2022 (CBCS)

Subject : Botany

Course : DSE-2

(Biostatistics)

Time : 2 Hours **Full Marks : 40**

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

1. Answer *any five* from the following: 2×5=10

(a) What is biostatistics?

(b) Calculate the median value from the following data on height (cm) of 9 plants

57, 55, 60, 58, 52, 53, 54, 53, 56

(c) If the correlation is completely perfect and positive what should be the value of '*r*'?

(d) State the significance of 'F' test?

(e) Expand the acronym ANOVA. Mention its significance.

(f) What is meant by Regression?

(g) Define Standard Error.

(h) What is meant by Mode?

2. Answer *any two* from the following: 5×2=10

(a) Mention the different methods of sampling. Differentiate between primary data and secondary data. 2+3=5

(b) Make a concise account on 'Quartile deviation'. 5

(c) What do you understand by arithmetic mean? Calculate the arithmetic mean from the following data given in the table: 1+4=5

Age (in years)	20-24	25-29	30-34	35-39	40-44	45-49	50-54
No. of individuals	12	25	31	42	36	24	30

(d) What is correlation? Mention steps to calculate the correlation co-efficient. 1+4=5

3. Answer *any two* from the following: 10×2=20

(a) What do you understand by standard deviation? Compute the mean, variance, standard deviation and coefficient of variation from the following data on grain yield per plant (in gm) of ten plants of a rice variety—Grain yield/plant—19·1, 20·2, 21·1, 22·4, 23·8, 23·9, 24·7, 25·5, 26·2, 27·2. 2+8=10

Please Turn Over

(b) Write short notes on:

(i) Pie diagram and

(ii) Histogram.

(c) Write the importance of Chi-square (χ^2) test. A variety of pea with yellow seed coat when crossed with another variety with green seed coat, produces 154 plants with yellow seed coat and 45 plants with green seed coat in F_2. Using suitable statistical technique, test the goodness of fit and comment on your results. (χ^2 = 3·841 at 5% level of significance of 1 degree of freedom). 3+7=10

(d) What is t-test? Seed yield (gm) of two plant types (Control-A and Mutant-B) of *Nigella sativa* has been given—

Sample-A :	1·8	1·9	2·0	2·1	2·2	2·3	2·4	2·5	2·6	2·6
Sample-B :	2·3	2·4	2·5	2·5	2·7	2·8	2·9	3·0	3·1	3·2

Test whether mean yield of two plant types of *Nigella sativa* is significant or not.

(Table value of 0·05 probability level at 18 degree of Freedom is 2·10) 2+8=10

B.Sc. 5th Semester (Honours) Examination, 2022 (CBCS)

Subject : Botany

Course : DSE-2 (Bioinformatics)

Time : 2 Hours **Full Marks : 40**

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as applicable.

1. Answer *any five* questions: 2×5=10

(a) Define the term 'bioinformatics'.

(b) What is 'Biological Database'?

(c) What is Gen Bank?

(d) Mention the significance of multiple sequence alignment (MSA).

(e) What are the two significant usages of Molecular Phylogeny?

(f) Mention two main differences between BLOSUM and PAM.

(g) What are ADMET properties?

(h) Define QSAR.

2. Answer *any two* questions from the following: 5×2=10

(a) What is BLAST? Describe the different types of BLAST programs used in bioinformatic studies. 1+4=5

(b) What is 'Biological Database Retrieval System'? Briefly describe its significance. 2+3=5

(c) Mention two differences between cladistic and phenetic methods to study phylogenetic relationships. Compare maximum parsimony (MP) and neighbour joining (NJ) tree for phylogeny construction. 2+3=5

(d) What is protein modelling? Mention two methods of protein modelling. 2+3=5

3. Answer *any two* of the following questions: 10×2=20

(a) What are the main branches of bioinformatics? Briefly discuss about the significance and application of bioinformatics in plants. 5+5=10

(b) Define a 'molecular phylogenetic tree'. What are the differences between a 'rooted' and 'unrooted' phylogenetic tree? Briefly describe different types of phylogenetic tree. 1+3+6=10

(c) Explain the role of bioinformatics in microbial genomic studies. 10

(d) Briefly describe the salient features and different resources of EMBL and PIR. 5+5=10

B.Sc. 5th Semester (Honours) Examination, 2022 (CBCS)

Subject : Botany

Course : DSE-2 (Natural Resource Management)

Time : 2 Hours **Full Marks : 40**

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as applicable.

1. Answer *any five* from the following: 2×5=10

(a) Write two importances of sustainable utilization of natural resources.

(b) Distinguish between renewable and non-renewable energy sources.

(c) What do you understand by bio-prospecting?

(d) Define aquifer.

(e) Give the full form of GIS. Mention one utility of GIS in Natural Resource Management.

(f) What is IPR?

(g) What is the ecological significance of watershed?

2. Answer *any two* of the following: 5×2=10

(a) What are wetlands? Mention its importance. Name two wetlands of India identified as Ramsar Sites. 1+3+1=5

(b) What are the major and minor forest products? What do you understand by participatory forest management? 3+2=5

(c) What are the main causes of loss of biodiversity? Distinguish between α and β diversity. 3+2=5

(d) Write short notes on the following:

(i) Social forestry

(ii) Rain water harvesting

3. Answer *any two* of the following questions: 10×2=20

(a) What is EIA? Explain in brief the various steps and processes of EIA. 2+8=10

(b) Discuss the main causes of soil degradation. How can we control soil degradation. 5+5=10

(c) Distinguish between *in-situ* and *ex-situ* conservation of biodiversity. Explain the advantages and disadvantages of each approaches. Mention the role of biosphere reserve and botanic garden in biodiversity conservation. 2+4+4=10

(d) What is ecological footprint? How can we reduce ecological footprint? How is a carbon footprint different from ecological footprint? 3+4+3=10