



United International University

School of Science and Engineering

Final Examination; Year 2022; Trimester: Spring

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

Full Marks: 40; Time: 2 hrs

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

1. (a) Name some of the autoimmune diseases. Mention their impact on health. 3 CO1
(b) Name the types of the vaccines used against COVID-19. 2 CO1
(c) Name some of the noncommunicable diseases. What are the ingredients of food that should be taken into account for those diseases? 3 CO1
(d) Why do you put DNA sample in the negative terminal of the device for gel electrophoresis? 1 CO1
(e) Name the goods you would like to protect against biopiracy that is native to Bangladesh (Naming 5 would be sufficient). 1 CO1
2. (a) Do you think you have scope to give your input as a computer engineer in personalized drug design? Give details. 3 CO3
(b) Suppose you have a restriction enzyme that has a recognition sequence GAATTC. 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).
ATATCGAACTTGACATCTGACGATCGACCGGTCGCCGAATTGCATCG
(c) Suppose you have a primer sequence GCATTA. 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 (upper), show the whole DNA strand before and show the whole picture after elongation process. 3 CO3
3. (a) For a drought happening in several years back in the north part of the country explain the resistance and resilience of the ecosystem in a diagram. 4 CO3
(b) Give a pictorial view of similarities and differences of spleen and thymus. 3 CO3
(c) With the help of a diagram show the role of insulin to restore homeostatic control in the blood sugar. 3 CO3
4. (a) Discuss if you think we need a change in diet for a 95 kg 130 cm pregnant woman. Give reasons and possible changes you want to recommend in diet. This person has a gestational diabetes (diabetes in pregnancy period). 5 CO2
(b) For the existing ecosystems on earth explain the basic equations for survival. Do you think chemicals, or sunlight is more significant for the established producer consumer relationships in the existing ecosystem on earth apart for initiation of life? Give reasons behind your answer. 5 CO2
5. (a) Explain the relationship between food and mental stress. Please comment on the steps we should take regarding this matter. 5 CO2
(b) Discuss the significances of having both positive and negative feedback in our homeostasis control. Give proper reasons behind your answers. Do you think there are significances of having both positive and negative feedback in our homeostasis control? Give proper reasons behind your answers. 5 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.