KRISHNAUNIVERSITY

BSc-IYEAR:DATA SCIENCE:ISEMESTER(CBCS)

PAPER-1: MATHAMATICAL FOUNDATION FOR DATA SCIENCE

TIME:3Hours

MODELQUESTIONPAPERMaxMarks:75

Answerany5Questions

SECTION-A

1.What are the types of properties of a matrix?

2.Write differences between a singular and non-singular matrix?

3.How do you find the inverse of a matrix by cayley Hamilton theorem?

4.Find the eigne values and eigne vectors for the following matrix

$$\begin{bmatrix} 3 & 8 \\ 4 & 6 \end{bmatrix}$$

5.How do you reduce a matrix to echelon form?what is the difference between echelon and reduced echelon form?

6.what is the difference between linear equation and linear inequality?How do you slove variables?

7.What is real valued function?Give examples?How do you differentiate a function with two variables?

8.Find the value of $\lim_{x\to 5} \frac{x^2-5}{x^2+x-30}$

SECTION –B

Unit-1

9.Write the properties of inverse matrix .How do you use an inverse matrix to solve a linear system?

(OR)

Find the inverse matrix to the given matrix A using the cayley-Hamilton theorem following

$$A=\begin{bmatrix} 2 & -3 & 1 \\ 2 & 0 & -1 \\ 1 & 4 & 5 \end{bmatrix}$$

Unit-2

10.Suppose that M,p are two non singular matrix.Prove that there is a matrix N such that MN=P

(OR)

Suppose that A is 2 x 2 matrix that has eigen values -1 and 3.Then fo each positive integer n find a_n and b_n such that A^{n+1} =a_nA+b_nI where I is the 2×2 identity matrix.

Unit -3

11.What are the three methods fo solving systems of equations?How do you write a system f linear equations?

(OR)

what are the three components and the types of linear programming? Write its applications and limitations.

Unit-4

12. What are the applications of real-valued functions of more variables? Find the domain and range of the following function

f(x,y)=$\sqrt{36 - 9x^2 - 9y^2}$

(OR)

What are two variables functions? Find the domain the range of each of the following functions

a.f(x,y)=3x+5y+2

b.g(x,y)=$\sqrt{9 - x^2 - y^2}$

Unit-5

13.What is continuity of a function? Where is a function differentiable? Howdo you know if a function is a differentiable and continuity?

(OR)

Show that the function f(x)=$|x|+|x - 1|$ is differentiable for all real numbers except θ and 1