

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
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|---|---|---|---|---|
| 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 | | | | |

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

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

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

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

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

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

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

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

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

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

19. Tc cells are
 (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
 (A) Linear (B) Conformational
 (C) Long (D) Core of antigen

1	1	3	2
1	1	3	2
1	1	3	2
1	1	3	2
1	1	4	1
1	1	4	1
1	1	4	1
1	1	4	1
1	1	5	1
1	1	5	1
1	1	5	1

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PART – B ($4 \times 10 = 40$ 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 ($1 \times 15 = 15$ 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