D.S.

B. Tech (Honors) in Data Sciences

University Teaching Department, CSVTU, Bhilai

Subject: Fundamentals of Computational Biology

Class Test 1-January 2022

Time: 1:30 hrs. **Max. Marks: 40**

Attempt all questions from each section.

Section A: Multiple Choice Questions: **(1×10)**

I. A square bottom box without cover is made from a material that costs $ 0.75 per square metre for the sides and $ 0.95 per square metre for the bottom. Express the total cost of the material required to construct the box in function of its width and height.
x: Length of the bottom side; h: height of box (in metres).

a. $0.95x^2 + 4(0.75xh)$ **b.** $0.95x + 2(0.75h)$
c. $0.75x^2 + 2(0.95xh)$ **d.** $0.95x + 2(0.75xh)$

II. In an experiment the researcher manipulates the _____ variable and measure the_____ variable.

a. independent, dependent **b.** dependent, independent
c. causal, spurious **d.** spurious, causal

III. If A is m x n matrix, such that AB & BA both are defined, then B is a matrix of the order

a. n x n **b.** m x m **c.** m x n **d.** n x m

IV. In competitive inhibition, inhibitors bears a close structural similarity with the

a. Co-enzyme **b.** Co-factor **c.** Prosthetic group **d.** Substrate

V. The nucleus contains

a. Mitochondria **b.** Golgi apparatus **c.** Chromosomes **d.** Lysosomes

VI. Lag phase is also known as _____

a. period of initial adjustment **b.** transitional period

c. generation time **d.** period of rapid growth

VII. A graph is a collection of

a. Vertices and Edges **b.** Rows and Columns

c. Equations **d.** All of the above

VIII. The movement of individuals into a population

a. Dispersion **b.** Emigration **c.** Immigration **d.** All of the above

IX. Number of organisms per unit of living area

a. Population density **b.** Carrying Capacity **c.** Dispersion **d.** Both a. and b.

X. Cancer cells use important enzymatic tools known as _____ like swords to cut through the extracellular matrix (surrounding tumor region) in order to achieve migration and metastatic growth.

a. Proteases **b.** Lipases **c.** Hydrolases **d.** All of the above

Section B: Descriptive Type Questions: **(6×5)**

1. Derive an equation to show the substrate decay using first order kinetics.

2. Discuss the different growth phases along with diagram; also, explain the different forms of growth equation.

3. Explain the different models of infectious diseases along with example.

4. What do you cancer? Explain the different models associated with its spread?

5. What are the different forms of graphs used for representing biological data? Explain, Which graph is appropriate for particular condition along with example?