

Exam. Code : 103202

Subject Code : 1345

B.A./B.Sc. 2nd Semester

BIOINFORMATICS

(Basic Mathematics, Biostatistics &

Database Management System)

Time Allowed—Three Hours] [Maximum Marks—75

Note :— Section A is compulsory. Each part is of 1.5 marks.Attempt **ONE** question from each unit of Section B.

Each question is of 15 marks.

SECTION—A

1. Briefly define transpose of a Matrix.

2. If $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 1 \\ 1 & 0 & 0 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 1 & 0 \\ 0 & 0 & 1 \\ 2 & 0 & 1 \end{bmatrix}$ then calculate

AB.

3. Briefly define scalar dot product of vectors.

4. What do you understand by first order differential equation ?

5. Briefly define conditional probability.

6. Briefly explain linear correlation.

7. Briefly define DML statements.
8. Briefly differentiate between Unique and Primary Keys.
9. Briefly explain Entity with suitable example.
10. What do you understand by PL/SQL ? $1.5 \times 10 = 15$

SECTION—B

UNIT—I

1. (A) Find the inverse of the following matrix :

$$A = \begin{bmatrix} 0 & 1 & 2 \\ 1 & 2 & 3 \\ 3 & 1 & 1 \end{bmatrix}. \quad 10$$

(B) Differentiate $(3x^2 - 9x + 5)$ w.r.t. x . 5

2. (A) Write short notes on the following :

(i) Ordinary Differential Equation

(ii) Order of Differential Equation

(iii) Degree of Differential Equation. 9

- (B) Evaluate :

$$\int \frac{(x^2 + 8)^2}{x^4} dx. \quad 6$$

UNIT—II

3. (A) Briefly discuss the following :

- (i) Mean
- (ii) Median
- (iii) Mode
- (iv) Standard Deviation
- (v) Variance. 10

(B) 12 cards, numbered 1 to 12 are placed in a box, mixed up thoroughly and then a card is drawn at random from the box. If it is known that the number on the card is more than 3, find the probability that it is an even number. 5

4. (A) Discuss Binomial Distribution in detail. 8

(B) Calculate the correlation coefficient for the following paired data :

X → 9 8 6 5 8 3 7 4 6 10

Y → 7 5 7 4 7 3 6 1 5 8 7

UNIT—III

5. What is the significance of normalization ? Discuss the various forms of normalization along with suitable examples. 15

6. (A) Discuss the significance and use of DBMS. 7

(B) Write short notes on :

- (i) Database Languages
- (ii) Data Independence. 8

UNIT—IV

7. (A) Discuss in detail various DML statements along with their usage in queries. 10
- (B) Write a short note on nested queries with suitable example. 5
8. (A) Differentiate between local and stored procedures with suitable examples. 8
- (B) Discuss the significance of view in SQL with suitable illustration. 7