WEST BENGAL STATE UNIVERSITY
B.Sc. Honours 6th Semester Examination, 2023

BOTADSE06T-BOTANY (DSE3/4)

Time Allotted: 2 Hours   Full Marks: 40

The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.
All symbols are of usual significance.

1.   Answer the following questions briefly: 1×16 =16
   (a) State the different types of data collection procedure.
   (b) The mean of 6 observations is 17.5. If five of them are 14, 9, 23, 25 and 10, find the sixth observation.
   (c) Give the formula for χ^2 statistic.
   (d) State the merits of mode.
   (e) Write down the two properties of line of regression.
   (f) Explain graphically the line of best fit.
   (g) Find the coefficient of correlation between X and Y, when $\text{cov}(X, Y) = 2.75$, $\text{var}(X) = 6.25$ and $\text{var}(Y) = 20.25$.
   (h) Find the mean of the positive factors of 24.
   (i) The mean of 10 (ten) numbers is 55. If one number is included, then mean becomes 60. Find the included number.
   (j) If m is the mid point and l is the upper limit of a class in a continuous frequency distribution, then what is the lower limit of the class?
   (k) If the mean of the five observations, $m+1$, $m+3$, $m+5$, $2m+2$, $3m+3$ is 14, find the mean of the first three observations.
   (l) Calculate the range and coefficient of range of the following data:
   60, 70, 80, 100, 120, 140, 160, 170, 180, 200
   (m) Write the formula of calculations of correlation of coefficient when p and q are the two variables.
   (n) Mention different measures of testing of hypothesis.
   (o) What is contingency table?
   (p) If the median of 5 items is 3 and the median of another 5 items is 7, can you find the median of all the 10 items taken together?

2.   Answer any *eight* questions from the following: 3×8 = 24
   (a) Find the values of f_1 and f_2 from the following distribution, given the median is 28, and the total number of observations is 50.

A	0-10	10-20	20-30	30-40	40-50
B	5	f_1	15	f_2	6

(b) Calculate the mean, standard deviation and standard error of the height of the plants as given below (measured in cm)

139, 122, 120, 122, 126, 129, 134, 131, 132, 139

(c) The sum and the sum of squares corresponding to length X in cm and weight Y in g of 50 plants are given below:

$$\Sigma X = 212, \ \Sigma X^2 = 902.8, \ \Sigma Y = 261, \ \Sigma Y^2 = 1457.6$$

Which is more varying, the length or weight?

(d) If for a distribution $\sum(X-5) = 3$, $\sum(X-5)^2 = 43$ and the total number of items is 18, find the standard deviation.

(e) Critically compare between correlation and regression.

(f) What do you mean by standard deviation? Mention the merits and demerits of standard deviation.   1+2

(g) There are 9 boys and 9 girls in a class. Their heights are given below: 3

Boys	170	175	165	162	168	170	172	163	162
Girls	152	165	155	161	168	160	155	154	152

Calculate the variance of height separately for the boys and girls.

(h) Find the line of best fit to the following data using:

X	1	3	4	6	8	9	11	14
Y	1	2	4	4	5	7	8	9

(i) Show that if five students get respectively 1, 2, 3, 4, 5 marks (x) out of 10 in subject A and 3, 3, 5, 7, 6 marks (y) out of 10 in subject B, the regression equation of y on x can be written as $y = 1.8 + x$.

(j) Define quartile deviation. Find out the interquartile range and quartile deviation   1+2
from the following:

No. of Students	28	40	52	100	80	48	32	20	07
Height (cm)	150	152	154	156	158	160	162	164	166

(k) Four of the self-fertilized F_1 plants that Mendel observed for segregating of yellow and green seeds colour showed the following results among their seeds.

Plants	1	2	3	4
Yellow seeds	25	32	14	70
Green seeds	11	7	5	27

Test the homogeneity of the four plants for the 3:1 ratio and calculate the Chi-square value.

(l) An IQ Test was administered to 5 (five) persons before and after they are trained. The results are given below:

Candidates	I	II	III	IV	V
IQ before training	110	120	123	132	125
IQ after training	120	118	125	136	121

Test whether there is any change in IQ after training programme [$t_{0.05} = 2.306$ for df 8].

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