

Hall Ticket Number :

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R-17

Code: 7G134

II B.Tech. I Semester Supplementary Examinations November 2023

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) Prove that $(P \rightarrow Q) \wedge (R \rightarrow Q) \Leftrightarrow (P \vee R) \rightarrow Q$ by using substitution method. 7M
b) Explain automatic theorem proving with example. 7M

OR

2. a) Define statement and explain various connectives with example. 7M
b) Define rules of inference. And Show that $R \rightarrow S$ can be derived from the premises $P \rightarrow (Q \rightarrow S)$, $\sim R \vee P$ and R . 7M

UNIT-II

3. State relation and explain properties of binary relations with examples. 14M

OR

4. a) Explain types of functions with examples. 7M
b) Draw the Hasse diagram for the positive divisors for 36. 7M

UNIT-III

5. a) Explain pigeonhole principle with example. 7M
b) How many different license plates are there that involve 1, 2 or 3 letters followed by 4 digits? 7M

OR

6. a) How many committees of 5 or more can be chosen from 9 people? 6M
b) Explain Binomial and multinomial theorems. 8M

UNIT-IV

7. a) How to solve Recurrence and Non Recurrence Relations. 7M
b) Find the generating function for the following sequence.
i) $1^2, 2^2, 3^2, \dots$
ii) $1^3, 2^3, 3^3, \dots$ 7M

OR

8. Find a generating function for the recurrence relation $a_{n+1} - a_n = 3^n$, $n \geq 0$, $a_0 = 1$. Find the general solution 14M

UNIT-V

9. a) Define Planner graph with examples. 5M
b) What is Hamiltonian graph? Explain with an example. 9M

OR

10. a) What is spanning tree? Write and explain Breadth First Search algorithm with example. 9M
b) What is Four-coloring problem? Explain with an example 5M

Important Note: 1. On completing your answers. Compulsorily draw diagonal cross line on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 32+8=40, will be treated as malpractice.

Hall Ticket Number :

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R-17

Code: 7GC32

II B.Tech. I Semester Supplementary Examinations November 2023

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) 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. Using R-K method of 4th order, solve $\frac{dy}{dx} = \frac{y^2 - x^2}{y^2 + x^2}$, $y(0) = 1$. Find $y(0.2)$, $y(0.4)$. 14M

UNIT-II

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

OR

4. A solid of revolution is formed by rotating about the x-axis, the area between the x-axis, the lines $x=0$ and $x=1$ and a curve through the points with the following co-ordinates:
- | | | | | | |
|---|--------|--------|--------|--------|--------|
| x | 0.00 | 0.25 | 0.5 | 0.75 | 1.00 |
| y | 1.0000 | 0.9896 | 0.9589 | 0.9089 | 0.8415 |
- Estimate the volume of the solid formed using Simpsons rule. 7M

UNIT-III

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

OR

6. 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 $z = ax + by + a^2 + b^2$ 7M

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UNIT-IV

7. a) Find the Fourier series expansion for $f(x) = f - x$ in $0 < x < 2f$ 7M
 b) Expand $f(x) = \cos x, 0 < x < f$ in half range sine series. 7M

OR

8. Express $f(x) = x$ as half range sine and cosine in $0 < x < 2$ 14M

UNIT-V

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

OR

10. Find the Fourier transform of $f(x) = \begin{cases} 1-x^2, & |x| \leq 1 \\ 0, & |x| \geq 1 \end{cases}$.

Hence evaluate $\int_0^{\infty} \frac{x \cos x - \sin x}{x^3} \cos \frac{x}{2} dx$

14M

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R-17

Code: 7G135

II B.Tech. I Semester Supplementary Examinations November 2023

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)

UNIT-I

- | | |
|---|----|
| 1. a) What is URL and how URL is specified? | 7M |
| b) Write any Five Text Formatting elements in HTML. | 7M |

OR

- | | |
|---|----|
| 2. a) Explain block-level elements in HTML with example | 7M |
| b) Explain the inline elements in HTML with example | 7M |

UNIT-II

- | | |
|---|----|
| 3. a) What is audio tag? Write any five audio tag attributes. | 7M |
| b) What is Accessible Tables in html | 7M |

OR

- | | |
|---|----|
| 4. a) Write any five image tag attributes. | 7M |
| b) How do I make my HTML control read only? | 7M |

UNIT-III

- | | |
|--|----|
| 5. a) How External DTD works? Explain with example program | 7M |
| b) How to set Multiple Backgrounds using CSS | 7M |

OR

- | | |
|---|-----|
| 6. Explain about different types of CSS with example programs | 14M |
|---|-----|

UNIT-IV

- | | |
|--|----|
| 7. a) What is JavaScript console? How do I fix JavaScript console error? | 7M |
| b) How to create an external JavaScript file? Explain. | 7M |

OR

- | | |
|---|----|
| 8. 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 |

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. a) What is jQuery UI? Explain. | 7M |
| b) What is selector in jQuery? Explain with an example? | 7M |

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R-17

Code: 7G133

II B.Tech. I Semester Supplementary Examinations November 2023

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) Obtain the truth table for the function $F = XY + XY' + Y'Z$ 7M
- b) Expand $A + BC' + ABD' + ABCD$ to MIN TERMS and MAX TERMS. 7M

OR

- 2. a) Demonstrate n's complement and n-1's complement of a number? Explain it with an example? 7M
- b) Express the following functions as a sum of min terms and as a product of max terms:
 $F(A,B,C) = B'C + A'C + BC$ 7M

UNIT-II

- 3. a) Implement Ex-OR gate using NOR gates. 7M
- b) Simplify the Boolean function using three variable map $F(X, Y, Z) = \sum(0,1,5,7)$ 7M

OR

- 4. a) Show that the dual of the exclusive-OR is equal to its complement 7M
- b) Implement the following Boolean expression with exclusive-OR and AND gates:
 $F = AB'CD' + A'BCD' + AB'CD + A'BC'D$ 7M

UNIT-III

- 5. a) Explain the functionality of a Multiplexer along with applications? 7M
- b) Define Decoder. Construct 3-to-8 Decoder using logic gates? 7M

OR

- 6. a) Design and implement 4-bit Priority Encoder? 7M
- b) Design 4-bit binary to Gray code converter? 7M

UNIT-IV

- 7. a) Write difference between Combinational & Sequential circuits? 7M
- b) Elaborate about Shift Registers? 7M

OR

- 8. a) With a neat diagram, explain master slave JK Flip-Flop? 7M
- b) Draw the circuit diagram of S-R Flip-Flop with NAND gates and explain its operation with the help of a truth table? 7M

UNIT-V

- 9. a) Explain about Hamming code? 7M
- b) Describe about Error detection and correction methods used in logic circuits? 7M

OR

- 10. a) Elaborate Random access memory and its types with examples? 7M
- b) Draw and explain 4-bit Johnson counter using D-flip flop? 7M
