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<b>R-19</b>
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**Code: 19A511T**

I B.Tech. I Semester Supplementary Examinations July 2022

**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) What is Programming Language? What is the generation of programming Language? Describe it briefly. 10M  
b) Describe Structure of C Language 4M

**OR**

2. a) Distinguish between printf() and scanf() in the C language 7M  
b) What is a flow chart? How it is different from an Algorithm 7M

**UNIT-II**

3. a) Explain with examples, any Four types of operators. 7M  
b) Explain for loop and nested for loop with suitable example. 7M

**OR**

4. a) Describe Conditional Statements Used in C Language 7M  
b) Write a program on calculating area and perimeter of square 7M

**UNIT-III**

5. a) What is a function in c? How function is declared. Explain with an example. 7M  
b) Illustrate the storage classes extern, static and auto with an example. 7M

**OR**

6. a) Explain the following string handling functions with examples:  
(i) strcpy( ) (ii) strcat( ) (iii) strrev( ) (iv) strlen 8M  
b) Explain Preprocessor commands with examples. 6M

**UNIT-IV**

7. a) What is a pointer? What are the advantages of pointers? 7M  
b) Explain dynamic memory allocation with examples 7M

**OR**

8. a) Explain about pointer arithmetic and arrays with example. 7M  
b) Write a c program to swap two numbers using call by value and call by reference. 7M

**UNIT-V**

9. a) Define Structure? How structures are initialized? Explain with example. 7M  
b) Write a C program read and write the content of the file using fprintf( ) and fscanf( ) functions. 7M

**OR**

10. a) Explain the following functions in files:  
(i) fseek( ) (ii) ftell( ) (iii) foef( ) (iv) fopen( ) 8M  
b) Define and write the syntax of the structure and union and give example for each one 7M

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**Code: 19AC11T**

I B.Tech. I Semester Supplementary Examinations July 2022

**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	Blooms Level
<b>UNIT-I</b>			
1. Solve the system of equations by matrix method $x + y + z = 6, 2x + 3y - 2z = 2, 5x + y + 2z = 13$	14M	CO1	L3
<b>OR</b>			
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
<b>UNIT-II</b>			
3. Verify Cayley-Hamilton theorem for the matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 5 \\ 3 & 5 & 6 \end{bmatrix}$ and hence find $A^{-1}$ using Cayley-Hamilton theorem.	14M	CO2	L2
<b>OR</b>			
4. Reduce the quadratic form $x_1^2 + 3x_2^2 + 3x_3^2 - 2x_2x_3$ to canonical form by using orthogonal transformation.	14M	CO2	L3
<b>UNIT-III</b>			
5. If $u = x^2 - y^2, v = 2xy$ where $x = r \cos \theta, y = r \sin \theta$ , then show that $\frac{\partial(u,v)}{\partial(r,\theta)} = 4r^3$	14M	CO3	L2
<b>OR</b>			
6. Find three positive numbers whose sum is 100 and whose product is maximum.	14M	CO3	L3
<b>UNIT-IV</b>			
7. a) Expand $\sin x$ in powers of $(x - \frac{f}{2})$ .	7M	CO4	L3
b) Using Maclaurin's series, expand $\log(1+x)$ in powers of $x$ .	7M	CO4	L3
<b>OR</b>			
8. Trace the curve $x^3 + y^3 = 3axy$	14M	CO4	L4
<b>UNIT-V</b>			
9. a) Evaluate $\int_0^2 \int_0^3 xy dx dy$	7M	CO5	L3
b) Evaluate $\int_0^2 \int_0^x y dy dx$	7M	CO5	L3
<b>OR</b>			
10. a) Evaluate $\int_0^1 x^5 (1-x)^3 dx$ using Beta function.	7M	CO5	L3
b) Evaluate $\int_0^\infty x^6 e^{-2x} dx$	7M	CO5	L3

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<b>R-19</b>
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**Code: 19AC14T**

I B.Tech. I Semester Supplementary Examinations July 2022

**Engineering Chemistry**

( Computer Science and Engineering )

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	Blooms Level
<b>UNIT-I</b>			
1. a) Derive Nernst equation for single electrode.	7M	CO1	L4
b) Explain the terms i. EMF . ii. Standard electrode potential.	7M	CO1	L2
<b>OR</b>			
2. a) What are concentration cells? Derive an expression for EMF of a concentration cell	10M	CO1	L4
b) Discuss the role of salt bridge in electrochemical cell.	4M	CO1	L3
<b>UNIT-II</b>			
3. a) What are the important applications of batteries?	7M	CO2	L1
b) Discuss the working principle construction and chemistry of battery	7M	CO2	L3
		Li-MnO <sub>2</sub>	
<b>OR</b>			
4. a) What is photo voltaic cell? Discuss about construction of photo voltaic cell.	7M	CO3	L3
b) List out the steps involved in production of solar grade silicon semiconductor.	7M	CO3	L4
<b>UNIT-III</b>			
5. What is solar grade silicon? Discuss production of solar grade silicon from quartz.	14M	CO3	L2
<b>OR</b>			
6. a) Define conducting polymer? Describe the synthesis and applications of poly acetylene as conducting polymer.	10M	CO4	L3
b) Mention few properties and applications of bakelite.	4M	CO4	L1
<b>UNIT-IV</b>			
7. a) Classify different types of polymerization methods.	7M	CO4	L4
b) Discuss the preparation properties and applications of Buna-N.	7M	CO4	L3
<b>OR</b>			
8. a) Describe the preparation properties and applications of Buna-S.	7M	CO4	L2
b) Illustrate mechanism of anionic addition polymerization.	7M	CO4	L2
<b>UNIT-V</b>			
9. What are the nano materials? Discuss various steps involved in sol gel method of synthesizing nano materials.	14M	CO5	L3
<b>OR</b>			
10. a) Write short note on molecular elevator.	7M	CO5	L1
b) Discuss about the proto type linear motion in rotaxanes.	7M	CO5	L3

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