

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION- MAY 2024
(Fourth Semester)
Branch – BIOTECHNOLOGY

BIOSTATISTICS

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

1. State whether, The number of individuals in a sample is called as
i) sample number ii) sample size iii) sample error iv) none of these
2. Find the, empirical relationship between mean, median and mode given by Karl Pearson by
i) Mean – Median = 3 (Mean – Median) ii) mode = 3median – 2 mean
iii) median = 3mean – 2 mode iv) None of these
3. Mention the degree of relationship between two variables in correlation is known as
i) Simple Correlation ii) Partial Correlation
iii) Non-Linear Correlation iv) None of the above
4. When we a reject null hypothesis when it is true is known as
i) type I error ii) type II error iii) simple hypothesis iv) critical region
5. When sample sizes are equal the difference between two variances can be tested for small samples through
i) 't' test ii) paired 't' test iii) 'F' test iv) 'Z' test

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

- 6 a) Explain the steps followed in execution of sample survey.
OR
b) Show the merits and demerits of stratified random sampling.
7. a) Summarize the mean for the following data.
X : 5, 7, 6, 10, 8, 3, 4, 12, 20, 24
OR
b) Sketch the mode of the following data.
C.I : 0-10 10-20 20-30 30-40 40-50
f : 5 20 35 20 12
8. a) Explain scatter diagram method of studying correlation.
OR
b) Show that, when $\bar{X} = 36$, $\bar{Y} = 85$, $\sigma_x = 11$, $\sigma_y = 8$, $r = 0.66$, find regression equation of X on Y.
9. a) Classify i) Type I error ii) Type II error and (iii) power of the test.
OR
b) Bring out the various steps followed in the testing of hypothesis.
- 10.a) Narrate the assumptions of ANOVA.
OR
b) In an experiment of immunization of cattle from tuberculosis the following results were obtained.

	Effect	Affected	Unaffected
Treatment			
Inoculated		12	26
Not Inoculated		16	6

Outline the effect of medicine is controlling tuberculosis.

SECTION -C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 x 6 = 30)

- 11.a) Enumerate the methods of allocation of sample to different strata in stratified random sampling.

OR

- b) Trace whether the population consists of a linear trend, then prove that

$$v(\bar{y}_{st}) \leq v(\bar{y}_{sys}) \leq v(\bar{y}_n)_R$$

- 12.a) Infer that, when A stop watch was used to find the running time of group of children in 100m race from the following.

C.I : 0-3	3-6	6-9	9-12	12-15	15-18
f: 2	4	26	47	15	6

- (i) Find mean, median and mode (ii) If check whether the median greater or less than the mean?

OR

- b) Point out your answer with the following data when observing the life span of a few neon lights of a company. Calculate mean deviation and standard deviation.

Life span(Years)	4-6	6-8	8-10	10-12	12-14
No.of Neon lights	10	17	32	21	20

13. a) Discover the problem by the following information relating to waist circumference (X) and abdominal AT(Y) recorded in respect of 10 individuals are given as follows. Obtain correlation coefficient between X and Y.

Waist Circumference (in cm)	74	72	81	83	74	71	80	83	63	73
Abdominal area (in cm)	25	25	42	42	29	21	29	32	11	32

OR

- b) Examine when two regression equations X on Y and Y on X are given from the following data.

$$N=10; \sum X=20; \sum Y=40; \sum X^2=240; \sum Y^2=410; \sum XY=200$$

- 14.a) Analyze, when A machinist is making engine parts with axle diameters of 0.700 inch. A random sample of 10 parts shows a mean diameter of 0.742 inch with a standard deviation of 0.040 inch. Compute the statistic to test whether the work is meeting its specification.

OR

- b) Discover when a Random samples drawn from two countries gave the following data relating to the heights of adult males :-

	Country A	Country B
Mean Height(inches)	67.42	67.25
Standard Deviation (inches)	2.58	2.50
No. of Samples	1000	1200

Is the difference between the means significant?

- 15.a) Elucidatory when a experiment is conducted to compare two types of animal foods A and B the following results were obtained.

Animals	1	2	3	4	5	6	7	8
Food A	49	53	51	52	47	50	52	53
Food B	52	55	52	53	50	54	54	53

Examine whether the mean of food A and Food B differ significantly or not.

OR

- Summarize whether the researchers and number of students at each level of intelligence independent at 5% level of significance.

No. of students in each level	Researcher	
	X	Y
Below average	86	40
Average	60	33
Above average	44	25
Genius	10	2

Z-Z-Z

END