**BIO 3105**

**Proposed Question Bank**

**Summer 2022**

**Biotechnology**

1. Show pictorial view of the pH balance in a bioreactor. Also show how you will maintain necessary air supply. Slide 20
2. Mention the enzymes needed to prepare a DNA sample before pushing it through gel electrophoresis. Slide 14
3. Name the goods you would like to protect against biopiracy that is native to Bangladesh (Naming 5 would be sufficient). Slide (search from google)
4. Do you think you have scope to give your input as a computer engineer in personalized drug design? Give details. Slide 39
5. Show the pictorial view of PCR chain including polarities for DNA. Slide 4, 6
6. Mention the name of the characteristics of a competent host. How you would apply a complete rDNA to a plant (mention only the names of the means you are going to use). Slide 33
7. 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). ATAACGATAGCCGTATTATGCAATGCATTACGAGCCGTATAAT
8. Find the total number of base pairs of sample “A” and “C” from below. Slide 11



1. Show pictorial view of the nutrients supply and temperature control in a bioreactor. Slide 20
2. Do you think we need a protocol to monitor transgenic animal issue? Propose some basic points that you think we should include in the protocol (it should be very brief). Slide (See such protocol from other countries)
3. Do you think you have scope to give your input as a computer engineer in gene therapy for a project? Give details. Slide 37
4. Name the specific fields where you can give your input as a computer engineer. Slide 35-50
5. 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, show the whole DNA strand before and show the whole picture after elongation process.
6. Why do you put DNA sample in the negative terminal of the device for gel electrophoresis? Slide 9-11
7. We would like to cut and then join in the middle of the nucleotide. Enumerate the process
8. Bacteria cell do not accept DNA. Process of DNA acceptation
9. Name the two cores technique soft Biotechlogy.
10. How principle of BT has changed.
11. Early diagnosis is very important is very important , do you have any idea that Bio Technology will help us
12. Is there a way to detect pathogens at initial stages of the disease when their concentrations are low?
13. Differentiate elisa and gel electrophoresis
14. study how genes affect the normal functions of the body and its development

**Ecosystem Dynamics**

1. Give the equations for chemosynthesis and photosynthesis. Which one of these two do you think vital for ecosystems on earth? Give reasons in brief. Slide (see video linked with Slide 15+all Slides)
2. Our environment is comprises of Land, river, ocean, and many . In ecosystem how we can differentiate
3. Impact of environmental disturbance how directly and indirectly effect our health
4. Do you think pandemic can potentially spread out from the ecosystem? Give reasons from the concept of ecosystem dynamics. Slide 25-27
5. Equilibrium, resisitance, resilien, through a example dirrerentiate these
6. Sketch the flow diagram(s) to show the resistance and resilience of a land based ecosystem after deforestation. Slide 24
7. Grazing food web and detrital food web what it is
8. H2S used as a chemical energy of chemoautotropes how the energy to the rest of the ecosystem is done
9. What should be the change in energy flow for a typical ecosystem where there are 3 levels of consumers? Show with the help of energy-time graph. Slide 11, 16
10. Mention the basic differences between food web and food chain. Slide 8-10
11. Mention the names of substances we give up in the environment which can be harmful for us. Slide 20/
12. Name the natural external factors of a land based ecosystem with a brief focus on one example. Slide 23
13. 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. Slide 24 (not direct ans)
14. Explain the results of the simulation with produces and consumers. Slide 14 (simulation)
15. Toxic substances in organisms at each successive trophic level is increased Clarify it

* New: How can we apply the principles of biological systems to address environmental degradation caused by land use changes, river pollution, and ocean acidification, while ensuring the health and sustainability of these vital components of our environment?
* NEW
* How can we apply the knowledge of biological systems to address the issue of pesticide resistance in agricultural pests and ensure sustainable pest management practices?

**Food and Nutrition**

1. Show in pictorial view that how food can help us to fight with noncommunicable diseases (block diagram of key points would be sufficient).
2. Do 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 gestational diabetes (diabetes in pregnancy period).
3. Name the specific ways to control your sugar, salt and fat intake.
4. Suppose you have a child in the family. If from three months the child needs food from outside, how would you plan the diet from three months to one year (only name the foods for specific months).
5. Explain why the increased rate of NCD in our country with examples. Name some of the noncommunicable diseases. Design a lifestyle to prevent those diseases focusing on the ingredients of food that should be taken into account for.
6. Explain the relationship between food and mental stress. Please comment on the steps we should take regarding this matter.
7. Clarify your height and weight complies with BMI. If not then analyse the procedure to maintain.

**Immunity**

1. Write down two of the US based vaccines for COVID-19 with doses.
2. Name the types of the vaccines used against COVID-19.
3. Name some of the autoimmune diseases. Mention their impact on health.
4. Give a pictorial view of similarities and differences of spleen and thymus.
5. With the help of a diagram show the role of insulin to restore homeostatic control in the blood sugar.
6. Discuss the significances of having both positive and negative feedback in our homeostasis control. Give proper reasons behind your answers.
7. Explain each category of Immunity with example. Is Covid 19 vaccine adaptive or innate clarify
8. For example any pathogen is invaded in our body. Justify how your defence mechanisms work in this case.
9. Explain the relationship of vaccination with primary an d secondary response.