B.Tech. / M.Tech (Integrated) DEGREE EXAMINATION, JANUARY 2023
First Semester

21BTB102T – INTRODUCTION TO COMPUTATIONAL BIOLOGY
(For the candidates admitted from the academic year 2022-2023)

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 = 20Marks)
Answer **ALL** Questions

	Marks	BL	CO	PO

1. In cell division, _____ is for growth and maintenance.   `1  1  1  4`
   (A) Cytokinesis   (B) Meiosis
   (C) Interphase   (D) Mitosis

2. The genetic material of a prokaryotic is present in the   `1  1  1  4`
   (A) Nucleus   (B) Cytoplasm
   (C) Nucleoid   (D) Plasmid

3. The term "Cell" was given by   `1  1  1  4`
   (A) Robert Hooke   (B) Jatum
   (C) Schwann   (D) Debary

4. Ribosomes are also known as   `1  1  1  4`
   (A) Power house   (B) Store house
   (C) Protein factory   (D) Suicide bag

5. Genetic information is stored in the formed of   `1  1  2  1`
   (A) tRNA   (B) mRNA
   (C) DNA   (D) RNA

6. Blastocyst is   `1  1  2  1`
   (A) Totipotent cell   (B) Embryo
   (C) Zygote   (D) Early stage of embryo

7. DNA is made of hydrogen bands they are   `1  1  2  1`
   (A) Ionic bond   (B) Covalent bond
   (C) Vander walls interaction   (D) Non bonded interaction

8. A program compares amino acid query sequence against a protein sequence database   `1  1  2  1`
   (A) BLASTn   (B) BLASTp
   (C) BLASTx   (D) TBLASTx

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9. Protein synthesis stops when encountering stop codon — 1 1 3 2
   (A) AUG　　　　　　　　　　(B) GGA
   (C) UGA　　　　　　　　　　(D) CGA

10. The amino acids are assembled into a polypeptide in — 1 1 3 2
    (A) mRNA　　　　　　　　　(B) Ribosome
    (C) DNA　　　　　　　　　　(D) RNA

11. Non-proteinaceous molecule needed for enzyme activity is called — 1 1 3 2
    (A) Cofactors　　　　　　　(B) Enzymes
    (C) Hormones　　　　　　　(D) Inhibitors

12. Pymol is a — 1 1 3 2
    (A) Visualization tool　　　(B) Statistic tool
    (C) Python tool　　　　　　(D) Sequence analysis tool

13. Which of the following cells have star shaped structure? — 1 1 4 1
    (A) Microglia　　　　　　　(B) Digodendrocytes
    (C) Astrocytes　　　　　　 (D) Schwann cells

14. Synaptic signaling involves — 1 1 4 1
    (A) Autocrine signals　　　(B) Paracrine signals
    (C) Neurotransmitters　　　(D) Neurochannel signals

15. The connecting weights in a ANN is equivalent to _____ of neuron. — 1 1 4 1
    (A) Soma　　　　　　　　　(B) Axon
    (C) Dendrite　　　　　　　(D) Synapse

16. Parkinson's is caused by — 1 1 4 1
    (A) Amyloid plaques　　　　(B) Neurofibrillary tangles
    (C) Dopamine related neurons　(D) Spongiform

17. _____ is a plasma-like liquid carried by lymphatic circulation. — 1 1 5 1
    (A) Lymph　　　　　　　　(B) Blood
    (C) Saliva　　　　　　　　(D) Gastric juices

18. Polio drops are administered at infant stage because — 1 1 5 1
    (A) It increases RBC count　(B) Helps better digestion of antigens
    (C) Corrects bone marrow stem cells　(D) Produces antibodies

19. Tc cells are — 1 1 5 1
    (A) Cytotoxic T cells　　　(B) Cellular T cells
    (C) Ciliated T cells　　　　(D) Cell mediated T cells

20. Epitope prediction of B cell is based on — 1 1 5 1
    (A) Linear　　　　　　　　(B) Conformational
    (C) Long　　　　　　　　　(D) Core of antigen

PART – B (4 × 10 = 40 Marks)
Answer ANY FOUR Questions

	Marks	BL	CO	PO
21. Give the different organelles of cells. Briefly its structure and function.	10	2	1	4
22. Describe what is DNA and RNA?	10	2	2	1
23. Write the types of secondary structure prediction tools.	10	2	3	2
24. Describe machine learning and its uses in biology.	10	2	4	1
25. Illustrate with neat diagrams cell mediated immune response.	10	2	5	1
26. Detailed overview of stem cell technology.	10	2	1	4

PART – C (1 × 15 = 15 Marks)
Answer ANY ONE Questions

	Marks	BL	CO	PO
27. Give the algorithm to predict similar sequences to a protein sequence using a database.	15	4	2	1
28. What are the immune processes that happen when we got vaccinated for COVID?	15	4	5	1

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