Total number of printed pages = 7

2022

(Held in 2023)

BOTANY

(Theory Paper)

Paper Code : BOT-304

(Bio-Statistics and Bio-Informatics)

Full Marks – 80

Pass Marks – 32

Time – Three hours

The figures in the margin indicate full marks for the questions.

PART – I

(Bio-Statistics)

1. Choose the correct options among the following :

    1×5=5

    (a) You are asked to estimate number of oranges from an orange orchard. What will be your sampling unit for the survey ?

    (i) A quadrat

    (ii) Each branch of the tree

    (iii) Each tree

    (iv) All of the above

(b) Following are the lengths of five leaves of *Terminalia arjuna* : 15.7cm, 12.5cm, 11.7cm, 14.0cm 13.1cm. Find the Median.

(i) 15.2 cm   (ii) 11.7 cm

(iii) 13.1 cm   (iv) 13.0 cm

(c) Following are the measurements of GBH of five individuals of *Shorea robusta* : 23.5cm, 20.7cm, 18.2cm, 30.1cm 25.6cm. Find the Range.

(i) 12.3 cm   (ii) 11.9 cm

(iii) 13.2 cm   (iv) 15.5 cm

(d) Following are the number of leaflets of Tamarind leaves : 24, 25, 26, 24, 24, 22, 24, 28, 26. Find the Mode.

(i) 23   (ii) 24

(iii) 25   (iv) 26

(e) A research has found Pearson's Coefficient of Correlation between height and GBH of a tree species as 0.95. Which of the following inferences are correct ?

(i) There is perfect positive correlation between height and GBH.

(ii) There is moderate positive correlation between height and GBH.

(iii) There is strong positive correlation between height and GBH.

(iv) There is negative positive correlation between height and GBH.

2. Answer in brief any *three* of the following questions :   5×3=15

(i) In an experiment, three chili plants had been planted with different treatments. The following yields as number of fruits were recorded : control (25), cow dung manure (75) and chemical fertilizer (50). Find if there was significant yield of chili among the three treatments.   5

(ii) Differentiate between Parametric and Non-parametric test.   5

(iii) Differentiate between Standard deviation and Standard error with suitable illustrations and formulae.   5

(iv) Write short notes on 'Kurtosis' and 'Skewness' with suitable diagrams.   5

3. Answer the following questions : 2×10=20

(a) What is Normal Distribution Curve ? Explain its properties with suitable diagrams.

2+8=10

(b) The following are the lengths and widths of *Colocasia esculenta*. Test if there exists any significant relationship between these two variables :

10

Length (cm) :	13.7	18.7	15.8	13.8	14.7
Width (cm) :	7.2	10.2	5.4	7.0	7.3
Length (cm) :	17.6	14.4	15.4	19.3	18.3.
Width (cm) :	9.1	8.1	8.6	5.1	10.7

PART – II

(Bio-Informatics)

1. Choose the correct options among the following (*All* compulsory) : 1×5=5

(a) SWISS-PROT protein sequence database began in the year of

(i) 1988 (ii) 1985

(iii) 1986 (iv) 1987

(b) In Computer science and Information technology (IT), DNS is an abbreviation of

(i) Direct Name System

(ii) Domain Name System

(iii) Direct Name Software

(iv) Domain Name Software

(c) A computer program that translates one statement of program instructions at a time into machine language is called

(i) CPU (ii) Interpreter

(iii) Compiler (iv) Simulator

(d) Submission of Gene Bank are made using

(i) Banklt and Sequin

(ii) Banklt and Bankln

(iii) Sequin and Bankln

(iv) Entrez

(e) The identification of drug through genomic study is called

(i) Genomics

(ii) Cheminformatics

(iii) Pharmacogenetics

(iv) Pharmagenomics.

2. Answer the following short questions : (*All* are compulsory) 2×4=8

(a) What is Data mining ?

(b) Write the name of any two protein database.

(c) What is e-value of alignment scores ?

(d) What is "BLAST" ?

3. Answer any *three* of the following questions : 5×3=15

(a) Differentiate between Windows and Linux-operating system.

(b) Discuss any one algorithm for sequence alignment.

(c) How ribosome could be used as drug target ? Give examples of drugs acting on ribosome.

(d) Discuss the role of biological database in understanding the life and solving the biological questions with special reference to nucleotide sequence databases.

(e) Write the scope and application of bioinformatics.

4. Answer *two* of the following questions : 6×2=12

(a) What is neighbor-joining methods ? How it is useful in constructing phylogenetic tree ? 3+3=6

(b) Illustrate global alignment with suitable example. 6

(c) Explain the various steps of molecular docking. 6