Hall Ticket Number :

Code: 19AC11T

I B.Tech. I Semester Supplementary Examinations June 2024

Algebra and Calculus

(Common to All Branches)

Max. Marks: 70   Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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		Marks	CO	BL

UNIT–I

1. Solve the system of equations by matrix method
   $x + y + z = 6, 2x + 3y - 2z = 2, 5x + y + 2z = 13$ — 14M CO1 L3

OR

2. Find the Eigen values and Eigen vectors of the matrix

   A= $\begin{bmatrix} 2 & 2 & 0 \\ 2 & 5 & 0 \\ 0 & 0 & 3 \end{bmatrix}$ — 14M CO1 L3

UNIT–II

3. Diagonalize the matrix A= $\begin{bmatrix} 8 & -8 & -2 \\ 4 & -3 & -2 \\ 3 & -4 & 1 \end{bmatrix}$ — 14M CO2 L2

OR

4. Verify Cayley-Hamilton theorem for the matrix A= $\begin{bmatrix} 1 & 2 & -1 \\ 2 & 1 & -2 \\ 2 & -2 & 1 \end{bmatrix}$ and hence

   find A^{-1} using Cayley-Hamilton theorem. — 14M CO2 L2

UNIT–III

5. Find the minimum value of $x^2 + y^2 + z^2$ given $x + y + z = 3a$ — 14M CO3 L3

OR

6. a) Find the first and second partial derivatives of $z = x^3 + y^3 - 3axy$ — 7M CO3 L3

   b) If $z = f(x+ct) + g(x-ct)$ then prove that $\dfrac{\partial^2 z}{\partial t^2} = c^2 \dfrac{\partial^2 z}{\partial x^2}$ — 7M CO3 L2

UNIT–IV

7. Trace the curve $r^2 = a^2 \cos 2\theta$ — 14M CO4 L4

OR

8. a) Using Maclaurin's series, expand $\sin x$ in powers of x. — 7M CO4 L3

   b) Using Taylor's theorem, express the polynomial $2x^3 + 7x^2 + x - 6$ in powers
   of $(x-1)$. — 7M CO4 L3

UNIT–V

9. Evaluate $\displaystyle\int_0^\pi \int_0^{a\sin\theta} r \, dr \, d\theta$ — 14M CO5 L3

OR

10. Evaluate $\displaystyle\int_0^{\pi/2} \sin^6 \theta \cos^7 \theta \, d\theta$ — 14M CO5 L3

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Code: 19A511T

I B.Tech. I Semester Supplementary Examinations June 2024
Problem Solving and C Programming
(Common to All Branches)

Max. Marks: 70   Time: 3 Hours
Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)
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Marks

UNIT–I

1. a) Describe Structure of C Program   5M

   b) What are identifiers? What are the rules for declaring identifiers? Give example.   9M

OR

2. a) What is an algorithm? Describe the characteristics of an Algorithm   6M

   b) What is data type? Explain basic data types and their sizes used in a C Language   8M

UNIT–II

3. a) Describe Conditional Statements Used in C Language   7M

   b) Write a program on calculating area and perimeter of square   7M

OR

4. a) Explain various iterative statements available in C language with examples.   8M

   b) Write a program to find out whether the given number is Armstrong or not?   6M

UNIT–III

5. a) Define string. Explain declaration of string. Explain any three string handling functions
      with neat syntax and example.   8M

   b) Write C program to concatenate two strings without using strcat( ) function   6M

OR

6. a) Explain the following key words with example. i) auto ii) register iii) static iv) extern.   8M

   b) Write a c program to illustrate functions with arguments and returning value.   6M

UNIT–IV

7. a) Define pointer. Explain pointer arithmetic operations.   7M

   b) Explain call by reference with an example program.   7M

OR

8. a) Explain dynamic memory allocation functions.   7M

   b) Write a C program to demonstrate array of pointers.   7M

UNIT–V

9. a) Define structure and union. Explain the syntax and accessing elements from
      structure and union with an example.   8M

   b) Write a C program to maintain a record of n students with four fields (Roll no, name,
      marks and grade). Print the student details using structures.   6M

OR

10. a) Define file. Write a C program copy contents from one file to another file.   8M

    b) Discuss about file operations.   6M

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