U.S.N.										

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

Autonomous Institute Affiliated to VTU

January 2024 Semester End Main Examinations

Programme: B.E. **Semester: VII**
Branch: Information Science and Engineering **Duration: 3 hrs.**
Course Code: 20IS7BSBIO **Max Marks: 100**
Course: Biology for IT Engineers

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.

				CO	PO	Marks
			UNIT - I			
1	a)	What is Brain Computer Interfacing (BCI)? With a neat diagram explain the various components of Brain Computer Interface.		CO2	PO1	**08**
	b)	What are Neurons? Explain the parts of a neuron with a neat diagram.		CO1		**08**
	c)	Explain in detail about the significance of Action Potentials		CO2	PO1	**04**
		UNIT - II				
2	a)	Explain the process of DNA →RNA → Protein formation in detail.		CO4	PO2	**10**
	b)	What are the genes that encode proteins and how can we find the various features such as genes, regulatory motifs, and other functional elements in the genomic sequence?		CO3	PO2	**06**
	c)	Explain the following terms i) DNA ii) RNA iii) Protein		CO3	PO2	**04**
		OR				
3	a)	Discuss the various reasons why computational biology has emerged as an important discipline in recent years.		CO3	PO2	**10**
	b)	Explain in detail the Central Dogma of molecular biology.		CO3	PO2	**10**
		UNIT - III				
4	a)	Briefly explain the steps involved in genomic data analysis.		CO4	PO2	**10**
	b)	Which are things(in terms of query) that can be measured by high-throughput assays?		CO4	PO2	**06**
	c)	Explain gene expression with an example.		CO4	PO2	**04**
		OR				

	5	a)	Explain how genes are controlled using transcriptional and post-transcriptional regulation.	*CO5*	*PO3*	**08**
		b)	Elaborate the common steps of high – throughput sequencing with a neat sketch.	*CO4*	*PO2*	**08**
		c)	Why should we use R for Genomics?	*CO4*	*PO2*	**04**
			UNIT - IV			
	6	a)	Depict with a neat diagram about Denaturation and Renaturation.	*CO4*	*PO2*	**08**
		b)	If the length of DNA strand is 106A∘ then, what will be the number of nucleotides present in a DNA molecule? (Given: The distance between consecutive nitrogenous bases is 3.4 A°.)	*CO5*	*PO3*	**04**
		c)	Explain with a neat diagram how the shortening of DNA is done by Exonuclease III & Exonuclease Bal31 is done.	*CO5*	*PO3*	**08**
			UNIT - V			
	7	a)	What are the steps involved in the Basic Genetic algorithm? Explain with an example.	*CO5*	*PO3*	**10**
		b)	Define the following terms **i.** Chromosome **ii.** Genome **iii.** Population **iv.** Search space	*CO4*	*PO2*	**04**
		c)	Suppose that l (string length) is 6, that $f(x)$ is equal to the square of string x. Calculate Fitness value and its percentage. Chromosome | String A | 110101 B | 101101 C | 111001 D | 101100	*CO5*	*PO3*	**06**

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