

Punyashlok Ahilyadevi Holkar Solapur University, Solapur

M.Sc-II (Bioinformatics) (Semester-IV) (New CBCS)

HCT 4.2 CLINICAL BIOINFORMATICS

Question Bank 2022

Q.2. Answer the following.

16M(4x4)

1. Write a note on types of clinical research.
2. Give a note on the *A.thaliana* genome sequence project and its applications.
3. What are the symptoms of viral diseases?
4. How is pharmacogenomics necessary for drug designing?
5. Give a detailed note on International Council for Harmonization guidelines.
6. Write a note on pharmacological classes of drugs.
7. Explain the comparative genome analysis with an example.
8. How to design CRF in clinical research?
9. Write a note on clinical record form designing in clinical research?
10. Give a note on the Human genome sequence project and applications.
11. What are the symptoms of respiratory diseases?
12. Explain the therapeutic and gene based pharmacological targets.
13. Write a note on the need for QC in NGS.
14. Give a note on the sign and symptoms of parasitic disease.
15. Give an explanation of the steps of performing reference based assembly.
16. Enlist the ethical challenges in applying pharmacogenomics in drug discovery.
17. Write Antibodies and RNAs based drug designing in detail.
18. Explain any bacterial genome project in detail.
19. Give a list of in silico tools for the prediction of host pathogen interactions.
20. Write the available treatments for viral disease.

Q.3. Answer the following.

16M (8+8)

1. Write in detail of Next generation sequencing platforms.
2. Explain the clinical data management and its software.
3. Explain the computational study of host pathogen interactions in detail.
4. Give a detailed account of file formats in NGS data analysis.
5. Write in detail of Next generation sequencing FASTQC results.
6. Explain the clinical research phases and overview of clinical research.
7. Give a detailed account of epigenomics and its applications.
8. Explain FASTQC and HTQC tools in next generation sequencing.
9. Explain the brief steps of visualization of genome data in Ensemble.
10. Give the detailed steps for the identification of medical codes for disease.

Q.4. Answer the following.**16M(8+8)**

1. Give a detailed account of Ensembl and Map viewer database.
2. Give a detailed account of Pathology informatics and tools for analysis of pathology informatics.
3. Explain pharmacogenomics and its applications in drug design.
4. Give a detailed account of the Human genome project with its ELSI.
5. Give a detailed account of Host pathogen interaction and tool or database for host pathogen interactions.
6. Give a detailed account of Pathology informatics and tools for analysis of pathology informatics.
7. Give a detailed account of the *C. elegans* genome project with its genome data.
8. Enlist the social issues of the human genome project.
9. Explain the basic concepts of understanding genetic disease.
10. Give detailed signs and symptoms of Alzheimer's and Parkinson's disease.

Q.5. Answer the following**16M(8+8)**

1. What is a circulatory disease? And available treatment for circulatory disease.
2. Give a detailed note on metabolomics analytic technology.
3. Explain the causes and available treatment for neurodegenerative disease.
4. Give detailed steps of the map viewer database.
5. What ICH and guidelines for good clinical practices in clinical research?
6. Give a detailed note on Genome assembly and its types.
7. Explain the need for pathology informatics in the laboratory.
8. Give a detailed note on the basics of next generation sequencing chemistry.
9. Give a detailed note on transcriptomics data analysis.
10. How the Microarray study in NGS data analysis.

Q.6. Answer the following.**16M(8+8)**

1. Explain the genome assembly and types of genome assembly in detail.
2. What is an international classification of disease? and its type in medical coding.
3. What is medical coding? Add a note on the steps of medical coding.
4. Write a note on genetic disorders and the available treatment for genetic diseases.
5. Explain the RNA sequence analysis and its application in transcriptomics and microarray data analysis.
6. What is the role of medical coding in the healthcare domain?
7. What are the bioinformatics challenges for NGS data analysis?
8. Explain the bacterial and viral pathogen database in detail.
9. Give a detailed account of Cancer and its application to the study in bioinformatics.
10. Give a detailed note on adverse drug reactions.

Q.7. Answer the following.**16M(8+8)**

1. Explain types of interaction and give the details of the database for host pathogen interactions.
2. Write a goal of the Human Genome Project and its ELSI in implications on human disease.
3. Give a detailed account of medical bioinformatics.
4. Write a note on guidelines for good clinical practices.
5. Explain the International classification of disease and give the details of pharmacovigilance.
6. Write a note on *A. thaliana* Genome project and its applications in detail.
7. Give a detailed account of Illumina and Roche 454 sequencing platforms.
8. Write a note on NGS methods in clinical bioinformatics with examples.
9. Explain the Chip seq and RNA seq data analysis.
10. Write a note on metabolomics with its applications in bioinformatics in detail.

Punyashlok Ahilyadevi Holkar Solapur University, Solapur
Faculty of Science & Technology
M. Sc. Part- I, Sem-IV Bioinformatics(New CBCS)
Paper: HCT4.3 Research Methodology and Intellectual Property Rights
Question Bank 2022

Q.2. Answer the following

16 (4X4)

1. Write a note on the importance and meaning of research.
2. Explain the objectives of research
3. Explain the steps in research
4. Explain the detail about the literature review.
5. Describe types of ANOVA.
6. Describe the correlation coefficient
7. Write a note on advantages and limitations of sampling.
8. Explain the collection of data methods
9. Briefly explain the concept of plagiarism
10. Describe the terms impact factor, journal indexing, h-index and i10 index
11. Explain the detailed guidelines for writing an introduction in the manuscript.
12. Write a note on the preparation of the oral presentation
13. Write a note on Poster Presentation for conferences
14. Explain the mission and goals of WIPO
15. Describe non-patentable materials
16. Write a note on intellectual property infringement
17. Describe the mission of UPOV
18. Write a note on requirements for the protection of new varieties of plants
19. Briefly explain the advantages and disadvantages of plant breeder's right
20. Explain the trademark and trade secrets

Q.3. Answer the following

16 (8+8)

1. Explain in detail the characteristics of the research
2. Write a detailed description of research design
3. Describe the types of sampling in detail
4. Explain in detail the data collection methods
5. Describe the different guidelines for writing abstracts for research manuscripts.
6. Explain the author's instructions from the Indian Journal of Biotechnology for preparing the manuscript.
7. Explain in detail the patent procedure in India
8. Explain different forms of protection of intellectual property
9. Explain the conditions for obtaining protection for the new plant variety.
10. Explain the methods of technology transfer.

Q.4. Answer the following**16 (8+8)**

1. Explain in detail the fundamental and applied research
2. Explain the key steps to writing a literature review
3. Write a note on the advantages and limitations of sampling
4. Write a note on the difference between primary and secondary data
5. Scientific proposal writing for UGC funding agency
6. Explain the use of audio-visual aids in Presentation
7. Describe in detail geographical indication (GI) and mention eight GI tags in India.
8. Write a note on the intellectual property law
9. Write a note on the plant breeder's rights
10. Write a note on breeder's exemption and farmer's privilege

Q.5. Answer the following**16 (8+8)**

1. Write a note on different hypotheses.
2. Explain in detail the types of research.
3. Describe sampling theory in detail and add a note on the difference between population and sample.
4. Describe the Chi-square test of independence and goodness of fit.
5. Explain in detail the oral and poster presentation.
6. Explain in detail the guidelines for writing a bibliography
7. Write a note on patent search databases
8. Discuss in detail the patent case study with respect to Neem and Turmeric.
9. Explain the requirements of material for DUS testing.
10. Why protect new plant variety? How are new plant varieties benefit society?

Q.6. Answer the following**16 (8+8)**

1. Explain the components of the research problem.
2. Explain the body of the research report.
3. What is data? Describe in detail the primary data collection methods.
4. What is the degrees of freedom? Explain Chi-square test with an example.
5. What is a research publication? Add a note on the criteria for publication.
6. Write a note on search engines used for retrieval of the literature.
7. Briefly explain the Criteria for patenting.
8. Write a note on different types of works protected by copyright in India.
9. Write a note on the technology transfer with its benefits.
10. Why do farmers and growers need new plant varieties?

Q.7. Answer the following.

16 (8+8)

1. What is a hypothesis? Explain how hypothesis helps in the scientific method.
2. What is the importance of research? Explain in detail the types of research.
3. Briefly explain the testing of significance of mean, proportion, variance and correlation.
4. Describe the common challenges in data collection.
5. Write a note on ISSN and ISBN.
6. Explain the guidelines for writing the materials and methods section of thesis.
7. Explain the steps involved in PCT application for international patent.
8. Discuss in detail the patent case study with respect to Basmati.
9. Describe the plant variety protection and the TRIPS agreement.
10. Write a note on technology transfer process.

Punyashlok Ahilyadevi Holkar Solapur University, Solapur
Faculty of Science & Technology
M.Sc.II Bioinformatics Sem –IV(New CBCSPattern)
Theory Examination April/May 2022
SCT 4.1 Emerging Areas of Bioinformatics

Question Bank 2022

Q.2. Answer the following. -

16M (4x4)

- 1.Explain the SDF file format in detail.
- 2.Write a note on dbSNP database and submission details.
- 3.Write a note on Molecular data types in Molecular phylogenetics.
- 4.Write a note on importance of immunoinformatics.
- 5.Explain the SMILE file format in detail.
- 6.Write a note on application of SNPs in personalized medicine.
- 7.Write basic principle of Molecular phylogenetics.
- 8.Add a note on reverse vaccinology.
- 9.Explain the MDL Mol file format in detail.
- 10.Write a note on dbSNP database and submission.
- 11.Write a note on types of Biodiversity.
- 12.Write a note on application of informatics in immunology.
- 13.Why is high-throughput screening important?
- 14.Explain the 3D representation of molecule.
- 15.What is micro and macro taxonomy?
- 16.Explain virtual library in chemoinformatics.
17. Write a note on importance MHC I and II molecules.
18. Add a note on functions of immune system.
- 19.Write a note on significance of informatics in immunology.
20. Add a note on historical aspects of immunoinformatics.

Q.3. Answer the following.

16M

1. Write in detail Pubchem and Drugbank chemical database.
2. Give a detail account Substructure based searching.
3. Write ZINC and chembank chemical database in detail.
4. Give a detail account analysis of HTS chemical data.
5. Write in detail chemical database and searching types.
6. Give a detail account on Substructure based searching.
7. Write a note on Integrated taxonomic information system.
8. Add a detailed note on *in-silico* vaccine designing.
9. Write a detailed note on databases for epitope prediction.
10. Add a note on properties and applications of nanoparticles.

Q.4. Answer the following.

16M

1. What is polymorphism? How to take clinical decision for personalized medicine?
2. Define IMGT. Add a note on its databases.
3. What is Personalized medicine and types of Polymorphisms?
4. Define IEDB. Add a note on its applications.
5. Define Chemoinformatics. How to perform virtual screening in drug designing?

6. Define Epitope. Add a note on databases and tools for its prediction.
7. Give a detail note on herbarium with BRIT database.
8. Give a detailed note on NGS applications in personalized medicine.
9. Add a note on different methods of analysis of nanoparticles.
10. Write a note on types of immunomic databases.

Q.5. Answer the following.

16M

1. Write a detail account on botanical library and systematic database.
2. Add a note on methods of synthesis of nanoparticles.
3. Write a detail account on Species 2000 and searching criteria in database.
4. Explain the biological synthesis of nanoparticles.
5. Write a detail account on molecular taxonomy and molecular phylogenetics.
6. Define nanoinformatics. Add a note on types of nanoparticles with applications.
7. Explain steps of phylogenetic tree construction in bioinformatics with examples.
8. Give a list of gene testing for support in personalized medicine.
9. Add a note on challenges of bioinformatics in nanotechnology.
10. Write a note on applications of nanomedicine with examples.

Q.6. Answer the following.

16M

1. Give a detail account on Chemoinformatics and applications in different fields.
2. Write a detailed note on applications of immunoinformatics.
3. Explain the Global patterns of distribution of biodiversity, application of biodiversity informatics.
4. Add a note on immunoinformatics databases with examples.
5. Give a detailed account Botanical Library BRIT and BGBM database with its standards.
6. What is immunoinformatics? Add a note on databases of it.
7. Explain the prediction of structural gene changes in polymorphism and influences in disease.
8. Write a note on prediction of T and B cell epitopes.
9. Add a note on applications of IEDB and Epitome databases.
10. Add a note on various resources and tools of IMGT.

Q.7. Answer the following.

16M

1. Give a detailed account modern taxonomical methods with examples.
2. Explain the Genetic testing with applications in personalized medicine.
3. Write a detailed account on Species and genetic biodiversity with types of biodiversity.
4. Explain the standards and protocols in taxonomic database working group.
5. Write in detail Species 2000 and GBIF database with its standard and protocols.
6. Explain the single nucleotide polymorphism with applications in personalized medicine.
7. Give a detailed note on challenges of personalized medicine in clinical decision support.
8. Add a detailed note on applications of nanoparticles.
9. Explain the biological synthesis of nanoparticles with applications.
10. Add a note on principle and procedure of reverse vaccinology.