Hall Ticket Number :										

R-17

Code: 7G134

II B.Tech. I Semester Supplementary Examinations Nov/Dec 2022

Discrete Mathematics

(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)

****

Marks

UNIT–I

1. a) Using Indirect method proof derive P→~S from set of premises P→(QVR), Q→~P, S→~R and P. 10M

   b) Find DNF for the following formula. ~(P→(Q^R)) 4M

OR

2. a) Define Statement and Explain various Connectives with Example. 7M

   b) Construct truth table for the following formula (P^Q)V(~P^~Q)V(P^~Q) 7M

UNIT–II

3. a) A={1,2,3,4,5,6,7,8,9,10,11,12}. R is defined by {(x,y)ϵ R iff (x-y) is a multiple of 5}.Find out partition of A induced by R. 10M

   b) Explain Bijective function with example. 4M

OR

4. a) Explain partition and covering of a set. 7M

   b) Let X={1,2,3,4,5} and R={<x,y>|x>y}.Draw the graph of R and also its matrix. 7M

UNIT–III

5. a) How many numbers can be formed using the digits 1, 3, 4, 5, 6, 8 and 9 if no repetitions are allowed? 7M

   b) Find the Coefficient of x^9y^3 in the expansion of $(2x-3y)^{12}$ 7M

OR

6. a) Explain pigeonhole principle with example. 7M

   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? 7M

UNIT–IV

7. a) Solve the recurrence relation $a_{n=}2(a_{n-1}-a_{n-2})$ for n>=2 with $a_0=1,a_1=2$ 6M

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

OR

8. Solve the recurrence relation $a_{n+2}-10a_{n+1}+21a_n=3n^2-2$, for n>=3 14M

UNIT–V

9. a) Explain DFS with example. 6M

   b) What is bipartite graph? Explain with an example. 8M

OR

10. a) Define the following terms with suitable examples.
    Euler Path ii) Euler Circuit iii) Hamiltonian cycle iv) Multigraph 8M

    b) Define a graph and explain various representations of graph with examples. 6M

***

Hall Ticket Number :										

R-17

Code: 7GC32

II B.Tech. I Semester Supplementary Examinations Nov/Dec 2022

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)

****

Marks

UNIT–I

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

   b) Using the bisection method, find a real root of the equation $\cos x = xe^x$ correct to three decimal places. 7M

OR

2. Solve $y' = y^2 + x, y(0) = 1.$ Using Taylor's series Method, Compute $y(0.1), y(0.2)$ and $y(0.3)$. 14M

UNIT–II

3. a) The following table of values of x and y is given.

x	0	1	2	3	4	5	6
y	6.9897	7.4036	7.7815	8.1291	8.4510	8.7506	9.0309

   Find $\frac{dy}{dx}$ *and* $\frac{d^2y}{dx^2}$ at x=6 7M

   b) Using Lagrange is interpolation formula find the value of $f(10)$ from the following table

x	5	6	9	11
y	12	13	14	16

7M

OR

4. Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at x=1.1 from the following table.

X	1.0	1.1	1.2	1.3	1.4	1.5	1.6
y	7.989	8.403	8.781	9.129	9.451	9.750	10.031

14M

UNIT–III

5. a) Fit a straight line $y = a + bx$ to the data by the method of least squares

x	0	1	3	6	8
y	1	3	2	5	4

7M

   b) Form the partial differential equation by eliminating a, b from $ax^2 + by^2 + z^2 = 1$ 7M

OR

6. a) Fit a curve $y = ae^{bx}$ to the following data by the method of least squares

x	0	1	2	3
y	1.05	2.10	3.85	8.30

7M

   b) Form a partial differential equation by eliminating the arbitrary functions from $z = f(x + at) + g(x - at)$. 7M

UNIT–IV

7. a) Express $f(x)=x$ as half range sine in $0<x<2$ 7M

   b) Find the Fourier series to represent $f(x)=\pi x$ in $0\le x\le 2$ 7M

OR

8. a) Obtain the Fourier series for $f(x)=\left(\frac{\pi-x}{2}\right)^2$ in $0<x<2\pi$ 7M

   b) Find the half range cosine series for $f(x)=x(2-x)$ in $0\le x\le 2$ and hence find prove that $\frac{1}{1^2}-\frac{1}{2^2}+\frac{1}{3^2}-\frac{1}{4^2}+\frac{1}{5^2}-\frac{1}{6^2}+\ldots=\frac{\pi^2}{12}$ 7M

UNIT–V

9. a) Find the Fourier cosine transform of $f(x)=\begin{cases} x, & 0<x<1 \\ 2-x, & 1<x<2 \\ 0, & x>2 \end{cases}$ 7M

   b) Find the finite Fourier sine and cosine transforms of $f(x)$ defined by

$$f(x)=\begin{cases} 1, & 0<x<\frac{\pi}{2} \\ -1, & \frac{\pi}{2}<x<\pi \end{cases}$$ 7M

OR

10. a) Find the Fourier sin and cosine transform of $f(x)=2e^{-5x}+5e^{-2x}$ 7M

    b) Find the Fourier Transform of $f(x)=\begin{cases} a^2-x^2, if\ |x|<a \\ 0 \ \ if \ \ |x|>a>0 \end{cases}$, and hence show that $\int_0^a \frac{\sin x-\cos x}{x^3}dx=\frac{\pi}{4}$. 7M

***

Hall Ticket Number :										

R-17

Code: 7G135

II B.Tech. I Semester Supplementary Examinations Nov/Dec 2022

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)

****

Marks

UNIT–I

1. a) Write any Five Text Formatting elements in HTML. 7M
   b) Explain the structure of web document with example program 7M

OR

2. a) Explain block-level elements in HTML with example 7M
   b) List the new features in HTML5 comparing with earlier versions. 7M

UNIT–II

3. a) What is focus in HTML form? 7M
   b) Describe basic table element and attributes with example 7M

OR

4. a) Write any five image tag attributes. 7M
   b) What is a nested table in HTML explain giving an example? 7M

UNIT–III

5. With an example, describe CSS style properties associated with text formatting. 14M

OR

6. a) How External DTD works? Explain with example program 7M
   b) How to set Multiple Backgrounds using CSS 7M

UNIT–IV

7. a) Discuss about different types of data types supported by java script. 7M
   b) Write a java script code to handle onsubmit and onload events. 7M

OR

8. a) How do you combine two variables in JavaScript? Explain with example program. 7M
   b) Write a java script to find sum of first n even numbers and display the result. Read the value of n from the user. 7M

UNIT–V

9. a) What is difference between JavaScript and jQuery? 7M
   b) Is jQuery front end or backend? Explain with example. 7M

OR

10. Name any five jQuery Events. Illustrate the usage of those events with an example. 14M

***

Hall Ticket Number :										

R-17

Code: 7G131

II B.Tech. I Semester Supplementary Examinations Nov/Dec 2022

Advanced Datastructures 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)

****

UNIT–I

1.	a)	How do you create a static member function? Explain with example	7M
	b)	What is friend function in C++? List the advantages of friend function?	7M

OR

2.	a)	Explain the basic principles of object oriented programming	7M
	b)	Define class? How the member functions can be defined with examples	7M

UNIT–II

3.	a)	What is template? Explain about function templates and class templates with suitable examples.	7M
	b)	What is hybrid inheritance? Write a program to illustrate the concept of Hybrid Inheritance.	7M

OR

4.		Define Constructor. Explain types of constructors with examples.	14M

UNIT–III

5.	a)	Define a Queue. List out any four applications of Queue.	7M
	b)	Discuss about linked implementation of queue ADT.	7M

OR

6.	a)	Explain dictionary as an ADT.	7M
	b)	How are insertions and deletions handled in a chained hash table? Explain.	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.	a)	Draw a B-Tree of degree 3 and explain.	6M
	b)	What is the role of Tries in pattern Matching? What are the different Tries? Explain Applications of Tries.	8M

OR

10.	a)	Illustrate Krunth-Morris-Pratt algorithm and what is failure function in it. Also mention its algorithm complexity.	8M
	b)	Create a Red-Black Tree by inserting the following sequence of numbers: 8, 18, 5, 15, 17, 25, 40 and 80.	6M

***

Hall Ticket Number :										

R-17

Code: 7G132

II B.Tech. I Semester Supplementary Examinations Nov/Dec 2022

Database Management Systems

(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)

****

Marks

UNIT–I

1. 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

OR

2. a) Explain the differences between File Systems and DBMS 4M
   b) Explain the different roles of database administrators, application programmers, and end users of a database. Who needs to know the most about database systems? 10M

UNIT–II

3. a) Distinguish strong entity set with weak entity set? Draw an ER diagram to illustrate weak entity set? 8M
   b) Explain the distinctions among the terms primary key, candidate key, and super key. 6M

OR

4. a) Draw ER diagram for the airport database incorporating all the ER notations with explanation. 8M
   b) Write Merits and Demerits of ER Modeling. 6M

UNIT–III

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

OR

6. a) Compare the stored procedures with stored functions? 7M
   b) What are Correlated Queries how they are applied in SQL? 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 Boyce-Codd normal form (BCNF). How does it differ from 3NF? Why is it considered a strong form of 3NF? 7M
   b) Give an example of a relation schema R and a set of dependencies such that R is in BCNF but is not in 4NF. 7M

UNIT–V

9. 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

OR

10. a) Illustrate concurrent execution of transaction with examples? 6M
    b) Discuss briefly about the dynamic index structure with one example? 8M

***

Hall Ticket Number :										

R-17

Code: 7G133

II B.Tech. I Semester Supplementary Examinations Nov/Dec 2022

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)

****

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) What is self-complementary code? Explain with the example 9M

   b) Explain about canonical and standard forms 5M

UNIT–II

3. Simplify the Boolean function
   F(A,B,C,D) = Σ(0,2,5,8,9,13,15) and DONT-CARE condition
   D(A,B,C,D) = Σ(1,7,14) 14M

OR

4. Obtained the Simplified Expression In sum of products for the following
   i) F(x,y,z) = Σ (2,3,6,7) ii) F(w,x,y,z) = Σ (2,3,12,13,14,15)
   iii) F(A,B,C,D)=Σ(4,6,7,15) 14M

UNIT–III

5. a) What is a Multiplexer? Explain it. 5M

   b) Construct 16x1 Multiplexer using 4x1 Multiplexers. 9M

OR

6. a) What is a combinational Circuit? Explain it. 7M

   b) Implement Full adder Combinational Circuit. 7M

UNIT–IV

7. a) Explain design procedure of synchronous sequential logic with an example? 7M

   b) Explain the steps involved in the process of state reduction and Assignment with an example? 7M

OR

8. a) Write difference between Combinational & Sequential circuits? 7M

   b) Elaborate about Shift Registers? 7M

UNIT–V

9. a) 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

   b) Realize the following Boolean function using PROM
   F (x, y, z, w) = Σm (0, 1, 3, 6, 8, 9, 15). 7M

OR

10. a) Show that a BCD ripple counter can be constructed using a 4-bit binary ripple counter with asynchronous clear and a NAND gate that detects the occurrence of count 1010. 7M

    b) Design a synchronous mod-6 counter using JK flip-flop.? 7M

***