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End Semester Examinations - Nov-Dec 2015 Exams

14BI2001 Analytical Bioinformatics

Set B

Time : 3 hrs
Total Marks: 100

1. a) Discuss in detail about the need for biological databases. (5)

   b) Explain about the characteristics and different categories of bioinformatics databases. (15)

OR

2. Give a detailed account on EMBL database. Discuss in detail about EMBL entry format and information retrieval system of EMBL database. (20)

3. A)What is the significance of Ramachandran plot. (5)

   B)Explain how Ramachandran plot is used to evaluate a protein structure with Illustration. (15)

OR

4. Depict in detail various levels of protein molecule. (20)

5. Align the following Sequences using Needleman - Wunch- Algorithm

   Sequence 1 :G C A C A T T C A

   Sequence 2 : G C GT A T C A

   Scores : Match= 1; Mismatch = -2 ; Gap= -1

OR

6. Write a short note on Dynamic Programming. (7)

   Explain the working of any one Sequence Alignment Tool. (13)

7. Illustrate and explain about any three styles of phylogenetic trees with examples. (15)

   Write a short note on Scaled and Unscaled phylogenetic trees. (5)

OR

8. Explain the working of Newick format with a suitable example. (13)

   Write a short note on rooted and unrooted trees. (7)

9. Discuss in detail purpose of Gene Prediction. Explain the various process and methodologies used for finding Genes. (20)

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End Semester Examinations - Nov-Dec 2015 Exams

14BI2002 Instrumental Methods of Analysis

Set A

Time : 3 hrs
Total Marks: 100

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1. Derive Henderson – Hesselbalch equation and state its applications in the field of biological sciences

OR

2. Write in detail the working principle, instrumentation and application of pH meter with a neat diagram

3. State Beer's Law. Explain in detail the instrumentation, working principle and applications of dual beam UV-Visible spectrophotometer with a neat diagram

OR

4. Write in detail the principle, instrumentation and applications of Raman spectroscopy with a neat diagram

5. Explain in detail the instrumentation, working principle of HPLC and its applications with a neat diagram

OR

6. Define electrophoresis. Briefly describe the working principle, procedure and applications of Isoelectric focussing with suitable diagram

7. Give a detailed account on scintillation counters and mention its applications in detection of radioactive isotopes

OR

8. Write the different applications of radioactive metals in medicine and diagnosis with suitable examples

9. What is thermal analysis? Briefly explain about the process of differential thermal analysis and its applications

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End Semester Examinations - Nov-Dec 2015 Exams

14BI2003 Molecular Biology and Genetic Engineering

Set B

Time : 3 hrs
Total Marks: 100

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1. Describe the series of experiments conducted in 1952 that proved DNA to be the genetic material.

OR

2. Describe the types of mutation that can occur in genes and which mutations can be deleterious.

3. Describe the following: A. D- loop mode of replication B. Rolling circle mode of replication

OR

4. Discuss post-transcriptional changes occurring inside a cell.

5. Explain how Tryptophan is produced through operons

OR

6. Write notes on the types of vectors used for cloning genes

7. Describe the method used for detection of a specific DNA sequence in DNA samples.

OR

8. Depict the construction of a cDNA library.

9. What are restriction enzymes? Discuss the types and uses of these enzymes in rDNA technology.

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End Semester Examinations - Nov-Dec 2015 Exams

14BI2004 Genomics and Proteomics

Set A

Time : 3 hrs
Total Marks: 100

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1. Explain how are eukaryotic genomes organized?

OR

2. Explain how a restriction map is constructed with an example

3. Describe the methods to identify functions of new genes

OR

4. Give detailed notes on the Human Genome Project

5. Discuss how Sanger's method of sequencing is performed

OR

6. How does 2D-PAGE work? Describe in detail the 2 dimensions used

7. Discuss how Peptide Mass Fingerprinting is carried out. How is it important in Proteomics?

OR

8. Design a microarray experiment and describe its workflow

9. Describe how MALDI- TOF works

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End Semester Examinations - Nov-Dec 2015 Exams

14BI2005 Structural Biology and Biophysical Techniques

Set B

Time : 3 hrs
Total Marks: 100

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1. a. Explain in detail the hierarchy of protein structure. (17 Marks)

   b. Give a short note on dihedral angles. (3 Marks)

OR

2. a. Tabulate the difference between Watson & Crick and Hoogsteen DNA structure. (2 Marks)

   b. Write an elaborate note on the types of RNA. (18 Marks)

3. a. What are polysaccharides? Describe with its types. (18 Marks)

   b. Draw the Fischer and Haworth projections. (2 Marks)

OR

4. a. What are lipid rafts? Mention its types. (3 Marks)

   b. Discuss on the importance of glycoconjugates in the architecture of biological membranes. (17 Marks)

5. a. Describe the working principle, instrumentation and steps involved in X-ray crystallography. (15 Marks)

   b. What are the types of X-ray diffraction? (5 Marks)

OR

6. a. Explain with a neat sketch about the various ultracentrifugation techniques. (16 Marks)

   b. Write a brief description on SANS. (4 Marks)

7. a. Mention the various scattering techniques used to determine the macromolecules size, shape and structure. (18 Marks)

   b. What is CW-NMR and FT-NMR? (2 Marks)

OR

8. a. Mention any five protein structure prediction tools. (5 Marks)

   b. Discuss on the history of biological membrane. (15 Marks)

9. Write in detain about the RNA tertiary structures. (20 Marks)

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End Semester Examinations - Nov-Dec 2015 Exams

14BI2006 PERL and PYTHON Programming

Set B

Time : 3 hrs
Total Marks: 100

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1. Explain the built in objects in python. (20)

OR

2. Discuss in detail about the various condition and control structure in PERL. (20)

3. **How do you open a file for reading, writing and appending in PERL? Explain with the suitable example. (20)**

OR

4. **Why python do not have declaration statement or a specific datatype. Explain with example. (20)**

5. Discuss about built in data types in python. (20)

OR

6. **Explain in detail about the array and hashes used in PERL.(20)**

7. What is globing? What is the use of globing in PERL? Explain with example. (20)

OR

8. Write PERL statements using regular expressions for the following: (20)

   i. Matches any of these words in the string: cat, rat, mat
   ii. Matches the date format dd -mm- yyyy
   iii. Count the number of times the word "the" occurs in the given text.
   iv. Occurrence of digit 5 for 3 or more times
   v. Substitute lower case with upper case
   vi. Splitting paragraph into sentences

9. Define different steps in designing of a class and its instances. (20)

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End Semester Examinations - Nov-Dec 2015 Exams

14BI2008 Molecular Modeling and CADD

Set B

Time : 3 hrs
Total Marks: 100

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1. Define force field? Explain the principle empricacal force field models in molecular mechanics. (20 marks)

OR

2. Discuss and breife the principle and application of molecular modelling in biological theory science. (20 marks)

3. Define protein energy minimisation? Write a complete note on Derivative and non-derivative energy minimisation methods and algorithm. (20 marks)

OR

4. Briefly describe the principle and mechanism of second order derivative methods of protein structural minimisation. (20 marks)

5. Write a detail note on Quasi newton and quasi Raphson methods and application of minimisation. (20 marks)

OR

6. Write a detail note on molecular formats how can 2D structure can be converted into 3D (20 marks)

7. A.What is Drug? Explain in detail about insilico prediction of ADMET properties. (10 marks)

   B.Explain briefly about various biomolecular visualisation and structural analysis tools and mechanism. (10 marks)

OR

8. Explain QSAR and QSPR. Discuss a detail note on conformational molecular field analysis and application of QSAR. (20 marks)

9. Define protein Docking? Briefly describe the methods and application of molecular docking and scoring systems. (20 marks)

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End Semester Examinations - Nov-Dec 2015 Exams

14BI2021 Pharmacogenomics

Set B **Time : 3 hrs**
Total Marks: 100

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1. a. Mention the role of SNP's into useful markers of drug response. (7)

   b. Describe the understanding of pharmacokinetics and pharmacodynamics in relation to drug activity. (13)

OR

2. Justify the role of pharmacogenomics in regard to alcoholism and explain any one drug activity. (20)

3. Explain the role of genomics application in drug response and its toxicity level. (20)

OR

4. Write in detail about different types of drug transporters used for the drug delivery system. (20)

5. Explain the importance of glycoproteins in biomedicine and health sector. (20)

OR

6. Illustrate the effect of pharmacogenomics for neurological diseases and description about any drugs and its targets prescribed for it. (20)

7. Pen down the steps involved in any drug discovery with approximate time frame. (20)

OR

8. Describe in detail about the human genome structure and its organization. (20)

9. Mention the role of pharmacogenomics in drug discovery and its development. (20)

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14BI2032 Health Care Informatics

Set B

Time : 3 hrs
Total Marks: 100

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1. Define the term Medical Informatics and discuss how the field evolved

OR

2. Mention the pre-requisites to create a HMIS. Describe atleast one HMIS

3. Discuss the application of Artificial Intelligence to create Knowledge based expert systems in Health care

OR

4. Examine the need and requirements for Telemedicine in India

5. Confer your views on using robots to conduct surgical procedures with examples

OR

6. Describe how Virtual Endoscopy is achieved, mentioning few of its applications

7. Discuss about the topic “Telesurgery- Is it a necessity?”

OR

8. List the types of medical equipments required in a hospital and describe atleast 6 of them

9. Describe the creation and maintenance of a Electronic Medical Record

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End Semester Examinations - Nov-Dec 2015 Exams

15BI3002 Computational Genome and Proteome Analysis

Set A

Time : 3 hrs
Total Marks: 100

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1. Compare DDBJ, GenBank and EMBL nucleotide databases. Specify the important features present in each database. (10+10=20)

OR

2. Comment on the importance of DNA sequencing for advancement in biology. Explain Sanger's DNA sequencing method using suitable diagrams. (10+10=20)

3. What is genome assembly? Explain about any one of the algorithms used by assemblers. (8+12=20)

OR

4. What is meant by the word "Annotation"? Explain Genome Annotation in detail. (2+18=20)

5. Explain in detail about Ensembl and Mapviewer. (10+10=20)

OR

6. How did Human genome project lead to new "Spinoffs"? What is the role of Human Genome Project in basic science research and drug development? (8+6+6=20)

7. Explain Needleman-Wunsch Algorithm? Calculate the alignment score between two sequences giving a penalty of -2 for a gap, -3 for mismatch and 2 for match.

   Seq1=GTCACG and Seq2=GTGCCG (5+15=20)

OR

8. What do you understand by comparative genomics? Explain its significance in biological sciences? Justify using an example. (4+10+6=20)

9. Explain in detail about 2D PAGE and 2D-DIGE. Briefly mention image analysis using Melanie. (7+7+6=20)

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End Semester Examinations - Nov-Dec 2015 Exams

15BI3004 Cheminformatics and QSAR

Set B

Time : 3 hrs
Total Marks: 100

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1. A. Give an overview of application of cheminformatics in various fields. (10 marks)

   B. Describe about the various Prospects of cheminformatics. (10 marks)

OR

2. A. Explain briefly about experimental methods used for molecular structure elucidation. (10 marks)

   B. Write a complete note on Computational molecular structure prediction. (10 marks)

3. A. Briefly describe the reaction mechanism of inductive effect and electrometric effect. (10 marks)

   B. Write a complete note on following

      Resonance (5 marks)

      Hyper conjugation (5 marks)

OR

4. A. Explain various reaction mechanism of chemical reaction (10 marks)

   B. Classify basic chemical reaction scheme with example (10 marks)

5. Define 3DQSAR? Elaborate the basic principle of QSAR modelling in chemical molecules. (20 marks)

OR

6. Briefly describe the statistical tools routinely required in QSAR methodologies. (20 marks)

7. A. Write an overview of mechanism behind to encompass 2D structure to 3D geometry. (10 marks)

   B. Briefly describe the pharmacophore QSAR modelling. (10 marks)

OR

8. Briefly describe the CADD methods and optimisation are followed in pharmaceutical industries.(20 marks)

9. Explain in molecular optimisation methods used in QSAR with example. (10 marks)

   Explain various advantage and disadvantage of QSAR model while application of new drug discovery. (10 marks)

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15BI3006 Systems Biology

Set B

Time : 3 hrs
Total Marks: 100

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1. Explain the expression level of the different molecules present in MAPK signaling pathway construction using cell designer with different modules. (20)

OR

2. a. Mention the algorithm involved in synaptic interaction and their excitable membranes interactions. (10)
   b. Pen down the steps involved in systems biology workbench and its applications. (10)

3. Explain how signals are passed through receptors in signaling networks. (20)

OR

4. What do you understand by metabolic networks, justify with an example. (20)

5. a. Mention the features involved in model Building (10)
   b. Pen down the steps involved in dynamics of biochemical reactions. (10)

OR

6. Explain in detail about the importance of stochastic simulation in different cell signaling pathways. (20)

7. Mention the working of dbsolve as a component of enzyme kinetic modelling module. (20)

OR

8. a. Write a short note on centrality parameters and network parameters. (10)

   b. Make a flow chart for genome metabolic reconstruction. (10)

9. a. What are the software's used for kinetic modeling. (5)

   b. Mention the different software's used in systems biology analysis. (5)

   c. Mention steps involved in Gillespie algorithm (10)

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