

## M.Sc Sem-3 Examination

501

## Human Genetics

November-2024

Time : 2-30 Hours]

[Max. Marks : 70

Q-I	1	State the Sum Rule and Product Law. Explain the applications of Probability in Genetics. Determine the probability of producing a homozygous recessive (aabb) offspring in a cross between parents heterozygous for the traits (AaBb).	(14)
	2	What is raw data? Explain data collection and representation.	
	OR		
	1	Why is proper sampling important? Discuss in detail Probabilistic sampling methods.	
	2	State the various measures of dispersion. Calculate SD and SE for the data where $X= 1.3, 2.8, 1.5, 3.9, 2.9, 1.1, 1.5, 2.2, 3.4$	
Q-II	1	What is t-test? Explain its usage along with a comparison of its three main types. Mention the formula for the calculation of one sample t-score.	(14)
	2	Calculate the DFB, DFW, DFTotal, SSW, SSTotal, SSB, MSW, and MSB values from the given data: Group 1: 15, 13, 9, 19, 11; Group 2: 9, 7, 7, 9, 11; Group 3: 3, 7, 13, 3, 5.	
	OR		
	1	What is Chi-square test? Explain its five types with examples and mention the formula for calculation.	
	2	A random sample of 12 patients with a specific disorder shows a sample mean heart rate 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	
Q-III	1	Write a note: MMDB and BioCarta database	(14)
	2	What is Phylogeny analysis? Briefly explain the tools and databases used for phylogeny analysis.	
	OR		
	1	Write an account on SCOP and CATH databases.	
	2	What is Entrez Database? Write down the applications and importance of Entrez database.	
Q-IV	1	Explain the process for the derivation of the hypothesis.	(14)
	2	Write a note on the Institutional Biosafety Committee.	
	OR		
	1	Explain the process for deriving the research problem.	
	2	Write a note on CPCSEA.	
Q-V	Answer any SEVEN out of TWELVE.		(14)
	1	Give 2 examples of Qualitative data in Genetic Studies.	02
	2	Define Median. Write the formula. Find the Median: 0.3, 0.2, 0.5, 0.3, 0.7, 0.4, 0.9.	02
	3	Explain the features of a normal distribution curve.	02
	4	Define null and alternative hypotheses.	02
	5	What is sampling? Mention two different reasons for sampling.	02
	6	Define linear regression. Differentiate between simple and multiple linear regression.	02
	7	What is PFAM?	02
	8	Write down any four applications of OMIM database.	02
	9	What is the Genome Project in NCBI?	02
	10	What is the difference between the impact factor and the H-index?	02
	11	Briefly explain the Empirical Research.	02
	12	Write any four characteristics of good scientific research.	02