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B.Tech/M.Tech(Integrated) DEGREE EXAMINATION, DECEMBER 2023

First and Second Semester

21BTB102T - INTRODUCTION TO COMPUTATIONAL BIOLOGY

(For the candidates admitted during the academic year 2022-2023 onwards)

Note:

i. **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.

ii. **Part - B** and **Part - C** should be answered in answer booklet.

Time: 3 Hours **Max. Marks: 75**

PART - A (20 × 1 = 20 Marks)

Answer **all** Questions

		Marks	BL	CO
1.	Meiosis produces (A) Haploid (B) Diploid (C) multiploidy (D) uniploid	1	2	1
2.	The genetic algorithm is inspired by (A) nature (B) nervous system (C) evolution (D) (d) immunsystem	1	2	1
3.	Efferent pathway is (A) brain to motor neurons (B) heart to brain (C) sensory neuron to brain (D) lungs to brain	1	1	1
4.	Sister chromatids are separated in mitosis at (A) prophase (B) anaphase (C) metaphase (D) interphase	1	1	1
5.	The RNA attached to ribosomes are (A) tRNA (B) gRNA (C) mRNA (D) rRNA	1	1	2
6.	What is the bond between nucleotides (A) alkyl (B) glycosidic (C) peptide (D) phosphodiester	1	1	2
7.	"DNA is different from RNA because of" -Find the odd one (A) single stranded (B) 5' oxygen (C) uracil (D) more stable	1	2	2
8.	UNIPROTKB is a Sequence database for (A) nucleic acids (B) proteins (C) DNA (D) lipids	1	1	2
9.	Example of natural passive immunity is (A) mother's antibodies (B) vaccine (C) bacterial infection (D) Viral Infection	1	1	5
10.	The idea behind this _____approach is that close protein homologs should adopt the same secondary and tertiary structure. (A) homology (B) biology (C) scientific (D) orthology	1	2	3
11.	Arrange the following (1) protein (2) transcription (3) translation (4)splicing (5)protein folding (A) 12345 (B) 24315 (C) 23541 (D) 15234	1	2	2

12.	Metallo protein is a_____ protein (A) derived (B) conjugated (C) simple (D) unconjugated	1	2	3
13.	_____ codon for starting translation (A) AUG (B) ACU (C) AAU (D) UAG	1	2	2
14.	The resting potential for a neuron is _____ (A) 70 mV (B) -35 mV (C) -24 mV (D) -70 mV	1	2	4
15.	ANN is a type of neural network that performs like a _____ (A) human (B) datamining algorithm (C) machine learning tool (D) apes	1	2	4
16.	The weights in a neural network is equivalent to _____ of the neuron (A) axon (B) nucleus (C) synapse (D) cell body	1	2	4
17.	_____ are many and _____ is one in a nerve cell (A) dendrites, axon (B) axon , dendrites (C) soma, axon (D) axon, soma	1	2	4
18.	The _____vaccines contain live virus particles with low levels of virulence (A) inactivated (B) subunit (C) attenuated (D) recombinant	1	1	5
19.	_____ is a T cell epitope prediction method (A) NetMHCpan (B) BLAST (C) Bepitope (D) Tepitope	1	2	5
20.	Find the disease for which vaccines are unavailable (A) chicken pox (B) malaria (C) whooping cough (D) diptheria	1	2	5

PART - B (4 × 10 = 40 Marks)
Answer **any 4** Questions

		Marks	BL	CO
21.	Give a note on genetic algorithms	10	1	1
22.	Write a detailed note on carbohydrates with illustrated examples	10	1	2
23.	Write a detailed note on secondary structure prediction tools	10	1	3
24.	Write on translation in detail with neat diagrams	10	1	3
25.	Explain artificial neural network with example	10	1	4
26.	Explain innate and acquired immunity explaining the differences	10	2	5

PART - C (1 × 15 = 15 Marks)
Answer **any 1** Questions

		Marks	BL	CO
27.	Explain the development of vaccines for SARS-CoV2 virus	15	3	5
28.	You have a database of cancer cell images. Explain a machine learning algorithm that you could use for predicting cancer in cell images	15	3	4

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