This question paper contains **2** printed pages]

NH—14—2023

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2023

(New Course)

BIOINFORMATICS

Paper-CCBI-3C

(Bio-programming Using C-Language)

(Monday, 4-12-2023) **Time : 2.00 p.m. to 5.00 p.m.**

Time—Three Hours *Maximum Marks*—75

N.B. :— (*i*) *All* questions are compulsory.

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

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

1. Explain character set, variables and keyword with example. 15

Or

(*a*) Explain decision-making statement with example. 8

(*b*) Write a program to find out given number is even or odd. 7

2. Explain array and types of array. 15

Or

(*a*) Explain storage classes and their scope rules. 8

(*b*) Explain looping statement with example. 7

P.T.O.

3. Explain function and returning function result. 15

Or

(*a*) Explain recursion with example. 8

(*b*) Explain pointer and array. 7

4. Explain structure. How to declare, initialize structure variable ? 15

Or

(*a*) Write the difference between structure and union. 8

(*b*) Explain input/output function with example. 7

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

(*a*) String library functions

(*b*) Union

(*c*) Pointer

(*d*) Use of command line argument

(*e*) Standard function.

This question paper contains **2** printed pages]

NH—22—2023

FACULTY OF SCIENCE

B.Sc. (Third Semester) EXAMINATION

NOVEMBER/DECEMBER, 2023

(New Course)

BIOINFORMATICS

(Advance Bioprogramming)

(Wednesday, 06-12-2023) **Time : 2.00 p.m. to 5.00 p.m.**

Time—Three Hours *Maximum Marks*—75

N.B. :— (*i*) *All* questions are compulsory.

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

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

1. What is Python ? Explain in detail its features and applications. 15

Or

(*a*) Explain in detail process of installing Python programming language. 8

(*b*) Write in detail about mathematical operations used in Python. 7

2. Explain in detail conditional statements used in Python with examples. 15

Or

(*a*) Write a program for while loop and break statement with explanation. 8

(*b*) How to create a class and object ? Explain with example. 7

P.T.O.

3. What is inheritance ? Explain single and multilevel inheritance with example. 15

Or

(*a*) Write in detail about object paradigm in Python. 8

(*b*) How to create an module ? Explasin with its example. 7

4. What is error ? Explain its types with examples. 15

Or

(*a*) How to replace a pattern in Python ? 8

(*b*) Describe in detail REGEX in bioinformatics. 7

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

(*a*) File handling

(*b*) Datatypes

(*c*) Function creation

(*d*) While loop

(*e*) Input/output statements.

This question paper contains **2** printed pages]

NH—08—2023

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2023

(New Course)

BIOINFORMATICS

Paper-CCBI-2C

(Biodiversity and Phylogenetics)

(Friday, 1-12-2023) **Time : 2.00 p.m. to 5.00 p.m.**

Time—Three Hours *Maximum Marks*—75

N.B. :— (*i*) *All* questions are compulsory.

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

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

1. What is biodiversity ? Discuss about benefits and threats to biodiversity. 15

Or

(*a*) Write in brief about five kingdom classification system. 8

(*b*) Write a note on "India as megadiversity nation". 7

2. What is biodiversity informatics ? Write about potentials of biodiversity informatics. 15

Or

(*a*) Give an account on Biodiversity Hotspots. 8

(*b*) Write a note on NBII. 7

3. Write notes on : 15

(*a*) Tree of life

(*b*) Species 2000

(*c*) GBIF.

P.T.O.

Or

(*a*) What is ITIS database ? 8

(*b*) What is genetic diversity ? 7

4. Write in detail about metadata and metadata standards. 15

Or

(*a*) Write a note on ICTV. 8

(*b*) What is barcode of life ? 7

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

(*a*) Genome complexity

(*b*) Types of trees

(*c*) MSA

(*d*) Phylogram

(*e*) AVIS.

This question paper contains **4** printed pages]

NH—21—2023

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2023

(New Pattern)

BIOINFORMATICS

Paper-DSEBI-4C

(Biostatistics)

(Wednesday, 06-12-2023) **Time : 2.00 p.m. to 5.00 p.m.**

Time—Three Hours *Maximum Marks*—75

N.B. :— (*i*) *All* questions are compulsory.

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

(*iii*) Use of non-programmatic calculator is allowed.

1. Write rules and steps for construction of histogram for 'equal class width' and 'unequal class widths' and draw a histogram to represent the following frequency distribution : 15

Wages in (Rs.)	**No. of Workers**
0—10	40
10—20	10
20—40	45
40—50	90

P.T.O.

Or

(*a*) Write definition, formulae and steps for computation of quartiles for ungrouped and grouped data. 8

(*b*) Calculate mode for the following data : 7

Class	**Frequency**
10—30	2
30—50	9
50—70	6
70—90	8

2. Calculate range and coefficient of variance for the following data : 15

Class	**Frequency**
15—25	10
25—35	20
35—45	15
45—55	25

Or

(*a*) Write definition, formulae and computation steps of standard deviation for individual series, discrete frequency distribution and continuous frequency distribution data. 8

(*b*) Write definition, formula and steps for computation of range individual series and add a note on merits and demerits of range. 7

3. Define probability and explain the concept of sample space, event, random experiment, outcome and axioms of probability. 15

Or

(*a*) Describe the types of events and give examples. 8

(*b*) Write the statement and give proof of addition theorem of probability. 7

4. Explain in detail addition, subtraction, multiplication, transpose and inverse of matrices with examples. 15

Or

(*a*) Find the value of a and k : 8

(*i*) $\lim\limits_{x \to (-a)} \dfrac{x^9 + a^9}{x + a} = 9$

(*ii*) $\lim\limits_{x \to 1} \dfrac{x^4 - 1}{x - 1} = \lim\limits_{x \to k} \dfrac{x^3 - k^3}{x^2 - k^2}$

(*b*) If $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & -1 & 3 \\ -1 & 0 & 2 \end{bmatrix}$, then find $2A - B$. 7

P.T.O.

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

(*i*) Conjugative of matrix

(*ii*) Set theory and notations

(*iii*) Pie diagram

(*iv*) Second quartile

(*v*) Types of statistical samples.

This question paper contains **2** printed pages]

NH—03—2023

FACULTY OF SCIENCE

B.Sc. (Third Semester) EXAMINATION

NOVEMBER/DECEMBER, 2023

(New Course)

BIOINFORMATICS

(Molecular Biology)

(Wednesday, 29-11-2023) **Time : 2.00 p.m. to 5.00 p.m.**

Time—Three Hours *Maximum Marks*—75

N.B. :— (*i*) *All* questions are compulsory.

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

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

1. Describe in detail Eukaryotic DNA replication. 15

Or

(*a*) Describe in detail Excision repair. 8

(*b*) Give a brief account on SOS repair. 7

2. Describe in detail Prokaryotic transcription. 15

Or

(*a*) Write in detail about Co & Post-transcriptional modification in m-RNA. 8

(*b*) Give an account on role of sigma factors. 7

3. Describe in detail Co & post-translational modifications in proteins. 15

Or

(*a*) Write in detail about Prokaryotic translation. 8

(*b*) Write a note on properties of genetic code. 7

P.T.O.

4. Describe in detail lac operon and its regulation. 15

Or

(*a*) Give an account on regulation of transcription in prokaryotes. 8

(*b*) Describe about trp operon. 7

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

(*i*) Ara operon

(*ii*) Recombination repair

(*iii*) DNA Gyrase

(*iv*) Cot curve

(*v*) *t*-RNA.