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

PH—08—2024

FACULTY OF SCIENCE

B.Sc. (Third Semester) EXAMINATION

APRIL/MAY, 2024

(New Pattern)

BIOINFORMATICS

(Biodiversity and Phylogenetics)

(Thursday, 4-4-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—Three Hours *Maximum Marks*—75

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

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

(*iii*) Draw diagrams wherever necessary.

1. Describe in detail about types of diversity. 15

Or

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

(*b*) Give an account an diversity informatics in India. 7

2. Write about GBIF and its role in biodiversity. 15

Or

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

(*b*) Describe about tree of life in detail. 7

P.T.O.

3. Write in detail about metadata and its standards. 15

Or

(*a*) Describe about databases and softwares for identification of species. 8

(*b*) Describe about ITIS in detail. 7

4. Describe about methods for phylogenetics prediction. 15

Or

(*a*) Describe multiple sequence alignment in detail. 8

(*b*) Give an account on genome complexity. 7

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

(*a*) Rooted and unrooted tree

(*b*) AVIS

(*c*) Hotspots of diversity in India

(*d*) Three kingdom classification

(*e*) Barcode of life.

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

PH—14—2024

FACULTY OF SCIENCE

B.Sc. (Third Semester) EXAMINATION

MARCH/APRIL, 2024

(New Pattern)

BIOINFORMATICS

(Bioprogramming Using C Language)

(Saturday, 06-04-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—Three Hours *Maximum Marks*—75

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

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

(*iii*) Write programs wherever necessary.

1. Describe in detail datatypes in C language. 15

Or

(*a*) Give an account on arithmetic instructions in C language. 8

(*b*) Write about storage classes and their scope rules. 7

2. Write in detail about looping statements in C language. 15

Or

(*a*) What are strings ? Describe some string library functions. 8

(*b*) Write about recursion in C language. 7

P.T.O.

3. Describe in detail functions in C language. 15

Or

(*a*) What are arrays ? Describe its types. 8

(*b*) Write about switch statement in C language. 7

4. Describe about structure with proper example. 15

Or

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

(*b*) Give an account on use of command line arguments. 7

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

(*a*) Putchar()

(*b*) Pointers

(*c*) If statement

(*d*) Keywords

(*e*) Character set in C language.

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

PH—21—2024

FACULTY OF SCIENCE

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

MARCH/APRIL, 2024

(New Pattern)

Paper DSEBI-4C

(Biostatistics)

(Wednesday, 10-04-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—Three Hours *Maximum Marks*—75

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

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

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

1. Explain steps for construction of histogram, polygram and frequency curve with suitable examples. 15

Or

(*a*) Find arithmetic mean of the following data : 8

Class	Frequency
10—20	10

P.T.O.

20—30	5
30—40	8
40—50	3
50—60	7
60—70	4

(*b*) Explain the concept of central tendency and write its merits and demerits. 7

2. Prove the following theorems of probability :

(*i*) $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ where A and B are any two events (use Venn diagram)

(*ii*) $P(A \cup B) = P(A) + P(B)$ where A and B are mutually exclusive events.

(*iii*) $P(A) + P(A') = 1$ where A and A' are complementary events. 15

Or

(*a*) What is conditional probability ? Solve the problem given below.

Find the probability that a single toss of a die will result in a number less than 4 if it is given that the toss resulted in an odd number. 8

(*b*) Write statement and proof of Bayes theorem. 7

3. Write definition, formulae and computation steps of variance for ungrouped and grouped data. 15

Or

(*a*) Find range of the following data : 8

Class	Frequency
85—95	4
95—105	5
105—115	18
115—125	3
125—135	27
135—145	2

(*b*) Write definition, formula and computation steps of coefficient of variance for ungrouped data. 7

4. Explain the concept of matrix and write properties of addition and multiplication of matrices. 15

Or

(*a*) If $A = \begin{bmatrix} 3 & \sqrt{3} & 2 \\ 4 & 2 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & -1 & 2 \\ 1 & 2 & 4 \end{bmatrix}$, verify that : 8

(*i*) $(A')' = A$

(*ii*) $(A + B') = A' + B'$

(*iii*) $(kB)' = kB'$

(*b*) Evaluate : 7

$$\lim_{x \to a} \frac{(x+2)^{\frac{5}{3}} - (a+2)^{5/3}}{x - a}$$

P.T.O.

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

(*i*) Conjugate of a matrix

(*ii*) Merits and demerits of measures of dispersion

(*iii*) Types of set

(*iv*) Pie diagram

(*v*) Statistical population.

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

PH—03—2024

FACULTY OF SCIENCE

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

MARCH/APRIL, 2024

(New Pattern)

BIOINFORMATICS

Paper CCBI-1C

(Molecular Biology)

(Tuesday, 2-04-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—Three Hours *Maximum Marks*—75

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

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

1. Describe in detail process of DNA replication in eukaryotes. 15

Or

(*a*) Write a note on SOS repair. 8

(*b*) Write a note on cot curve. 7

2. Describe in detail Co & post-transcriptional modification of RNA. 15

Or

(*a*) Discuss process of prokaryotic transcription process. 8

(*b*) Write a note on structures of gene. 7

P.T.O.

3. Describe in detail translation in eukaryotes. 15

Or

(*a*) Write a note on post-translational modification of proteins. 8

(*b*) Write a note on role of RNAs. 7

4. Write a note on regulation of lactose operon. 15

Or

(*a*) Write a note on trp-operon. 8

(*b*) Describe in detail regulation of transcription in prokaryotes. 7

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

(*a*) Heat shock proteins

(*b*) Sigma factors

(*c*) Photoreactivation

(*d*) Ribosome

(*e*) Models of DNA replication.