| Reg. No | | | | | | | | | | | | | | | |
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# B.Tech/M.Tech(Integrated) DEGREE EXAMINATION, DECEMBER 2023

First 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. | Which of the following is responsible for the transport of materials from the environment to cells?<br>(A) flagella (B) Mitochondria<br>(C) Endoplasmic reticulum (D) Plasma membrane | 1 | 1 | 1 |
| 2. | Sugar in DNA molecules is<br>(A) Deoxy ribose (B) dioxy ribose<br>(C) deoxy ribulose (D) Ribose | 1 | 2 | 1 |
| 3. | Hydrogen bonds in protein are responsible for<br>(A) alpha helix (B) primary structure<br>(C) tertiary structure (D) peptide formation | 1 | 1 | 3 |
| 4. | Peptide bonds are formed between<br>(A) amino group of adjacent amino acids (B) amino group and carboxyl group of adjacent amino acids<br>(C) amino group and carboxyl group of distant amino acids (D) carboxyl group of amino acids | 1 | 2 | 1 |
| 5. | Cell characteristics are controlled by<br>(A) Endoplasmic reticulum, (B) genes<br>(C) nuclear envelop (D) Nucleolus | 1 | 1 | 1 |
| 6. | Genetic information is stored in the form<br>(A) RNA (B) DNA<br>(C) r RNA (D) mRNA | 1 | 1 | 2 |
| 7. | Which of the following is pluripotent stem cells<br>(A) Zygote (B) Inner mass cells<br>(C) blood stem cells (D) gametes | 1 | 1 | 1 |
| 8. | Enzymes in Biosensors<br>(A) Immobilized (B) inhibited<br>(C) mobilized (D) heat inactivated | 1 | 1 | 2 |
| 9. | The traditional method widely used to recycle nutrients in garden and yard waste is<br>(A) Composting (B) Bio apiles<br>(C) Land forming (D) bioreactor | 1 | 1 | 2 |
| 10. | Polio drops are administered at infant stage because of it<br>(A) Helps in better digestion of antigens (B) Increases RBC count<br>(C) Produces antibodies (D) bone marrow stem cells synthesis | 1 | 1 | 2 |

| | | | | |
|---|---|---|---|---|
| 11. | Alzeimers disease is<br>(A) Long term Memory loss (B) Heart disease<br>(C) skin allergy (D) Fever | 1 | 4 | 3 |
| 12. | Which of the following interactions is crucial for the primary structure of proteins?<br>(A) Hydrogen bond (B) Di-sulfide bond<br>(C) Vander Waals interactions (D) Peptide bond | 1 | 2 | 3 |
| 13. | Which of the following represents the two-dimensional structure of proteins?<br>(A) quarternary (B) Secondary<br>(C) Tertiary (D) Primary | 1 | 1 | 2 |
| 14. | The transmission of a nerve impulse from one neuron to the next is effected by<br>(A) neurotransmitters (B) hormones<br>(C) receptors (D) cerebrospinal fluid | 1 | 1 | 4 |
| 15. | _____ is a plasma-like liquid carried by lymphatic circulation<br>(A) Saliva (B) Blood<br>(C) Endocrine secretion (D) Lymph | 1 | 2 | 5 |
| 16. | The human nervous system is composed of two types of cells namely nerve cells and .....cells<br>(A) Nephron (B) Endocrine<br>(C) Glial (D) Hepatic | 1 | 1 | 4 |
| 17. | Immunity formed in an individual due to antigenic stimulus is<br>(A) Naturalimmunity (B) acquired immunity<br>(C) Passive immunity (D) Active immunity | 1 | 2 | 5 |
| 18. | Which of the following is NOT an example of an autoimmune disease?<br>(A) Influenza (B) Rheumatoid Arthritis<br>(C) Multiple sclerosis (D) Lupus | 1 | 1 | 4 |
| 19. | Active acquired immunity is a result of<br>(A) vaccination (B) contact with apathogen<br>(C) Injection of an immune serum (D) antibodies of the mother | 1 | 5 | 5 |
| 20. | This type of disease results from the inability of the immune system to distinguish self from nonself antigens<br>(A) autoimmune diseases (B) genetic disorders<br>(C) diabetics (D) cholera | 1 | 2 | 5 |

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

| | | Marks | BL | CO |
|---|---|---|---|---|
| 21. | Write the differences between Prokaryotes and Eukaryotes | 10 | 2 | 1 |
| 22. | Describe the process of cell division that helps in growth of organism | 10 | 4 | 2 |
| 23. | Explain about the various chemical bonds with examples | 10 | 1 | 1 |
| 24. | Write about The human genome project | 10 | 3 | 2 |
| 25. | Explain how Protein structures cab be predicted computationally | 10 | 4 | 3 |
| 26. | Give an account how computational methods help in immunology. | 10 | 3 | 5 |

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

| | | Marks | BL | CO |
|---|---|---|---|---|
| 27. | Explain how cell organelles help in structure and function of cell with neat diagrams | 15 | 4 | 1 |
| 28. | Draw and explain the structure of DNA and add a short note on Artificial intelligence | 15 | 4 | 5 |

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