

## MSc Sem.-2 Examination

408

Zoology

May-2025

Time : 2-30 Hours]

[Max. Marks : 70

Q-I	1	Write a note on Cas9.	(14)
	2	Explain the process of plasmid transformation in bacteria.	
	OR		
	1	Explain the functioning of CRISPR/Cas9 with one example.	
	2	Explain BP and LR reactions.	
Q-II	1	Give a detailed explanation of the applications of vectors used in r-DNA technology.	(14)
	2	Write a note on the enzymes used in recombinant DNA technology.	
	OR		
	1	Write the applications of GMOs.	
	2	What is a cDNA library? Explain in detail.	
Q-III	1	Provide the information about important variables to keep in mind when choosing primers for PCR.	(14)
	2	Explain in detail the process and steps involved in isolating DNA from blood.	
	OR		
	1	Describe the DNA foot-printing process using a labelled diagram.	
	2	Discuss in detail: The real-time PCR probe-based detection system.	
Q-IV	1	Explain the sequencing technique described by Sanger and co-workers in 1977.	(14)
	2	Draw a diagram of Western blotting and give a concise explanation of how the technique works.	
	OR		
	1	Draw a diagram and discuss the capillary sequencing technique in depth.	
	2	Give a comprehensive account of restriction fragment length polymorphism.	
Q-V	Answer any <b>SEVEN out of TWELVE</b> .		(14)
	1	Draw the structure of CRISPR/Cas9 and its association with template DNA.	02
	2	Give the difference between the donor and the destination vector.	02
	3	Explain the process of selecting the plasmid-transformed bacterial cells.	02
	4	Give the limitation of Taq polymerase.	02
	5	What are two types of artificial vectors?	02
	6	What are expression vectors?	02
	7	What are the three key steps in PCR, and what temperatures are applied during each step?	02
	8	Give four examples of fluorescence dyes used in qPCR.	02
	9	Provide the full name of VNTR and STR.	02
	10	Provide two different terms used for the Maxam-Gilbert DNA sequencing method.	02
	11	Name the three essential steps required to carry out Southern blotting.	02
12	Mention two methods used to figure out the correct order of restriction fragments in a DNA sequence.	02	