Reg. No.															

B.Tech. / M.Tech. (Integrated) DEGREE EXAMINATION, JANUARY 2024
First Semester

21BTB102T – INTRODUCTION TO COMPUTATIONAL BIOLOGY
(For the candidates admitted from the academic year 2023 - 2024)

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) — Marks | BL | CO
Answer **ALL** Questions

1. A sequence of amino acids bonded together by _____bonds. — 1 | 1 | 1
   (A) Hydrogen (B) Glycosidic bond
   (C) Peptide (D) Ionic

2. Homologous partner of chromosome for X is — 1 | 1 | 1
   (A) XY (B) 23
   (C) Y (D) 1

3. Inner cell mass is obtained from _____ — 1 | 2 | 1
   (A) Blastocyst (B) Morula
   (C) Gastrula (D) Zygote

4. The transfer of genetic material through viruses is called — 1 | 2 | 2
   (A) Translation (B) Transduction
   (C) Conjugation (D) Transformation

5. Cholesterol is a _____ — 1 | 2 | 5
   (A) Steroid (B) Transporter
   (C) Enzyme (D) Synthetic compound

6. DNA is different from RNA because of the base — 1 | 2 | 2
   (A) Cytosine (B) Guanine
   (C) Uracil (D) Adenine

7. The algorithm compares a protein query sequence against a nucleotide sequence database dynamically translated in all reading frames. — 1 | 2 | 2
   (A) BLASTn (B) BLASTp
   (C) tBLASTn (D) BLASTx

8. The mechanism of delivering amino acids for translation is done by — 1 | 2 | 2
   (A) tRNA (B) gRNA
   (C) mRNA (D) rDNA

9. PDB was established in 1972 at _____ 1 2 3
   (A) BNL (B) CNL
   (C) RCSB (D) GGE

10. _____determines the propensity or intrinsic tendency of each residue to be in the helix, strand, and β-turn conformation 1 2 3
   (A) PHD (B) Chou Fasman
   (C) GOR (D) PROTFUN

11. Which among these is odd? 1 2 3
   (A) Space fill (B) Ribbon
   (C) Side chain model (D) Ball and stick

12. The anticodon for ACU is 1 2 3
   (A) TGA (B) GAT
   (C) UGA (D) UCA

13. Clustering is a type of _____machine learning algorithm. 1 1 3
   (A) Supervised (B) Unsupervised
   (C) Reciprocal (D) Cosupervised

14. Albert Einstein had inordinate number of _____cells. 1 1 4
   (A) Nerve (B) Glial
   (C) Liver (D) Brain cells

15. The spiking period is followed by a _____period. 1 2 4
   (A) Refractory (B) Resolution
   (C) Unspike (D) Unrest

16. Alzheimer's disease causes deficit in _____ 1 2 4
   (A) Proteins (B) Hormones
   (C) Cognition (D) Sugars

17. Diphtheria and tetanus are developed as _____vaccine. 1 2 5
   (A) Peptide (B) Live
   (C) Recombinant (D) Toxoid

18. _____is a agranular leukocyte. 1 2 5
   (A) Basophil (B) Eosinophil
   (C) Monocyte (D) Lymphocyte

19. MHC is present on _____ 1 2 5
   (A) Human cells (B) Bacteria
   (C) Virus (D) Parasite

20. Antibodies are made from _____cells. 1 1 5
   (A) B (B) T
   (C) NK (D) M

PART – B (4 × 10 = 40 Marks)

Answer **ANY FOUR** Questions

		Marks	BL	CO
21.	Provide a comprehensive enumeration of the different organelles that are present in a cell?	10	1	1
22.	Describe biochemistry of carbohydrates in detail.	10	1	2
23.	Give the tools for the prediction of secondary structure in proteins.	10	1	3
24.	Describe machine learning methods for biology.	10	1	4
25.	Give a detailed note on humoral immune response.	10	2	5
26.	List the types, properties and future applications of stem cell technology.	10	1	1

PART – C (1 × 15 = 15 Marks)

Answer **ANY ONE** Questions

		Marks	BL	CO
27.	Cell theory – Device experiments to prove them.	15	3	1
28.	What the body does, in reaction, when a vaccination is given to it.	15	3	4

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