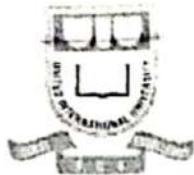


United International University

School of Science and Engineering



Final Examination; Year 2025; Trimester: Spring

Course: BIO 3105/3107; Title: Biology for Engineers/Biology;

Sec: All

Full Marks: 40; Time: 2 hours

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

1. ✓ a. How can you produce insulin in *E.coli* bacteria using recombinant DNA technology? 4 CO4
✓ b. Discuss the correlation between memory cells and secondary immune response. 2 CO1
✓ c. "Our diet influences our mental health" – Justify the statement. 2 CO3
✓ d. Immune system becomes underactive in some people. Interpret the reasons behind underactivity. 2 CO2
2. ✓ a. Polymerase chain reactions amplify DNA fragments into million copies. Illustrate the workflow. 4 CO3
✓ b. "Healthy diets can prevent NCDs"- do you agree? Comment on the statement. 2 CO2
✓ c. The recurrence of SARS-COV2 infections is becoming a major threat. Describe how vaccination can prevent this infection? 4 CO4
3. ✓ a. What do you understand by innate and adaptive immunity? Compare and contrast. 4 CO4
✓ b. How can gene therapy be used to treat genetic disorders? 2 CO2
c. Explain the concept of balanced diet with diagram. 2 CO1
✓ d. "Restriction enzyme makes a cut in specific sequence of DNA" – explain the mechanism. 2 CO1
- ✓ 4. a. Gel electrophoresis separates DNA according to its' size. Summarize the technique. 5 CO4
b. What is meant by the food pyramid? Explain how your calorie consumption fits within the dietary pyramid. 5 CO3
- ✓ 5. a. Assume an individual weighs 85 kg and has a height of 160 cm. Calculate their Body Mass Index (BMI) and interpret the result. Based on this, what dietary recommendations would you suggest for the individual. 5 CO2
b. "Agricultural application of Biotechnology has a huge prospect in Bangladesh" – give your opinion on this aspect. 5 CO1

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