PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2025
(Fourth Semester)

Branch – BIOTECHNOLOGY

BIOSTATISTICS

Time: Three Hours   Maximum: 75 Marks

SECTION-A (10 Marks)
Answer ALL questions
ALL questions carry EQUAL marks   (10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Which of the following best defines a population in statistics? a) A subset of a sample b) The entire group of individuals or items under study c) A randomly selected group from a sample d) A fixed number of observations	K1	CO2
	2	In simple random sampling, each element in the population has: a) A different chance of being selected b) An equal and independent chance of being selected c) A fixed and known probability of being selected d) A zero chance of being selected	K2	CO2
2	3	Mean is a measure of a) location (central value) b) dispersion c) correlation d) none of the above	K1	CO1
	4	If a constant value 5 is subtracted from each observation of a set the variance is: a) reduced by 5 b) reduce by 25 c) unaltered d) increased by 25	K2	CO1
3	5	The range of simple correlation coefficient is a) 0 to ∞ b) −∞ to ∞ c) 0 to 1 d) −1 to 1	K1	CO1
	6	If correlation is 1 then the angle between two regression lines of regression is a) 90° b) 60° c) 30° d) 0°	K2	CO1
4	7	Level of significance is the probability of a) type-I error b) type-II error c) not committing error d) any of the above	K1	CO3
	8	Paired t-test is applicable when the observations in the two samples are a) paired b) correlated c) equal in number d) all the above	K2	CO3
5	9	ANOVA utilizes a) Z-test b) F-test c) t-test d) Chi square test	K1	CO3
	10	Degrees of freedom for Chi Square test in case of contingency table of order (4X3) are: a) 12 b) 9 c) 8 d) 6	K2	CO3

SECTION - B (35 Marks)
Answer ALL questions
ALL questions carry EQUAL Marks   (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	List the difference between sampling and complete enumeration.	K1	CO2
		(OR)		
	11.b.	Discuss the non-probability sampling methods with an examples.		

			K3	CO1
2	12.a.	Compute standard deviation from the following data: 29, 47, 38, 74, 65, 92, 56, 83, 101		
		(OR)		
	12.b.	Discuss on need of coefficient of variation with its properties and uses.		

			K3	CO1
3	13.a.	Discuss on types of correlation with examples.		
		(OR)		
	13.b.	Compute linear regression equation and find out the value of y when $x=12$		

X	1	2	3	4	5
Y	2	5	7	6	8

			K3	CO3
4	14.a.	Brief the following with an examples: i) types of hypothesis ii) types of errors		
		(OR)		
	14.b.	Discuss z-test in single mean and difference between two means.		

			K3	CO3
5	15.a.	Explain ANOVA one way with an example		
		(OR)		
	15.b.	The time taken by workers in performing a job by method I and method II is given below: Do the data show that the variances of time distribution from population from which these samples are drawn do not differ significantly.		

Method I	20	16	26	27	23	22	-
Method II	27	33	42	35	32	34	38

SECTION -C (30 Marks)
Answer ANY THREE questions
ALL questions carry EQUAL Marks   (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Explain the simple, stratified and cluster sampling with its merits and demerits.	K1	CO2
2	17	Discuss the measures of central tendency with its merits and demerits.	K3	CO1
3	18	Compute the correlation coefficient for the following data (in'000) and comment on it:	K3	CO1

Period	Jan	Feb	Mar	Apr	May	Jun
Advt	20	25	28	32	36	40
Sales	30	36	37	41	43	48

4	19	Memory capacity of 10 students was tested before and after training. State whether the training was effective or not from the following scores.	K3	CO3

Before Training	12	14	11	8	7	10	3	0	5	6
After Training	15	16	10	7	5	12	10	2	3	8

5	20	1000 students at college level were graded according to their IQ and the economic conditions of their homes. Use Chi-Square test to find out whether there is any association between economic conditions at home and IQ.	K3	CO3

Economic Conditions	IQ	
	High	Low
Rich	460	140
Poor	240	160

Z-Z-Z   END