

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

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

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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