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GJ—31—2023

FACULTY OF SCIENCE

B.Sc. (Third Semester) EXAMINATION

APRIL/MAY, 2023

(New Course)

BIOINFORMATICS

(Advance Bioprogramming)

(Thursday, 27-04-2023) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *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 in detail features of Python and comparing Python with other languages. 15

Or

(*a*) Describe in detail mathematical operations used in Python. 8

(*b*) Explain in detail basic input/output statements used in Python. 7

2. What are looping statements ? Explain in detail for and while loop with examples. 15

Or

(*a*) Explain in detail how to deal with files with examples. 8

(*b*) Write a program for creating and importing a function. 7

3. What is Error ? How to handle a error using try and except block. 15

Or

(*a*) Explain in detail object paradigm used in Python. 8

(*b*) How to create a new datatype in Python. 7

4. What is regular expression ? Explain in detail pattern replace in Python. 15

Or

(*a*) How to make our code in Python programming language ? 8

(*b*) How to compile a pattern in Python ? 7

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

(*a*) Break statement

(*b*) Module creation

(*c*) Pattern replace

(*d*) Self-revaluation

(*e*) For loop.

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

GJ—11—2023

FACULTY OF SCIENCE

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

APRIL/MAY, 2023

(New Course)

BIOINFORMATICS

Paper–CCBI-2C

(Biodiversity and Phylogenetics)

(Friday, 21-04-2023) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *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 in detail about biodiversity informatics. 15

Or

(*a*) What are biodiversity database ? 8

(*b*) Write a note on biodiversity hotspots. 7

2. Write a note on ICTV and ICTV db. 15

Or

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

(*b*) What is Species 2000. 7

3. Write in detail about species identification. 15

Or

(*a*) What is DNA barcoding ? 8

(*b*) Write in brief about Metadata. 7

4. What is molecular phylogenetics ? Write in detail about terms used in phylogenetics. 15

Or

(*a*) What are phylogenetic trees ? 8

(*b*) What is multiple sequence alignment ? 7

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

(*a*) Genetic diversity

(*b*) ITIS

(*c*) Delta systems

(*d*) Genome complexity

(*e*) Metadata standards

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

GJ—18—2023

FACULTY OF SCIENCE

B.Sc. (Third Semester) EXAMINATION

APRIL/MAY, 2023

(New Pattern)

BIOINFORMATICS

(Bioprogramming Using C Language)

(Tuesday, 25-4-2023) **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*) Write programs wherever necessary.

1. Describe about C instructions in detail. 15

Or

(*a*) Write about console I/O functions in C language. 8

(*b*) Describe about disk I/O functions in C language. 7

2. Write in detail about pointers and arrays in C language. 15

Or

(*a*) Give an account on arrays and its types. 8

(*b*) Write about do while loop in C language. 7

P.T.O.

3. Write in detail about functions in C language. 15

Or

(*a*) Give an account on unions. 8

(*b*) Differentiate between structure and union. 7

4. Describe in detail about decision-making statements in C. 15

Or

(*a*) Write about hierarchy of operations in C language. 8

(*b*) Give an account on integer and float conversion. 7

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

(*a*) Strlen( )

(*b*) Scanf( )

(*c*) Structure

(*d*) Break statement

(*e*) Variables and keywords.

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GJ—30—2023

FACULTY OF SCIENCE

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

APRIL/MAY, 2023

(New Course)

BIOINFORMATICS

Paper – DSEBI–4C

(Biostatistics)

(Thursday, 27-04-2023) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

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

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

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

1. Define statistics and explain in detail concept and types of statistical population and sample. 15

Or

(*a*) Write steps and construct histogram with frequency polygon for the following data : 8

Groups	Frequecy
40 – 60	10
60 – 70	20
70 – 80	15
80 – 85	8
85 – 90	5

P.T.O.

(*b*) Represent the following data by a Pie diagram : 7

Items	**Expenditure (Rs.)**
Food	8,400
Clothing	5,000
Education	9,000
Rent	7,000
Miscellaneous	6,000

2. Explain the concept of Range and calculate range for the following grouped data : 15

C.I	**Frequency**
10 – 20	90
20 – 30	100
30 – 40	120
40 – 50	180
50 – 60	60

Or

(*a*) Calculate standard deviation for the following continuous frequency distribution data : 8

Class	**Frequency**
10 – 20	2
20 – 30	4
30 – 40	6
40 – 50	5
50 – 60	10

(*b*) Calculate coefficient of variation for the score obtained by 7 students of a scholar batch in a particular subject : 7

86, 81, 79, 76, 87, 86, 89

3. Prove the following theorems of probability : 15

(*i*) $P(A \cup B) = P(A) + P(B) - (A \cap B)$

(*ii*) $P(A \cup B) = P(A) + P(B)$

(*iii*) $P(A) + P(A') = 1$.

Or

(*a*) Define probability and explain the concept of sample space and event. 8

(*b*) Let X be the universal set, for the non-empty sets A and B, verify that : 7

(*i*) $(A \cup B)' = A' \cap B'$

(*ii*) $(A \cap B)' = A' \cup B'$, where

$X = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

$A = \{1, 2, 3, 4, 5\}$

$B = \{1, 2, 5, 6, 7\}$.

4. Write addition and multiplication properties of matrices and find the values of x and y from the following equation : 15

$$2\begin{bmatrix} x & 5 \\ 7 & y-3 \end{bmatrix} + \begin{bmatrix} 3 & -4 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} 7 & 6 \\ 15 & 14 \end{bmatrix}$$

P.T.O.

Or

(*a*) Evaluate : 8

$$\lim_{x \to 0} \frac{(1-x)^n - 1}{x}$$

(*b*) Explain the concepts of conjugative and inverse of matrix. 7

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

(*i*) Venn diagram

(*ii*) Set theory

(*iii*) Axioms of probability

(*iv*) Discrete and continuous data

(*v*) Mode computation.

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

GJ—04—2023

FACULTY OF SCIENCE

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

APRIL/MAY, 2023

(New Course)

BIOINFORMATICS

(Molecular Biology)

(Wednesday, 19-04-2023) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

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

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

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

1. Describe in detail Prokaryotic DNA replication. 15

Or

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

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

2. Write in detail about Co and Post-transcriptional modification in *m*-RNA. 15

Or

(*a*) Describe in detail Prokaryotic Transcription. 8

(*b*) Give an account on structure of Prokaryotic RNA polymerase. 7

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

Or

(*a*) Write in detail about Heat shock proteins. 8

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

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

Or

(*a*) Give an account on Regulation of transcription in Prokaryotes. 8

(*b*) Describe about ara operon. 7

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

(*a*) Sigma factor

(*b*) Excision repair

(*c*) DNA Helicase

(*d*) Properties of DNA

(*e*) *r*-RNA.