QUESTION BANK

MODULE 1

1. Explain the plant and animal cell structure with its functions.
2. What are stem cells? Mention its types and applications.
3. What are carbohydrates? Give its classification.
4. What are Nucleic acids? Write the difference between RNA and DNA.
5. What are Proteins? Mention their types.
6. Briefly explain about Protein functions in our body.
7. What are lipids? Mention their types.
8. Explain the classification of enzymes.
9. Write a short note on Vitamins.
10. Write a short note on Hormone.

MODULE 2

1. Explain cellulose-based water filters with its construction, advantages, disadvantages and its applications.
2. Write a short on PLA and PHA Bio-plastic. (Mention production cycle, applications and advantages).
3. Write a note on DNA vaccine for Rabies virus.
4. Write a note on RNA vaccine for Covid-19.
5. Write a note on protein as food.
6. Explain plant based protein.
7. Briefly explain how lipids behave as cleaning agent/detergent.
8. Explain how enzymes play a role in biosensors fabrication.
9. Write a note on enzymes role in food processing industry.
10. Briefly explain how enzymes act in detergent formulation and textile processing industry.

MODULE 3

1. Explain how Brain works as a CPU system.
2. Write the difference between CNS and PNS.
3. Draw the diagram of Neuron and explain the signal transmission in brain.
4. Write a note on EEG and Robotic arm for prosthetics.
5. What is Parkinson's disease? What are its engineering solutions for the disease?
6. Explain how eye acts as a camera system.
7. Write the difference between photoreceptors rods and cones.
8. What are the optical corrections and mention the lens materials used.
9. Write a note on Cataract and Bionic Eye.
10. Explain how heart works as a pump system.
11. Write a note on ECG and reasons for blockages of blood vessels.
12. What are pacemakers?
13. Write a note on Stents design and Defibrillators.
14. Explain gas exchange mechanism.
15. Write a note on COPD, Ventilators and Heart-Lung Machine.
16. Explain how kidneys work as a filtration system (mechanism of filtration).
17. Write a note on CKD and dialysis system.

MODULE 4

1. Explain how ultrasonography and Sonars behaves as Echolocation.
2. Explain the working principle of bionic eye.
3. How is bird flying mechanism used in aircrafts?
4. Explain how lotus leaf effect property works as super hydrophobic and self-cleaning surfaces.
5. Write a note on Plant Burrs (Velcro).
6. Write a note on Shark skin (Friction reducing swim suits).
7. Write a note on Kingfisher beak (Bullet train).
8. What are HBOCs and PFCs. Mention its applications.

MODULE 5

1. What is muscular dystrophy? Give its bioengineering solutions.
2. What is osteoporosis? Give its bioengineering solutions.
3. What are Bio printing techniques? Write a note on bio-printing materials used.
4. Write a note on 3D printing of Ear, Bone and skin.
5. Briefly explain about 3D printed foods.
6. What is the role of electrical tongue and electrical nose in food science industry?
7. Write a note on DNA origami and Biocomputing.
8. What is the role of Bio-imaging and Artificial Intelligence in medical field of disease diagnosis?
9. Write a note on Self-healing bio-concrete.
10. What is bio-remediation?
11. Explain the role of Bio-mining via microbial surface adsorption.