2021

BOTANY — HONOURS

Paper : DSE-A-1

(Biostatistics)

Full Marks : 50

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*** questions :

(a) State two limitations of biometry. 2

(b) Distinguish between primary and secondary data. 2

(c) What is alternative hypothesis? 2

(d) Define 'goodness of fit'. 2

(e) Compare variable and variate. 2

(f) What is central tendency? Write about one measure of central tendency. 1+1

(g) Compare simple random sampling and non-random sampling. 2

(h) What will be the value of 'probability of not happening' when the value of 'probability of happening' is 0·8? 2

2. Answer ***any two*** of the following :

(a) Distinguish between (*any two*) : 2½×2

(i) Continuous variable and Discontinuous variable.

(ii) Population parameter and Sample statistic.

(iii) Genotype frequency and Allele frequency.

(b) Define mean, median and mode. Explain which one is more acceptable in statistics. 3+2

(c) Briefly mention the factors affecting gene frequency. 5

3. Answer ***any three*** of the following :

(a) What is standard deviation? Mention its merits and demerits. The plant height of a rice cultivar is as follows :

Plant height (cm)	80 – 85	86 – 90	91 – 95	96 – 100
No. of plants	3	5	8	4

Calculate the mean and standard error of the height of cultivar. 3+2+5

(b) What is dispersion? State the properties of a normal distribution curve. The leaflet length of *Cassia sophera* is as follows :

Leaflet length (cm)	5.1 – 6.0	6.1 – 7.0	7.1 – 8.0	8.1 – 9.0	9.1 – 10.0
No. of leaflets	2	12	25	13	3

Calculate the coefficient of variation and comment on it. 2+3+5

(c) Selfing of a hybrid produced a population with 59 coloured and 5 colourless seeds. The chi-square table value is 3.84 for 1 degree of freedom at 0.05 probability level. Find out the segregation ratio and test the goodness of fit using the chi-square analysis. Comment on the nature of segregation. 3+4+3

(d) State the Hardy-Weinberg equation. Explain its utility in measuring gene frequency. MN blood types were tested in 100 people. The genotypic data was MM = 66, MN = 20 and NN = 14. Prove that the population is in Hardy-Weinberg equilibrium. 2+3+5

(e) Explain the addition and multiplication rules of probability. What is the probability of getting a king or a joker from a pack of 52 cards (with 4 kings and 2 jokers)? What is the combined probability of getting a king in 4 consecutive drawals from this pack of cards without replacing cards after each drawal? 5+2+3