

Question Bank Pharmaceutical Biotechnology (BP605T)

Unit-I

1. What is Biotechnology, and how is it relevant to Pharmaceutical Sciences?
2. Describe the methods of enzyme immobilization.
3. What are the applications of enzyme biotechnology in the pharmaceutical industry?
4. How do biosensors work, and what are their applications in pharmaceutical industries?
5. Provide a brief introduction to protein engineering.
6. What is the role of microbes in industry?
7. What are the general considerations for the production of enzymes such as amylase and catalase?
8. What are the general considerations for the production of enzymes like peroxidase, lipase, protease, and penicillinase?
9. What are the basic principles of genetic engineering?
10. How are genetically engineered microorganisms used in the production of therapeutic enzymes and antibiotics?

Unit-II

1. What are cloning vectors, and why are they important in recombinant DNA technology?
2. Explain the role of restriction endonucleases in genetic engineering.
3. What is the function of DNA ligase in recombinant DNA technology?
4. Describe the process of recombinant DNA technology.
5. How is genetic engineering applied in medicine?

6. What is the role of recombinant DNA technology in the production of interferon?
7. How is recombinant DNA technology used in the production of hepatitis-B vaccines?
8. Explain how genetic engineering is used in the production of insulin.
9. What are the key steps involved in the production of hormones using recombinant DNA technology?
10. Provide a brief introduction to Polymerase Chain Reaction (PCR) and its significance in genetic research.

Unit-III

1. What is the structure of immunoglobulins, and how does it relate to their function in immunity?
2. Explain the structure and function of Major Histocompatibility Complex (MHC) molecules.
3. What are the different types of hypersensitivity reactions, and how do they affect the immune system?
4. Discuss the mechanisms of immune stimulation and immune suppression.
5. Describe the general methods of preparing bacterial vaccines, toxoids, and viral vaccines.
6. How are antitoxins, serum-immune blood derivatives, and other immune products prepared and used in immunity?
7. What are the proper storage conditions and stability requirements for official vaccines?
8. What is hybridoma technology, and how is it used in the production and purification of monoclonal antibodies?
9. Discuss the applications of hybridoma technology in medicine and biotechnology.
10. What are blood products and plasma substitutes, and how are they used in medical treatments?

Unit-IV

1. What are the key principles of the ELISA technique, and how is it used in immunoassays?
2. Describe the process and applications of Western blotting in detecting specific proteins.
3. How does Southern blotting work, and what is its use in detecting specific DNA sequences?
4. Explain the genetic organization of eukaryotes and prokaryotes, highlighting key differences.
5. What are the mechanisms of microbial genetics including transformation, transduction, and conjugation?
6. Discuss the roles of plasmids and transposons in microbial genetics.
7. What is microbial biotransformation, and how is it applied in the pharmaceutical and biotechnology industries?
8. What are the different types of mutations and how do they lead to the formation of mutants?
9. How does transformation occur in bacteria, and what are its practical applications?
10. Describe the process of transduction and its significance in microbial genetics.

Unit-v

1. What are the general requirements and steps involved in fermentation methods?
2. How are media formulated for fermentation processes, and what factors influence their composition?
3. What are the different types of equipment used in fermentation, and what is their role in the process?
4. Explain the various sterilization methods used in fermentation to prevent contamination.
5. How does aeration and stirring impact the fermentation process, and why are they important?
6. Describe the design features of large-scale production fermenters and the types of controls they incorporate.
7. How is penicillin produced through fermentation, and what are the key factors that affect its yield?
8. Discuss the process of citric acid production through fermentation and its industrial applications.
9. What are the steps involved in the production of Vitamin B12 and glutamic acid via fermentation?

10. Explain the collection, processing, and storage procedures for whole human blood, dried human plasma, and plasma substitutes.