(b) Define standard deviation? Discuss its importance with example. Write down merits and demerits.

(9)

[This question paper contains 8 printed pages.]

Your Roll No.....

05.01.2024(IV)

Sr. No. of Question Paper : 4542 **G**

Unique Paper Code : 32167502

Name of the Paper : Biostatistics

Name of the Course : **B.Sc. (Hons) Botany – DSE**

Semester : V

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **five** Questions in all.
3. Question **1** is compulsory.
4. Non-scientific calculators allowed. Statistical tables provided by the college may be used if required.

1. (a) Define **(Any Five)** (1×5=5)

(i) Level of Significance

(ii) Type I error

(iii) Class interval

(iv) Coefficient of variation

(v) Percentile

(vi) Mode

(b) Fill in the blanks **(Any Five)** (1×5=5)

(i) In a regression equation $y = a + bx$ wherein 'b' represents _____ of the line.

(ii) _____ is the graph of cumulative frequency distribution.

(iii) For a random sample of 9 women, the average resting pulse rate is $x = 76$ beats per minute, and the sample standard deviation (s) is 5.0. The standard error of the sample mean is _____ .

5. (a) What do you understand by data? Explain different scales of statistical measurement of data. (6)

(b) What do you mean by sampling? Discuss the different sampling methods used in biostatistics with examples. (9)

6. (a) Number of books purchased by a college library relies on the number of students registered in a year as mentioned in the table below.

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Students (X)	36	28	35	39	30	30	31	38	36	38	29	26
Books (Y)	31	29	34	35	29	30	30	38	34	33	29	26

(i) Find out the linear regression equation of the given data-set.

(ii) Based on above data, predict number of books to be purchased for 15 students in the year 2022. (6)

P.T.O.

Students	1	2	3	4	5	6	7	8	9	10
Test 1	21	20	19	18	19	20	18	15	23	17
Test 2	22	21	20	21	22	23	20	18	23	20

(b) Following data-set shows Relative humidity (RH) and rate of transpiration of a mesophytic plant species. Explain the relationship using Karl Pearson Correlation and scatter plot: (6)

RH (%)	5	10	15	25	30	65	80	90
Transpiration rate (ml/h)	50	35	28	20	12	9	5	1

(c) Calculate the 3rd Quartile of the following data-set of marks obtained by students in an entrance examination. (3)

Roll no.	1	2	3	4	5	6	7	8	9	10
Marks (out of 100)	80	98	82	76	45	88	50	70	90	95

(iv) Number of observations falling within a particular class interval is known as _____ .

(v) The value of correlation coefficient always lies between _____ .

(vi) The nth root of the products of 'n' items is known as _____ .

(c) Mark True/False (1×5=5)

(i) If the value of two variables moves downward in same direction, then the correlation is negative.

(ii) Generally, in biological sciences the null hypothesis can be rejected if percentage a value is less than 0.05 percent.

(iii) Measures of Central Tendency for a given set of observations provides scatteredness of observations.

(iv) The symbol 'p' represents Spearman Correlation Coefficient.

P.T.O.

(v) Chi-square test was first developed by Karl Pearson.

2. Differentiate between : (3×5=15)

(a) t-test and F test.

(b) Pie Chart and Histogram.

(c) Correlation and Regression.

(d) Measures of Central tendencies and Dispersion.

(e) Mean Deviation and Quartile Deviation.

3. (a) The following table shows number of plants having certain characteristics :

	Flat Leaves	Curled Leaves
White flower	99	36
Red flower	20	5

Using chi-square test examine the hypothesis that the flower colour is independent of flatness of leaf. (5)

(b) A Bag contains 5 red, 3 black and 4 white balls. What is the probability of getting a red or a white ball at random in a single draw? (4)

(c) Draw a (i) Pie diagram and (ii) Bar Diagram on the following data set :

Crops	Area (in thousand acres)
Rice	16
Wheat	25
Jowar	12
Maize	10
Bajra	09
Maize	28

(6)

4. (a) Ten students of a class were given a biostatistics test. After seven-days special training they reappeared for a second test. Marks obtained in two tests are provided below. Apply an appropriate hypothesis test and find out whether special training has been significantly benefitted the students or not? (6)