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**R-17**

**Code: 7G131**

II B.Tech. I Semester Supplementary Examinations August 2021

**Advanced Data Structures Through C++**

( 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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**UNIT-I**

- 1. a) Define function? Explain about inline function with example 6M
- b) Describe the purpose of friend functions with suitable examples 8M
- OR**
- 2. a) Illustrate the significance of access specifiers in a class of C++? 7M
- b) How do you create a static member function? Explain with example 7M

**UNIT-II**

- 3. What is function overloading? Explain in detail with examples 14M
- OR**
- 4. Define inheritance. Discuss types of inheritance with examples 14M

**UNIT-III**

- 5. a) What are the advantages of stacks? 4M
- b) Illustrate an implementation of stack ADT in C++ with example. 10M
- OR**
- 6. a) Explain the different methods that are used to calculate hash functions? 7M
- b) How do you resolve collision explain any two collision resolving methods? 7M

**UNIT-IV**

- 7. a) Define BST. Demonstrate its operations with suitable examples 7M
- b) Demonstrate Priority Queue using Heaps with examples 7M
- OR**
- 8. a) What is an AVL Tree? Explain various steps for AVL search tree insertion with illustrations. 7M
- b) Write an algorithm for in-order traversal of a binary tree. Explain with an example 7M

**UNIT-V**

- 9. Define splay tree. Give the algorithms for insertion and deletion operations on splay trees. 14M
- OR**
- 10. Explain an algorithm with an example for Brute-Force pattern matching, and write a C++ program. 14M

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<b>R-17</b>
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**Code: 7G132**

II B.Tech. I Semester Supplementary Examinations August 2021

**Database Management Systems**  
( Computer Science and Engineering )

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit ( 5 x 14 = 70 Marks )

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	Marks	CO	Blooms Level
<b>UNIT-I</b>			
1. a) Define a Relational database? Explain with an example.	7M	CO1	L1,L2
b) Discuss about database applications.	7M	CO1	L2
<b>OR</b>			
2. a) Differentiate Two and Three-Tier architectures.	7M	CO1	L2
b) List out the functions of Database Administrator.	7M	CO1	L1
<b>UNIT-II</b>			
3. List and explain the additional features of an ER model.	14M	CO2	L1
<b>OR</b>			
4. a) Explain about a relation schema and a relation instance using an example.	7M	CO2	L2
b) Discuss about Integrity constraints over Relations.	7M	CO2	L2
<b>UNIT-III</b>			
5. a) List and explain any 4 Data Definition commands.	7M	CO3	L1
b) Describe the process of creating, altering and updating a view.	7M	CO3	L2
<b>OR</b>			
6. a) Illustrate the basic concepts behind Triggers in SQL.	7M	CO3	L4
b) Differentiate the stored procedures and functions in Procedural SQL.	7M	CO3	L2
<b>UNIT-IV</b>			
7. a) List out and explain the problems caused by Redundancy.	7M	CO4	L1
b) Discuss briefly about Third NF with example.	7M	CO4	L2
<b>OR</b>			
8. List out the properties of Decomposition and discuss.	14M	CO4	L1,L2
<b>UNIT-V</b>			
9. Describe the Lock-Based Concurrency Control for concurrent execution of transactions in detail.	14M	CO5	L2
<b>OR</b>			
10. a) Discuss about Serializability in concurrent execution of transaction.	7M	CO5	L2
b) Discuss briefly about the ACID properties.	7M	CO5	L2

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Code: 7G134

II B.Tech. I Semester Supplementary Examinations August 2021

**Discrete Mathematics**

( Computer Science and Engineering )

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit ( 5 x 14 = 70 Marks )

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	Marks	CO	Blooms Level
<b>UNIT-I</b>			
1. a) Define Compound Statement and explain all the connectives.	10M	CO1	L2
b) Construct truth table for $(P \vee Q) \vee (P \vee \sim Q)$	4M	CO1	L6
<b>OR</b>			
2. a) Define Normal Form and explain the different types of Normal Forms	8M	CO1	L2
b) Obtain the PDNF for $\sim P \vee Q$	6M	CO1	L2
<b>UNIT-II</b>			
3. Define Relation What are the different types of relations with example	14M	CO2	L2
<b>OR</b>			
4. a) Draw the Hasse Diagram representing the positive divisors of 36	7M	CO2	L4
b) Let f and g be functions from R to R defined by $f(x) = ax + b$ and $g(x) = 1 - x + x^2$ , if $(g \circ f)(x) = 9x^2 - 9x + 3$ , determine a, b.	7M	CO2	L2
<b>UNIT-III</b>			
5. a) Define Group and explain the properties of a group	8M	CO3	L2
b) Show that every cyclic group of order n is isomorphic to the group $\langle \mathbb{Z}_n, + \rangle$	6M	CO3	L3
<b>OR</b>			
6. a) In How many ways can the 26 letters of the alphabet be permuted so that none of the patterns car, dog, pun or bytes occurs	8M	CO3	L3
b) Explain the term Pigeonhole Principle.	6M	CO3	L2
<b>UNIT-IV</b>			
7. a) Find the sequences generated by the following functions: $(1 + 3x)^{-1/3}$	8M	CO4	L2
b) Find the generating functions for the following sequences $1^2, 2^2, 3^2, \dots$	6M	CO4	L2
<b>OR</b>			
8. a) Solve the recurrence relation $3a_{n+1} - 4a_n = 0, n \geq 0, a_0 = 5$ .	8M	CO4	L3
b) Find the sequence generated by the following function $(3+x)^3$	6M	CO4	L3
<b>UNIT-V</b>			
9. a) Define the term Graph and Representation of a Graph.	7M	CO5	L2
b) When it can be said that two graphs G1 and G2 are isomorphic	7M	CO5	L3
<b>OR</b>			
10. Define Spanning Tree and explain Kruskal's algorithm with example.	14M	CO5	L2

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**Code: 7G133**

II B.Tech. I Semester Supplementary Examinations August 2021

**Digital Logic Design**

( 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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**UNIT-I**

- 1. a) Demonstrate n's complement and n-1's complement of a number? Explain it with an example? 7M
- b) List the truth table for the Boolean function
  - (i)  $F = XY + XY' + Y'Z$
  - (ii)  $F = Y'Z + WXY' + WXZ' + W'X'Z$  7M

**OR**

- 2. a) Express the following functions as a sum of min terms and as a product of max terms:  $F(A,B,C) = B'C + A'C + BC$  6M
- b) What is self-complementary code? Explain with the example 8M

**UNIT-II**

- 3. a) Why NAND and NOR gates are called as Universal gates? Explain? 6M
- b) For the Boolean function  $F = A'C + A'B + AB'C + BC$ ,
  - (i) Express this function as a sum of Min-terms
  - (ii) Find the minimal sum-of-products expression. 8M

**OR**

- 4. a) Minimize the function  $F = m(0,2,4,6,7,8,10,12,13,15)$  using K-Map and obtain SOP form of it 7M
- b) Simplify the following Boolean function together with the don't care conditions and simplify into SOP form  
 $F(A,B,C,D) = m(4,5,6,7,12,13,14), d(A,B,C,D) = m(1,9,11,15)$  7M

**UNIT-III**

- 5. a) Implement a Full-adder using two Half Adders and one OR gate? 7M
- b) Implement a 2-bit Binary Multiplier using logic gates? 7M

**OR**

- 6. Design a combinational circuit that generates the 9's complement of a BCD digit? 14M

**UNIT-IV**

- 7. a) Explain the Logic diagram of JK Flip-Flop? 7M
- b) Draw the excitation table of SR, T and D Flip-Flop? 7M

**OR**

- 8. Explain Universal Shift Register with neat diagram? 14M

**UNIT-V**

- 9. a) Compare programmable logic devices PROM, PLA and PAL? 8M
- b) Explain about Hamming code? 6M

**OR**

- 10. Realize the following Boolean function using PROM  
 $F(x, y, z, w) = m(0, 1, 3, 6, 8, 9, 15)$ . 14M

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**R-17**

**Code: 7GC32**

II B.Tech. I Semester Supplementary Examinations August 2021

**Engineering Mathematics-III**

( 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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**UNIT-I**

1. a) Using the bisection method, find a real root of the equation  $\cos x = x e^x$  correct to three decimal places. 7M
- b) Apply fourth order Runge-Kutta method to  $\frac{dy}{dx} = 3x + \frac{1}{2}y$ ,  $y(0) = 1$  determine  $y(0.1)$  correct to four decimal places. 7M

**OR**

2. Find the real root of the equation  $x e^x = 3$  by Regular-falsi method. 14M

**UNIT-II**

3. Using Lagrange formula find  $f(4)$ . Given
- |   |    |   |    |     |
|---|----|---|----|-----|
| x | 0  | 2 | 3  | 6   |
| y | -4 | 2 | 14 | 158 |
- 14M

**OR**

4. Evaluate  $\int_0^1 \sqrt{1+x^3} dx$  taking  $h = 0.1$  Using (i) Simpson's 1/3 rd rule (ii) Trapezoidal rule. 14M

**UNIT-III**

5. Fit a second degree parabola to the following data by the method of least squares
- |   |    |    |    |    |    |
|---|----|----|----|----|----|
| x | 10 | 12 | 15 | 23 | 20 |
| y | 14 | 17 | 23 | 25 | 21 |
- 14M

**OR**

6. Form a partial differential equation from  $z = f(x + y)$ . 14M

**UNIT-IV**

7. Obtain the Fourier series for  $f(x) = x - x^2$  in the interval  $[-f, f]$ . Hence show that
- $$\frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \frac{1}{5^2} - \frac{1}{6^2} + \dots = \frac{f^2}{12}$$
- 14M

**OR**

8. Find the half range cosine series for the function  $f(t) = t - t^2$ , in  $0 < t < 1$  14M

**UNIT-V**

9. Find the Fourier cosine transform of  $f(x) = e^{-ax}$  ( $x > 0, a > 0$ ). 14M

**OR**

10. Find the Fourier transform of  $f(x)$  given by  $f(x) = \begin{cases} 1, & \text{for } |x| < 1 \\ 0, & \text{for } |x| > 1 \end{cases}$  hence evaluate  $\int_0^\infty \frac{\sin x}{x} dx$  14M

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<b>R-17</b>
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**Code: 7G135**

II B.Tech. I Semester Supplementary Examinations August 2021

## **Web Programming**

( 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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<b>UNIT-I</b>
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1. a) Write any Five Text Formatting elements in HTML.
- b) Explain the HTML Directory Structure with examples.

**OR**

2. a) Explain the inline elements in HTML with example
- b) List the new features in HTML5 comparing with earlier versions.

<b>UNIT-II</b>
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3. a) What is Accessible Tables in html
- b) What is focus in HTML form?

**OR**

4. What you mean by row spanning and column spanning? Explain with example program.

<b>UNIT-III</b>
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5. Define an HTML Table. How to set the border spacing for a table, using the CSS border-spacing property.

**OR**

6. a) Explain the different parts of CSS Box model.
- b) When to use DTD and when not to use DTD? Explain.

<b>UNIT-IV</b>
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7. a) What is java script and Write the features of JavaScript.
- b) Discuss about different types of data types supported by java script.

**OR**

8. a) Write a java script to find sum of first n even numbers and display the result. Read the value of n from the user.
- b) What is JavaScript console? How do I fix JavaScript console error?

<b>UNIT-V</b>
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9. a) Is jQuery front end or backend? Explain with example.
- b) Write about AJAX get() and post() Methods

**OR**

10. Name any five jQuery Events. Illustrate the usage of those events with an example.

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