MARINE BIOINFORMATICS & NANOBIOTECHNOLOGY - PBBT305

UNIT-1 MARINE GENOMICS AND PROTEOMICS

PART-A (2 Marks)

1. Define genomics?
2. Scope and functional genomics?
3. What is Genetics?
4. Define functional genomics?
5. What does the field of proteomics study?
6. What is comparative genomics?
7. What are the functions of the genes?
8. What is expression proteomics?
9. Why the proteome larger than the genome?
10. What is IPRs?
11. Define gene ontology
12. What is proteomics?
13. What is gene?
14. Difference between DNA & RNA?
15. What are biomolecules
16. What is bioinformatics?
17. What is patent?
18. Difference between innovation and invention.
19. Define copyrights.
20. Why we maintain the trade secrets?

PART-B (5 Marks)

1. What are the applications of functional genomics?

2. Write a short note on molecular biology and its application?
3. Explain the intellectual property rights of marine genomic resources?
4. Write comments on Proteomics Methodology and its application?
5. Write short note on bioinformatics and functional genomic?
6. Explain detailed the world intellectual property organization.
7. What is the significance of patents in India?
8. Explain detail about relatioships between Gene and protein
9. Define DNA Chips. Discuss the application of DNA microarray.
10. Importance of expressed sequence Tag (EST) Approach.

PART-C (10 Marks)

1. Discuss about detailed General of tariffs and (GATT) and Trade Related IPRs (TRIPs)
2. Determine the biosafety guidelines and regulations.
3. Write an essay an operation of IPR guidelines in India.
4. What is intellectual property right? Discuss in detail the different forms of its protection.
5. Write an essay on patenting the marine organisms?
6. What is genomics? Discuss in detail the types of genomics.
7. What is proteomics? Write different types of proteomics?
8. What is expression tag sequence? How it is prepared?
9. Give an illustrated account of DNA microarray technology.
10. Write short note on the following SNPs, functional genomics, DNA microarray technology.

UNIT - 2 TOOLS AND TECHNIQUES IN BIOINFORMATICS

PART-A (2 Marks)

1. What are the bioinformatics tools?
2. What is bioinformatics?
3. Why bioinformatics is important?
4. List out the scope of bioinformatics?
5. What is database?
6. Define genomic DNA.

7. Define cDNA
8. Why bioinformatics is necessary?
9. Explain the scope of bioinformatics?
10. Explain in details on applications of bioinformatics?
11. Explain Gene maping?
12. What is a primary database?
13. Define phylogenetic tree.
14. What is homologus sequence?
15. Explain data mining?
16. What is biological bibliography database?
17. Define BLAST.
18. Define FASTA.
19. What is CATH?
20. Define genome Database.

PART-B (5 Marks)

1. What are tools and techniques used bioinformatics?
2. Provide the list of bioinformatics software and its applications?
3. Provide list of biological databases?
4. What are the applications of bioinformatics in various fields.
5. What are the information sources used in bioinformatics.
6. Write about anyone commercial gene identification tool.
7. Write short note on gene expression and microarray.
8. Write about structural classification of protein.
9. Discuss the importance of structural biology in drug discovery.
10. Define G-protein coupled receptor.

PART-C (10 Marks)

1. Give a historical account of bioinformatics.
2. List any six resources available from NCBI and their uses.

3. Write the method of nomenclature of protein and DNA sequences.
4. Briefly discuss about the importance of business management in bioinformatics
5. Write about multiple sequence alignment and phylogenetic tree?
6. Write about profiles and Hidden Markov Model
7. Discuss anyone of protein secondary structure and prediction methods.
8. Describe how Bioinformatics works in the field of medicinal informatics sector
9. Provide brief details on problems in molecular biology approach and how it can be solve by bioinformatics method.
10. Explain about peptide bond in protein structure.

UNIT-3 MARINE BIOINFORMATICS AND DRUG DELIVERY

PART-A (2 Marks)

1. What is homology modeling?
2. What is SCOPE?
3. What is EMBL?
4. Define pairwise alignment?
5. What is annotation?
6. What are the sequence motifs? Give an example.
7. What is meant by protein folding?
8. Differentiate analogue and homologous.
9. Define SWISSPROT
10. Define proteomics.
11. What is Gene bank?
12. Use of Phylogenetic tree?
13. Define similarity index in bioinformatics
14. Write the term of homologous sequence.
15. What is cap and uncap alignment?
16. List out primary database used in bioinformatics.
17. List out secondary database used in bioinformatics..
18. What are the roles of bioinformatics in drug delivery?
19. What are the applications of bioinformatics?
20. What are the types of biological information?

PART-B (5 Marks)

1) Give full account of gene prediction methods.
2) What is bioinformatics? Give its application in various fields.
3) FASTA tool is used for global alignment. Justify
4) Write an importance of genome databases in bioinformatics data management.
5) What is bioinformatics? Explain primary sequence database.
6) Justify BLAST is tool for homology searching.
7) Write about the impact of drug discovery process in business management
8) Explain purification and characterization of protein structure.
9) Explain about drug discovery and development process using timeline chart.
10) Write short notes on primary and secondary databases.

PART-C (10 Marks)

1) Why protein structure prediction is important? Give full account structure prediction using computational methods.
2) What is homology modeling? Explain its use in protein structure prediction.
3) Write detail account of full genome comparison.
4) Briefly explain about the emerging role in biomarkers in drug discovery.
5) Explain about the computer aided drug design.
6) Explain briefly about role of bioinformatics in drug development
7) Describe how bioinformatics works in the field of medicinal informatics sector.
8) Classify and explain major databases in bioinformatics giving examples of each database?
9) Write detail account of application of bioinformatics in pharmaceutical industries
10) Define Bioinformatics? Explain bioinformatics application related to the following areas.

UNIT-4 RECENT ADVANCES IN MARINE BIOINFORMATICS

PART-A (2 Marks)

1. What is marine bioinformatics?
2. Need and uses of marine bioinformatics?
3. What is marine genomics?

4. Define DNA micro array?
5. What is ESTs?
6. What is the expansion of PCR?
7. What is primer?
8. What is metagenomics?
9. Explain multiple sequence alignment?
10. Explain local sequence alignment?
11. What is homology modeling?
12. Name the two or three developed tools used in bioinformatic application?
13. What are the sequence motifs? Give an example.
14. What is meant by protein folding?
15. What is comparative genomics?
16. What are the functions of the genes?
17. Explain algorithm used in bioinformatics techniques?
18. What is annealing?
19. Define denaturation
20. Explain the use of MEGA Tool

PART-B (5 Marks)

1. Explain about International initiatives on marine bioinformatics?
2. Write short notes on Indian initiatives on marine bioinformatics.
3. Give an account on bioinformatics tools used in marine drug discovery.
4. Explain about the use of metagenomics study?
5. Give full account of gene prediction methods.
6. Give an account on DNA fingerprinting
7. FASTA tool is used for global alignment. Justify
8. Write an importance of gene mapping
9. Explain in details on Human genome project
10. Write short notes on environmental applications of marine bioinformatics.

PART-C (10 Marks)

1. Explain about recent advances in marine bioinformatics?
2. Write essay on environmental application of marine bioinformatics.
3. Classify the newly developed tools and techniques in marine bioinformatics.
4. Write brief note on gene mapping on human genome project
5. Describe how Bioinformatics works in the field of medicinal informatics sector
6. Explain about the problem in molecular biology approach and how it is solved in bioinformatics method.
7. What are tools and techniques used bioinformatics and describe its application?
8. What is homology modeling? Explain its use in protein structure prediction.
9. Explain about peptide bond in protein structure.
10. Describe the international and national initiatives on marine bioinformatics.

UNIT-5 NANOBIOTECHNOLOGY

PART-A (2 Marks)

1. Define nano biotechnology
2. Define nanocomposite.
3. What is extracellular synthesis of nanoparticles?
4. What is AFM?
5. Differentiate between SEM and TEM?
6. Define quantum dots.
7. What are the biogenic nanoparticles
8. Role of fungi in nanoparticles synthesis
9. What is nanoalloy?
10. What is the expansion of UPES?
11. Name one nanoparticle used for antibacterial application?
12. What is nanosensor?
13. What is SPR in UV –visible studies of nanomaterials?

14. What is C_{60}?
15. Explain carbon nanotube?
16. What are the element present fullerene?
17. Define Nonmaterial
18. Define nanowire
19. What is nano?
20. Provide some example of nanomaetrials

PART-B (5 Marks)

1. Define nanocomposite and classify nanocomposites?
2. Give some present and future application of nanomaterials?
3. List out the advantage and disadvantage of nanoparticles.
4. Define carbon nanotube? Describe types of carbon nanotube?
5. Short note on future scenario of Nano medicine?
6. Explain the synthesis and purification methods for carbon nanotube.
7. Write short essay on use of nanoparticles in cancer therapy?
8. Explain toxicology of nanoparticles?
9. Explain the uses of TEM and SEM in the study of Nano systems.
10. What make nanoparticles suitable for nasal administration?

PART-C (10 Marks)

1. Discuss about targeted drug delivery using nanoparticles?
2. What are functionalized metal nanoparticles? Describe the advantages of functionalized metal nanoparticles.
3. Explain the filling of nanotubes and also the mechanism of growth of carbon nanotube.
4. Write in detail about physical, chemical, Electrical, mechanical properties of nanoparticles?
5. Explain in detail mechanisms of silver nanoparticle biosynthesis?
6. Write short notes on application of silver nanoparticles and uses of MRI.
7. Explain process design for industrial scale synthesis of nanoparticles.
8. Explain methods used for the synthesis of nanoparticles.
9. Explain application of metal nanoparticles.
10. Write a note on the ethical and commercial aspects of nanotechnology.