



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).

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.