

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*) : $2\frac{1}{2} \times 2$
- (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

Please Turn Over

- (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 draws from this pack of cards without replacing cards after each draw?
- 5+2+3
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