0205N171

Candidate's Seat No : _____

MSc Sem.-2 Examination

408

Human Genetics

May-2025

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

Q-I	1	Explain with diagram the process of producing GMOs and its advantages.	(07)
	2	What is genomic DNA library? How is it constructed and list the advantages.	(07)
		OR	**OR**
	1	What is r-DNA technology? List the vectors used along with the functions of each.	(07)
	2	Write a note on: nucleases, polymerases and phosphatases.	(07)
Q-II	1	Describe the common variants of Cas9 enzymes. Give their uses with one example each.	(07)
	2	Write a note on bacterial transformation.	(07)
		OR	**OR**
	1	Briefly describe the advantage of CRISPR/Cas9 over other gene editing methods	(07)
	2	Write a note on BP and LR reactions.	(07)
Q-III	1	Provide a detailed description of the real-time PCR probe-based detection system.	(07)
	2	Explain the process of DNA foot-printing and draw a labelled diagram for it.	(07)
		OR	**OR**
	1	Discuss in detail: Steps involved in the DNA isolation process from blood.	(07)
	2	What are the essential factors to take into account when designing primers? Give a detailed account of it.	(07)
Q-IV	1	Give the full form of RFLP and describe it in detail.	(07)
	2	What is capillary sequencing? Provide a detailed account of its procedure and draw a diagram.	(07)
		OR	**OR**
	1	What is Western blotting? Briefly explain the steps with a diagram.	(07)
	2	Describe the process of DNA sequencing by the chain termination method.	(07)
Q-V		**Answer any SEVEN out of TWELVE.**	(14)
	1	Give advantages of c-DNA library.	02
	2	What is the function of reverse transcriptase?	02
	3	Give the limitation of Taq polymerase.	02
	4	Draw the structure of CRISPR/Cas9 and its association with template DNA.	02
	5	What are the advantages of a recombination-based cloning system over a traditional cloning system?	02
	6	How is transformation efficiency calculated?	02
	7	Mention four fluorescence dyes that are applied in the detection of the amount of dsDNA available during RT-PCR.	02
	8	What are the three critical phases of PCR, and what are the temperature settings for each phase?	02
	9	The full name of VNTR is _____, and STR is _____.	02
	10	What are the three major steps followed in performing the Southern blotting technique?	02
	11	To cleave the bond between ribose sugar and the guanine base in chemical degradation sequencing, what chemical treatment is used?	02
	12	What are two approaches used to map the arrangement of restriction fragments on a DNA strand?	02