U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

July 2023 Semester End Main Examinations

Program: B.E. **Semester: VI**
Branch: Biotechnology **Duration: 3 hrs.**
Course Code: 19BT6DE4GIN **Max Marks: 100**
Course: Genomic Informatics **Date: 19.07.2023**

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			UNIT – I	CO	PO	Marks
1	a)		Compare all three generations of sequencing technologies.	*CO1*	*PO*	**10**
	b)		List various NGS file formats. Discus any one briefly.	*CO1*	*PO*	**05**
	c)		How do you carry out DNA sequencing by exploiting torrent of H+ ions? Illustrate with explanation.	*CO1*	*PO*	**05**
			OR			
2	a)		Identify a method where light emission is used for genome sequencing. Write its principle and steps involved with figures.	*CO1*	*PO*	**10**
	b)		"DNA sequencing can be done for single large molecule of DNA in real time". Justify this statement by identifying the method and steps involved with figures.	*CO2*	*PO5*	**10**
			UNIT – II			
3	a)		Using velvet how do you assemble genome? Identify the algorithm behind it and write the steps involved with diagrammatic representations.	*CO2*	*PO5*	**10**
	b)		Develop a pipeline for denovo genome assembly. Explain it with neat figures.	*CO2*	*PO5*	**10**
			UNIT – III			
4	a)		How do you assemble genome with greedy approach? Explain it with at least two examples.	*CO3*	*PO2 PO12*	**10**
	b)		Without genome browsers it is difficult to understand, view and analyze the genomic data. Justify this by stating the importance of genome browser, provide examples of genome browsers and explain one in detail.	*CO3*	*PO2 PO12*	**10**

			UNIT – IV			
	5	a)	lncRNA play an important role in normal and disease process. Justify this statement by explaining role in diagnosis and treatment of cancer with suitable examples.	*CO4*	*PO1*	**10**
		b)	How can you employ NGS in cancer research? Substantiate by explaining various methods of NGS.	*CO4*	*PO1*	**10**
			OR			
	6	a)	RNA sequencing plays a crucial role in identifying biomarkers. Justify this by outlining the procedure and any four applications in cancer research.	*CO4*	*PO1*	**10**
		b)	What is epigenome? Identify different approaches and sequencing strategies for epigenome with neat figures.	*CO4*	*PO5*	**10**
			UNIT – V			
	7	a)	Provide reasons to state that NGS is valuable in clinical oncology.	*CO4*	*PO5*	**10**
		b)	Classify polymorphism. Give examples of polymorphic genes in major depression.	*CO4*	*PO5*	**10**

****