United International University
School of Science and Engineering
Mid-term Examination; Year 2023; Trimester: Fall
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).*

1.	(a) Describe the function of Chloroplast.	1	CO1
	(b) Specify the three reasons for cell division.	2	CO1
	(c) Illustrate the structure of a DNA.	2	CO1
	(d) Name the absolute smallest unit of life and define it.	2	CO1
2.	(a) A computer engineer can work in the medical field. Apply your ideas into practice for how you can help this industry.	3	CO2
	(b) Even so, genetic material consists of both DNA and RNA. Decide which is pure genetic material, then provide an explanation.	2	CO2
	(c) The cell's packaging centre creates a crucial organelle that aids in cell renewal and allows foreign objects to be ingested that enter the cell. Use your knowledge about the cell organelles that are in charge of this process. lysosome	3	CO2
3.	(a) The length of a human cell's DNA is around three meters. Provide an example of how this DNA stays inside a cell.	3	CO3
	(b) Let's say you have a Persian cat that has both light and dark brown eyes, which is a prominent feature. What proportion of dark brown eyes would there be in the second generation?	3	CO3
	(c) One newborn was born with several haploid chromosomes in its somatic cells. Create an assumption about the ways that these numerical anomalies are formed as a result of cell division functions.	2	CO3
4.	The polarity of the two DNA chains is anti-parallel. Interpret using a pictorial perspective and its structure.	3	CO4
	(b) You placed a selectively permeable membrane "bag" with a hypotonic solution into a beaker with a hypertonic solution. Predict what will happen and why?	4	CO4
5.	(a) Meiosis generates haploid cells, while mitosis results in diploid cells. Explain it using the stages of cell division.	3	CO4
	(b) Demonstrate the connection between Ecosystems and Evolution.	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.