/21

1311E1107

Candidate's Seat No : _____

M.Sc. Sem.-3 Examination

501

Bio-medical Technology

November-2025

Time : 2-30 Hours] **[Max. Marks : 70**

Q-I	**1**	Calculate the 'measures of central tendency' for the given grouped frequency distribution data: Class Interval (Frequency): 0-10 (5); 10-20 (8); 20-30 (15); 30-40 (16); 40-50 (6).	**(14)**
	2	Explain probability sampling methods in brief.	
		OR	
	1	Describe methods of data collection in brief.	
	2	Write a detailed note on the graphical presentation of data.	
Q-II	**1**	A random sample of 12 patients with a specific disorder shows the sample mean heart rate is 108 with a sample standard deviation of 8. Check whether the average heart rate of a random sample of 12 patients differs significantly from a normal value of 72 using one sample t-test. Critical t-value = 2.201	**(14)**
	2	Write a detailed note on the types of hypotheses with an example.	
		OR	
	1	What is a t-test? Explain its usage along with the comparison of its three main types. Mention the formula for the calculation of one sample t-score.	
	2	Explain parametric and non-parametric tests in brief.	
Q-III	**1**	What is primer designing? Write down any two tools used for primer designing in detail.	**(14)**
	2	Explain in detail: SCOP and CATH databases.	
		OR	
	1	Briefly explain KEGG and its different databases along with their applications in biological research.	
	2	Explain in detail: 3D structure display tools. (Any Two)	
Q-IV	**1**	What are the objectives of scientific research? Explain their characteristics.	**(14)**
	2	Explain the role of CCSEA in regulating animal research in India.	
		OR	
	1	Explain the role of various members of the Institutional Human Research Ethics Committee.	
	2	Describe various types of research.	
Q-V		**Answer any SEVEN out of TWELVE.**	**(14)**
	1	Define univariate data with an example.	**02**
	2	What is secondary data?	**02**
	3	Define investigator.	**02**
	4	Define p-value.	**02**
	5	What is the chi-square test?	**02**
	6	Find out the 'mean' and 'grand mean' for the given data: Group A- 3, 4, 3, 2, 3; Group B- 5, 6, 6, 3, 5; Group C- 9, 7, 4, 7, 8.	**02**
	7	What does PIR stand for in bioinformatics?	**02**
	8	What is the purpose of accession numbers in GenBank?	**02**
	9	What is the role of sequence alignment in phylogenetic analysis?	**02**
	10	What is a hypothesis? How is it derived?	**02**
	11	Write various components of the original research paper.	**02**
	12	What is an institutional biosafety committee? What is its role?	**02**

—X—