22BCP311N

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2025
(Third Semester)

Branch - **BIOCHEMISTRY**

BIOSTATISTICS & RESEARCH METHODOLOGY

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	Descriptive biostatistics uses measures of (a) Variability (b) Central tendency (c) Central tendency and variability (d) Median	K1	CO1
	2	A primary data is (a) Collected by researcher (b) Drawn from existing data (c) Both (d) None	K2	CO1
2	3	Calculate the median: 75,97,100,120,150,175 (a) 6 (b) 110 (c) 34 (d) 105	K1	CO1
	4	A plant physiologist measured the ATP content in roots as follows: 1.05, 1,07, 1.19, 1.45. Calculate skewness based on mean and median. (a) 6 (b) 1.13 (c) 34 (d) 11.3	K2	CO1
3	5	According to the multiplicative rule of probability, and if events A and B are dependent (a) P (A ∩ B) = P(A)×P(B) (b) P (A ∩ B) = P(A)×P(B/A) (c) P (A ∩ B) = P(A/B)×P(B) (d) None of the above	K1	CO1
	6	The mean of the binomial distribution is calculated by multiplying the number of trials by the probability of success (a) Events (b) Probability of success (c) Outcomes (d) All the above	K2	CO1
4	7	SPSS analyses scientific data related with ---------- (a) Science (b) Social Science (c) Humanities (d) Research	K1	CO1
	8	The results of the Duncan's test is a set of subsets of (a) Mean (b) Mean deviation (c) Variation (d) Median	K2	CO1
5	9	_____ includes survey and fault-finding enquiries of difficult fields. (a) Applied research (b) Analytical research (c) Descriptive research (d) Modern Research	K1	CO1
	10	Expand MLA (a) Modern Literature Art (b) Modern Linguistic Association (c) Modern Language Association (d) Modern Literature Association	K2	CO1

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.	Classify the tables used for tabulation of data. Add a note on organization of a table with illustration.	K4	CO4
		(OR)		
	11.b.	Categorically discuss on organizing a statistical survey.		

Cont...

2	12.a.	The following are the heights of two plants in 30 days. Both were fertilized. If the consistency performance is the criterion, calculate which one maintains consistency. X: 35, 54, 52, 53, 56, 58, 52, 50, 51, 49 Y: 108, 107, 105, 105, 106, 107, 104, 103, 104, 101	K3	CO1
		(OR)		
	12.b.	Calculate coefficient of rank correlation from the following data showing marks obtained by students in English (X) and language (Y). X: 8, 36, 98, 25, 75, 82, 92, 62, 65, 35 Y: 84, 51, 91, 60, 68, 62, 86, 58, 35, 49		
3	13.a.	The probability that patients will die within a month after heart transplant is 18%. What is the probability that in three such surgeries 1, 2, or all 3 patients will survive?	K3	CO1
		(OR)		
	13.b.	In a large city, the average number of rats per quarter block is 5. Assume, the occurrence of rat follows Poisson distribution. Find the probability that in a random selected quarter block (1) there are exactly 5 rats (2) there are 5-7 rats (3) there are more than 5 rats (4) there are less than 5 rats.		
4	14.a.	10 fishes each from tank I and II were measured for their length. Calculate the mean difference in body length between the two tanks of fishes is significant or not using student t test ($P_{0.05}$=2.1) I: 20, 24, 20, 28, 22, 20, 24, 32, 24, 26 II: 12, 10, 8, 10, 6, 4, 14, 20, 10, 6	K3	CO1
		(OR)		
	14.b.	RBCs count lac/mm^3 and Hb/g/100mL of 500 persons of test locality was recorded as follows. Is there any significant relation between RBCs and Hb%. Compute using Chi square method. (LS 5% P=3.84) RBCs | Hb% (Above normal | Below normal) | Total Above normal | 85 | 75 | 160 Below normal | 165 | 175 | 340 Total | 250 | 250 | 500		
5	15.a.	Critically examine experimental design and non-experimental design.	K4	CO4
		(OR)		
	15.b.	Analyze types of research.		

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	Elaborate on graphical representation of data.	K5	CO3
2	17	Find the regression equation for the following data. Find the predicted value of x when y=4.5 and y when x=2.25 x: 1, 2, 3, 4, 5 y: 2, 3, 5, 6, 4	K6	CO1
3	18	The following data gives the yield on 12 plots of land in three samples under three varieties of fertilizers. Using ANOVA analyse is there any significant difference in the average yields of land under the three varieties of fertilizers. Given df (2,9) at 5% level 4.26 A | B | C 25 | 20 | 24 22 | 17 | 26 24 | 16 | 30 21 | 19 | 20	K6	CO1
4	19	Discuss open source package for data analysis.	K5	CO3
5	20	Throw light on drafting research proposals for funding agencies.	K4	CO4

Z-Z-Z END