



# United International University

## School of Science and Engineering

Mid-term Examination; Year 2023; Trimester: Spring  
Course: BIO 3105; Title: Biology for Engineers; Sec: A-C  
Full Marks: 30; Time: 1 hr 45 mins

There are Five Questions, 1, 2, and 3 are mandatory to answer, and answer 4 or 5 (anyone).

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|----|---|---|-----|
| 1. | (a) Describe the importance of check points in the cell division.   | 1 | CO1 |
|    | (b) Define tissue and organ.  | 2 | CO1 |
|    | (c) Define Genetic code and describe its characteristics.   | 2 | CO1 |
|    | (d) Show cell overview.   | 2 | CO1 |
| 2. | (a) Apply your idea that can be implemented as business models. The ideas need to be environment friendly.  | 3 | CO2 |
|    | (b) The dominant gene for eyes creates a black eye, while a recessive gene creates ash one. If you see 75% of the second-generation children have black eye, what were the traits of the actual parents (2 generations before)? | 2 | CO2 |
|    | (c) Predict the reasons for having interphase in mitosis and meiosis in relation to production of cells.  | 3 | CO2 |
| 3. | (a) Can you design a project using nanoparticles in the field of cancer treatment using your own background? Explain how you can implement your expertise there.  | 3 | CO3 |
|    | (b) Protein, phospholipid and cholesterol are the integral part of cell membrane. Would you implement the ways of transport of the nutrients across cell membranes.   | 3 | CO3 |
|    | (c) One baby has born with $3n$ and another baby with $2n - 1$ chromosomes. Create your assumption in which functions of cell division results in formation of these numerical anomalies.                                       | 2 | CO3 |
| 4. | (a) Give logical explanation how Ecosystems and evolution are intertwined?  | 3 | CO4 |
|    | (b) Clarify that lysosome acts as cell recycling centre.  | 4 | CO4 |
| 5. | (a) Justify DNA is a stable genetic material in comparison to RNA.  | 3 | CO4 |
|    | (b) Explain where nuclear envelop dissolves and form in the mitosis. Differentiate the Anaphase of meiosis 1 and mitosis.   | 4 | CO4 |

CO1: Describe different biological quantities.  
CO2: Apply the knowledge of biological systems in a real-life problem.  
CO3: Design several biological systems with constraints.  
CO4: Explain several procedures for solving biological systems within constraints.