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**R-17**

**Code: 7G131**

II B.Tech. I Semester Supplementary Examinations March 2021

# Advanced Data Structures Through C++

( 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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**UNIT–I**

1. a) Explain the basic principles of object oriented programming
   b) Define class? How the member functions can be defined with examples

**OR**

2. a) Write about parameter passing methods in C++ with examples
   b) Demonstrate static class members with the help of an example.

**UNIT–II**

3. a) Define Constructor. Explain types of constructors with examples.

**OR**

4. a) What is abstract class?
   b) Write a C++ Program to implement the abstract class.

**UNIT–III**

5. a) Define a Queue. List out any four applications of Queue.
   b) Discuss about linked implementation of queue ADT.

**OR**

6. Define Hash Table? Discuss in detail about collision resolution technique?

**UNIT–IV**

7. a) What are the properties of Priority Queues?
   b) Demonstrate Binary Tree Traversal Techniques with algorithms.

**OR**

8. a) Define AVL Trees. Explain the ADT of AVL Tree.
   b) Create an AVL tree with the following elements:
   (12,22,54,19,11,84,63,17,15,4,13)

**UNIT–V**

9. a) Describe Boyer-Moore algorithm with an example.
   b) What is a Red-Black Tree? List its properties.

**OR**

10. Write short notes on the following
    Standard Tries ii. Compressed Tries and iii. Suffix Tries

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**R-17**

**Code: 7G132**

II B.Tech. I Semester Supplementary Examinations March 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 )

*********

**UNIT–I**

1. a) List and explain the disadvantages of file processing systems. 7M
   b) What are five main functions of a database management administrator? 7M

**OR**

2. a) What are the advantages of DBMS? Explain. 7M
   b) Explain the advantages of using a query language instead of custom programs to process data. 7M

**UNIT–II**

3. a) What is a relation? Differentiate between a relation schema and a relation instance. 7M
   b) With examples, explain enforcing integrity constraint. 7M

**OR**

4. a) Name the main steps in database design. What is the goal of each step? In which step is the E-R model mainly used? 7M
   b) Draw ER diagram for the internet shop. 7M

**UNIT–III**

5. a) Briefly discuss about data definition commands in SQL 7M
   b) Briefly discuss about SQL join operators with examples. 7M

**OR**

6. a) Briefly discuss about data manipulation commands in SQL 7M
   b) Briefly discuss about aggregate functions? Explain about ‘group by’ and ‘having’ clauses. 7M

**UNIT–IV**

7. a) What is redundancy? Discuss the problems that may be caused by the redundancy with an example. 7M
   b) Define normalization. Explain second normal form with a suitable example. 7M

**OR**

8. a) Define functional dependencies. How are primary keys related to FDs? 7M
   b) When is a de composition said to be dependency-preserving? why is this property Useful? 7M

**UNIT–V**

9. a) Briefly discuss the AICD prosperities of transaction. 8M
   b) Why are tree-structured indexes good for searches? 6M

**OR**

10. a) What is locking and explain different types of locks? 7M
    b) What is indexing in data storage and how it is used in organization of data? 7M

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**R-17**

**Code: 7G133**

II B.Tech. I Semester Supplementary Examinations March 2021

# Digital Logic Design

( 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 )

*********

**UNIT–I**

1. a) Perform the following using 2's complement.
   i) 11010 – 1101 ii) 101011 – 100110 7M
   b) Obtain the truth table for the function F = XY + XY' + Y'Z 7M

**OR**

2. a) Convert the following numbers into decimals
   (i) $(B65F)_{16}$
   (ii) $(127.4)_8$
   (iii) $(4021.2)_5$
   (iv) $(1010110)_2$ 8M
   b) Expand A + BC'+ ABD'+ ABCD to MIN TERMS and MAX TERMS. 6M

**UNIT–II**

3. a) Implement Ex-OR gate using NOR gates. 7M
   b) Draw the multiple-level NAND circuit for the following expression:
   F= W (X + Y + Z) + XYZ 7M

**OR**

4. a) Show that the dual of the exclusive-OR is equal to its complement 7M
   b) Simplify the Boolean function using three variable map F(X, Y, Z) = ∑(0,1,5,7) 7M

**UNIT–III**

5. a) Define Decoder. Construct 3-to-8 Decoder using logic gates? 7M
   b) Implement a Full Adder with two 4 X 1 Multiplexers? 7M

**OR**

6. a) Explain about 3-bit Magnitude Comparator? 7M
   b) Design a Half-Subtractor with inputs x and y and outputs D and B. The circuit subtractor x-y and places the difference in D and the borrow in B? 7M

**UNIT–IV**

7. a) Convert a SR flip-flop to D type Flip-Flop? 7M
   b) Write difference between Combinational & Sequential circuits? 7M

**OR**

8. a) Explain with the help of neat diagram, the operation of 3-bit bidirectional shift register? 14M

**UNIT–V**

9. a) Draw and explain the operation of 4 bit ring counter? 7M
   b) What is ROM? List the different types of ROMs? 7M

**OR**

10. a) Draw and explain 4-bit Johnson counter using D-flip flop? 7M
    b) Implement the two Boolean functions with a PAL.
    F1(A,B,C) = ∑m (0,2,3,6), F2(A,B,C) = ∑m (1,2,5,6) 7M

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**R-17**

**Code: 7G134**

II B.Tech. I Semester Supplementary Examinations March 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 )

*********

## UNIT–I

1. a) Define Statement and Explain various Connectives with Example.

   b) Construct truth table for the following formula
   (P^Q)V(~P^~Q)V(P^~Q)

**OR**

2. a) Write Converse, Inverse and Contrapositive of the following statements.
   i) ~P->~Q
   ii) P->~Q

   b) Prove that (P->Q)^(R->Q)<=>(PVR)->Q by using substitution method.

## UNIT–II

3. State relation and explain properties of binary relations with examples.

**OR**

4. What is Hass diagram? Let X={2,3,6,12,24,36} and the relation ≤ on set X defined by x divides y then draw the Hass diagram.

## UNIT–III

5. Define Group, monoid, semigroups and subgroups with examples.

**OR**

6. a) Explain pigeonhole principle with example.

   b) A certain question paper contains 2 parts A and B each containing 4 questions. How many different ways a student can answer 5 questions by selecting at least 2 questions from each part?

## UNIT–IV

7. a) Find the generating function for the following sequence.
   i) $1^2,2^2,3^2,\ldots\ldots$ Ii) $1^3,2^3,3^3,\ldots$

   b) Find the coefficient of $x^{20}$ in $(x^3+x^4+x^5+\ldots\ldots)^5$

**OR**

8. Solve the recurrence relation using generating function. $a_n - 9a_{n-1} + 20a_{n-2} = 0$, for $n \geq 2$ and $a_0 = -3$ and $a_1 = -10$.

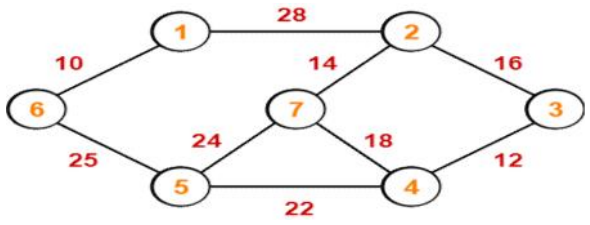
## UNIT–V

9. a) Define a graph and explain various representations of graph with examples.

   b) Define Planner graph with examples.

**OR**

10. Explain kruskals algorithm? .Find Minimum cost spanning tree cost for the following graph.

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**R-17**

**Code: 7GC32**

II B.Tech. I Semester Supplementary Examinations February 2021

# Engineering Mathematics-III

( Common to All Branches )

Max. Marks: 70 Time: 3 Hours

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

*********

## UNIT–I

1. a) Find the real root of equation $x^3 - x - 11 = 0$ by bisection method. 7M

   b) Using Taylor's series method, compute the value of y at x=0.2 from $\frac{dy}{dx} = x + y$; $y(0) = 1$. 7M

**OR**

2. a) Find a real root of the equation $3x = \cos x + 1$ by Newton-Raphson's method correct to four decimal places. 7M

   b) Given $\frac{dy}{dx} = \frac{y - x}{y + x}$ with initial condition $y = 1$ at $x = 0$. Find y for $x = 0.1$ by Euler's method. 7M

## UNIT–II

3. a) Using Newton's forward interpolation formula and the given table of values

| x | 1.1 | 1.3 | 1.5 | 1.7 | 1.9 |
|---|---|---|---|---|---|
| F(x) | 0.21 | 0.69 | 1.25 | 1.89 | 2.61 |

   Obtain the value of f(x) when x = 1.2 7M

   b) Find the first and second derivatives of the function tabulated below at the point x = 1.5

| x | 1.5 | 2.0 | 2.5 | 3.0 | 3.5 | 4.0 |
|---|---|---|---|---|---|---|
| y | 3.375 | 7.0 | 13.625 | 24.0 | 38.875 | 59.0 |

7M

**OR**

4. a) Evaluate f(10) given f(x) = 168, 192, 336 at x = 1, 7, 15 respectively. Use Lagrange interpolation. 7M

   b) Evaluate $\int_0^1 \frac{1}{1+x}\,dx$ by Simpson's 1/3 rule. 7M

## UNIT–III

5. a) By the method of least squares, find the straight line that best fits the following data.

| x | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| y | 14 | 27 | 40 | 55 | 68 |

7M

   b) Form the partial differential equation by eliminating the arbitrary constants $x^2 + y^2 + (z - c)^2 = a^2$ 7M

**OR**

6. a) Form the partial differential equations (by eliminating the arbitrary constants and arbitrary functions) from $z = f(x + a\,y) + g(x - a\,y)$ 7M

   b) Solve $p \tan x + q \tan y = \tan z$. 7M

**UNIT–IV**

7. a) Find the Fourier series expansion for $f(x) = ® - x$ in $0 < x < ®$ 7M

   b) Expand $f(x) = \cos x, 0 < x < ®$ in half range sine series. 7M

**OR**

8. Determine the Fourier series for $f(x) = x \sin x$ in the interval $0 < x < 2®$ 14M

**UNIT–V**

9. a) Find the finite Fourier sine and cosine Transforms of $f(x)$ defined by $f(x) = 1$ where $0 < x < ®$ 7M

   b) Find the Fourier sin and cosine transform of $f(x) = \frac{e^{-ax}}{x}, a > 0$ 7M

**OR**

10. Find the Fourier cosine transform of $f(x) = \frac{1}{1+x^2}$, hence, derive the Fourier sine transform of $¤(x) = \frac{x}{1+x^2}$ 14M

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**R-17**

**Code: 7G135**

II B.Tech. I Semester Supplementary Examinations March 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 ( 5 x 14 = 70 Marks )

*********

**UNIT–I**

1. a) Explain the structure of web document with example program
   b) What is URL and how URL is specified?

**OR**

2. How to create lists in HTML? What are the different types of Lists? Explain with an example program.

**UNIT–II**

3. a) How do you add a caption to a table in HTML? Explain with an example program.
   b) What is audio tag? Write any five audio tag attributes.

**OR**

4. What is image tag? Write a HTML program to resize an image and link the image to another page.

**UNIT–III**

5. a) Write about any Five CSS Selectors with examples.
   b) Write the Basic structure and Syntax of XML Document

**OR**

6. a) How XML Document is validated?
   b) How External DTD works? Explain with example program

**UNIT–IV**

7. What do you mean by looping? What are the types of looping statements available in java script?

**OR**

8. a) How to Add a Script to Your Pages. Explain with Example.
   b) How do you combine two variables in JavaScript? Explain with example program.

**UNIT–V**

9. a) How to add jQuery to a web page
   b) Differentiate Ajax with jQuery

**OR**

10. a) Name the jQuery method which is used to perform an asynchronous HTTP request?
    b) What is difference between JavaScript and jQuery?

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