

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2022
(Fourth Semester)

Branch – BIOTECHNOLOGY

BIostatistics

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks (10 x 1 = 10)

1. The measure of central value which cannot be calculated with open end class in case of grouped data is:
(i) Median (ii) Mode (iii) Mean (iv) Third quartile
2. Which measure of dispersion ensures highest degree of reliability?
(i) Range (ii) Quartile deviation
(iii) Mean deviation (iv) Standard deviation
3. Any measure of the population is called:
(i) Finite (ii) Parameter (iii) Infinite (iv) Purposive Sampling
4. Cluster sampling, stratified sampling and systematic sampling are types of
(i) Random sampling (ii) Direct sampling
(iii) Indirect sampling (iv) Non – random sampling
5. A measure of the strength of the linear relationship that exists between two variables is called
(i) Slope (ii) Intercept
(iii) Correlation coefficient (iv) Regression equation
6. Level of significance is the probability of
(i) Type I error (ii) Type II error
(iii) Not committing error (iv) Any one of the above
7. Paired t – test is applicable when the observations in the two samples are
(i) Paired (ii) Correlated
(iii) Equal in number (iv) All the above
8. The ratio between sample variance and within sample variance follows:
(i) t - distribution (ii) F - distribution
(iii) Z – distribution (iv) Chi square distribution
9. Local control in the field is maintained through:
(i) Uniformity trials (ii) Randomization
(iii) Natural factors (iv) All the above
10. A Latin square design is a:
(i) One restrictional design (ii) Two restrictional design
(iii) Three restrictional design (iv) Non – restrictional design

SECTION - B (35 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks (5 x 7 = 35)

- 11 a). Consider the weights gained by 100 fishes of a lab test, evaluate the median.

Weights gm)	20	30	40	50	60	70
No. of fishes	18	20	22	20	11	9

(Or)

Cont...

- b). In two laboratories X and Y engaged in the same research institution, the average monthly food consumption (in kg) on white leghorn and standard deviations is given in the following table.

Laboratory	Average consumption (in kg)	No. of white leghorn
X	24.5	450
Y	32.5	525

Which company has more variation in consumption of food?

- 12 a). Distinguish between complete enumeration and sample survey.

(Or)

- b). Describe random sampling and its types.

- 13 a). In trying to evaluate the effectiveness of antibiotics in killing bacteria, a research institution compiled the following information. Calculate the correlation coefficient.

Antibiotics (in mg) X	12	15	14	16	17	10
Bacteria (Lakhs) Y	5	7	5.6	7.2	8.6	6.2

(Or)

- b). Explain type I and type II errors.

- 14 a). The following results are obtained from a sample of 10 boxes of biscuits:

Mean weight of contents = 490 gms

Standard deviation of the weight = 9 gms.

Could the sample come from a population having a mean of 500 gms.

(Or)

- b). A certain drug was administered to 456 males, out of a total 720, in a certain locality to test its efficacy against typhoid. The incidence of typhoid is shown below. Find out the effectiveness of the drug against the disease.

	Infection	No Infection	Total
Administering the drug	144	312	456
Without administering the drug	192	72	264
Total	336	384	720

- 15 a). Describe the following terms (i) Randomization and (ii) Local control.

(Or)

- b). Discuss the advantages and disadvantages of Randomized Block Design.

SECTION - C (30 Marks)

Answer any **THREE** Questions

ALL Questions Carry **EQUAL** Marks

(3 x 10 = 30)

- 16 The life in days of 100 rats is distributed as follows: Evaluate mean, median and mode.

Profits per shop (Rs. in lakhs)	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60
No. of shop	12	18	27	20	17	6

17 Discuss the various types of non – random sampling.

18 The following table shows the ages (X) and systolic blood pressure (Y) of eight persons:

Age (X)	56	42	60	50	54	49	39	45
Blood Pressure(Y)	160	130	125	135	145	115	140	120

Find the regression equation of Y on X and estimate the blood pressure of a 70 – year old person.

19 An IQ test was administered to 5 persons before and after they were trained. The results are given below.

Candidates	1	2	3	4	5
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 the training programme. (1% level).

20 The following table gives the sample psychological health ratings of corporate executive in the field of banking, manufacturing and retailing.

Banking	14	16	18		
Manufacturing	14	13	15	22	
Retailing	18	16	19	19	20

Can we consider the psychological health of corporate executives in the given three fields to be equal at 5% level of significance?

Z-Z-Z

END