



United International University

School of Science and Engineering

Final Examination; Year 2021; Trimester: Fall

Course: BIO 3105; Title: Biology for Engineers; Sec: A-D

Full Marks: 40; Time: 2 hrs + 15 mins upload time

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

1. (a) What are the consequences if we give up DDT in the environment? 2 CO1
(b) What are the natural external factors of a land based ecosystem? 2 CO1
(c) Sketch a PCR reaction including polarities of your DNA. 2 CO1
(d) Sketch a diagram to show the ingredients you have to take on a daily basis. 2 CO1
(e) What are the significances of using agarose gel in gel electrophoresis? 2 CO1
2. (a) Do you think you can design and contribute in a project in the area of molecular diagnosis from your own background? 4 CO3
(b) Suppose you have a restriction enzyme that has a recognition sequence GCCG. How you would complete the rDNA for a given sequence of one strand as below show in a pictorial view (You need to complete the DNA with a complementary strand before starting the process).
ATAACGATAGCCGTATTATGCAATGCATTACGATTAGCCGTATAAT
(c) Suppose you have a primer sequence GCATGC. In PCR you have a fragment of DNA with 25 spaces for bases which will repeat itself after every six sequences. If the above-mentioned primer fits on the right hand side of your desired DNA strand (lower), show the whole DNA strand before and show the whole picture after elongation process. 3 CO3
3. (a) Do you think we need a protocol to prevent biopiracy? What points do you think we should include in such protocol? Point out briefly. 3 CO3
(b) Can you differentiate between denaturation and extension of PCR in a diagram? Where you can apply PCR? 3 CO3
(c) Suppose you have a relative of age 68 and weight 80 kg with a height of 180 cm. This person has type 1 diabetes. Do you think that person should bring a change in diet? What change (if any) in the food habit should be applied to this relative of yours? 4 CO3
4. (a) Do you think a pandemic can outbreak from environment? Explain it using internal/external elements of ecosystem. 4 CO2
(b) Do you think there is a relation between food and mental diseases? Show this in a diagram. What cautious steps we should take in our daily consumption in this matter? 3 CO2
(c) Explain the differences between resistance and resilience using proper examples. 3 CO2
5. (a) Explain the complications of herd immunity. Show in a diagram how vaccines work. 4 CO2
(b) What are the types of vaccines available to fight against COVID-19? Mention two such vaccines with their doses. 3 CO2
(c) Explain the significance of the lymphatic system in your immune system. 3 CO2

CO1: Define/Justify/Sketch different biological quantities with examples.

CO2: Explain/Show/Discuss the various biological systems.

CO3: Apply the knowledge of biological systems in a real-life problem.