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PH—02—2024

FACULTY OF SCIENCE

B.Sc. (Sixth Semester) EXAMINATION

MARCH/APRIL, 2024

(New Pattern)

BIOINFORAMTICS

Paper CCBI-1F

(Concept of Genomics)

(Tuesday, 2-04-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—Three Hours *Maximum Marks*—75

Note :— (*i*) *All* questions are compulsory.

(*ii*) *All* questions carry equal marks.

(*iii*) Draw well labelled diagram wherever necessary.

1. Describe in detail about HGP. 15

Or

(*a*) Write in detail about C-value paradox. 8

(*b*) Write in detail about "Omics" revolution. 7

P.T.O.

2. Describe in detail about Illumina (solexa) sequencing. 15

Or

(*a*) Write down about shotgun sequencing in detail. 8

(*b*) Describe about metagenomics with suitable examples. 7

3. Write in detail about applications of genomics in various fields. 15

Or

(*a*) Write about high throughput sequencing in detail. 8

(*b*) Give an account on pyrosequencing. 7

4. Write in detail about early sequencing efforts. 15

Or

(*a*) Describe about subfields of genomics in brief. 8

(*b*) Describe about virus genomics. 7

5. Write short notes on (any *three*) : 15

(*a*) Pharmacogenomics

(*b*) Epigenetics

(*c*) Comparative genomics

(*d*) Bacteriophage genomics

(*e*) Genomics in agriculture.

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PH—07—2024

FACULTY OF SCIENCE

B.Sc. (BI) (Third Year) (Sixth Semester) EXAMINATION

APRIL/MAY, 2024

(New Pattern)

BIOINFORMATICS

Paper CCBI-2F

(Concept of Proteomics)

(Thursday, 4-4-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—Three Hours *Maximum Marks*—75

Note :— (*i*) *All* questions are compulsory.

(*ii*) Draw neat and well labelled diagram if necessary.

1. Explain in detail methods of determination of three-dimensional structure of proteins. 15

Or

(*a*) Describe applications of proteomics. 8

(*b*) Explain basic structure and components of proteins. 7

2. Explain the process of translation and post-translational modifications in proteins. 15

P.T.O.

Or

(*a*) Explain protein modifications by attachment of different functional groups. 8

(*b*) Describe protein modifications by proteolytic cleavage and formation of disulphide bonds. 7

3. Describe in detail principle, model diagram and applications of HPLC technique. 15

Or

(*a*) Explain 2D SDS-PAGE technique for protein separation. 8

(*b*) Explain protein extraction method from biological sample. 7

4. Describe in detail principle and applications of protein array. 15

Or

(*a*) Explain protein structure prediction tools. 8

(*b*) Write about protein-protein interactions. 7

5. Write short notes on any *three* : 3×5=15

(*a*) Protein identification by mass spectroscopy

(*b*) MALDI-TOF

(*c*) Size exclusion chromatography

(*d*) Ion exchange chromatography

(*e*) Isoelectric focusing.

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PH—20—2024

FACULTY OF SCIENCE

B.Sc. (Third Year) (Sixth Semester) EXAMINATION

APRIL/MAY, 2024

(New Pattern)

BIOINFORMATICS

(Drug and Molecular Modeling)

(Wednesday, 10-04-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—Three Hours *Maximum Marks*—75

Note :— (*i*) *All* questions are compulsory.

(*ii*) Draw neat and well labelled diagrams wherever necessary.

1. Describe in detail role of kidney in drug interaction with biomolecules. 15

Or

(*a*) Describe classification of drugs. 8

(*b*) Explain mechanism of drug interaction with plasma proteins. 7

2. Describe in detail mechanism of drug action with specific receptors. 15

Or

(*a*) Explain Lipinski's rule of 5. 8

(*b*) Explain importance of clinical trials in drug designing and development. 7

P.T.O.

3. Describe in detail in vivo mechanism of phase-I and phase-II drug biotransformation. 15

Or

(*a*) Write effects of drug doses on rate of metabolism. 8

(*b*) Explain enzyme inhibition and induction strategies in drug metabolism. 7

4. Explain in detail principal target sites and mode of action of anticancer agents. 15

Or

(*a*) Explain effect of alkylating agents against cancerous cells. 8

(*b*) Explain the concept of pharmacological activity of drug. 7

5. Write short notes on any *three* of the following : 15

(*a*) Types of molecular descriptors

(*b*) PubChem database

(*c*) Drug metabolism

(*d*) Drug receptors

(*e*) Routes of drug administration.

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PH—13—2024

FACULTY OF SCIENCE

B.Sc. (BI) (Third Year) (Sixth Semester) EXAMINATION

MARCH/APRIL, 2024

(New Pattern)

BIOINFORMATICS

Paper CCBI-3F

(Metabolomics)

(Saturday, 06-04-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—Three Hours *Maximum Marks*—75

Note :— (*i*) *All* questions are compulsory.

(*ii*) Draw neat and well labelled diagram if necessary.

1. Explain in detail the concepts of metabolome, catabolism, anabolism and metabonomics. 15

Or

(*a*) Describe applications of metabolomics in medical diagnosis and biomarker discovery. 8

(*b*) Explain applications of metabolomics in agriculture. 7

P.T.O.

2. Describe in detail biosynthesis of fatty acid by the action of fatty acid synthase complex. 15

Or

(*a*) Write an overview on amino acid catabolism. 8

(*b*) Describe the enzymatic steps for de novo biosynthesis of purine nucleotides. 7

3. Describe in detail principle, working operations and applications of gas chromatography. 15

Or

(*a*) Explain principle and operation strategy of HPLC. 8

(*b*) Describe detection of metabolites by mass spectroscopy. 7

4. Describe in detail visual comparison of metabolic pathways. 15

Or

(*a*) Write principle and applications of NMR spectroscopy. 8

(*b*) Explain XCMS statistical method. 7

5. Write short notes on (any *three*) : 3×5=15

(*a*) MALDI-TOF

(*b*) Gluconeogenesis

(*c*) Glycogenesis

(*d*) Glycogenolysis

(*e*) Computational metabolomics.

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PH—19—2024

FACULTY OF SCIENCE

B.Sc. (Third Year) (Sixth Semester) EXAMINATION

MARCH/APRIL, 2024

(New Pattern)

BIOINFORMATICS

(PHP Programming)

(Wednesday, 10-04-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—Three Hours *Maximum Marks*—75

Note :— (*i*) *All* questions are compulsory.

(*ii*) *All* questions carry equal marks.

(*iii*) Write answers with examples.

1. What are PHP array ? Write down the types of array with example. 15

Or

(*a*) Write a program for associative array. 8

(*b*) What is Browser redirection ? 7

P.T.O.

2. Describe in detail about PHP operators. 15

Or

(*a*) Write about recursive function with example. 8

(*b*) Describe about multidimensional array with example. 7

3. Describe in detail about string-string related library functions with example. 15

Or

(*a*) Write about while and do-while with example. 8

(*b*) Describe for loop with example. 7

4. Write in detail about function. Add a note on call by valve and call by reference. 15

Or

(*a*) Write down difference between Numeric and Associative Array. 8

(*b*) Write in brief about looping statements in PHP with example. 7

5. Write notes on (any *three*) : 3×5=15

(*a*) get method

(*b*) formating string

(*c*) if-else

(*d*) numeric array

(*e*) PHP benefits.