

TB253228Z

Reg. No :

Name :

BACHELOR'S DEGREE EXAMINATION, OCTOBER 2025
2024 ADMISSIONS REGULAR
SEMESTER III - MINOR - (MATHEMATICS)
MT3DSCB102B24 - Computational Mathematics

Time : 1.5 Hours

Maximum Marks : 50

Part A

Answer all questions. Each question carries 1 mark.

(1x10=10)

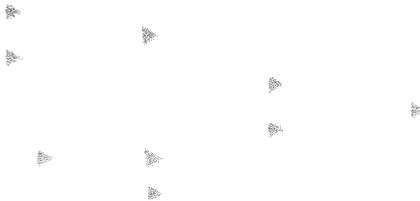
1. Find the dual of the Boolean expression $XY + X \cdot 0 + \bar{X} \cdot 1$ [CO1,Analyse]
2. How many different Boolean functions of degree n are there? [CO1,Analyse]
3. Translate $1 \cdot 0 + \overline{(0 + 1)} = 0$ into a logical equivalence. [CO1,Analyse]
4. For the given coding scheme a: 001, b: 0001, e: 1, r: 0000, s: 0100, t: 011, x: 01010, find the word represented by 000110010100011 [CO2,Apply]
5. How many vertices does a full 5-ary tree with 100 internal vertices have? [CO2,Apply]
6. Write the post order traversal algorithm. [CO2,Apply]
7. How many edges must be removed from a connected graph with n vertices and m edges to produce a spanning tree? [CO3,Apply]
8. How many different spanning trees are there for a circuit with 5 vertices? [CO3,Apply]
9. Explain spanning tree. [CO3,Apply]
10. Define linear programming. [CO4,Apply]

Part B

Answer any 2 questions from the bunch of CO1. Each question carries 5 mark.

(5x2=10)

11. Establish absorption law $x(x+y)=x$ using the other identities of Boolean Algebra. [CO1,Analyse]
12. Find the output of the given circuit [CO1,Analyse]



13. Establish absorption law $x+xy = x$ using the other identities of Boolean Algebra. [CO1,Analyse]

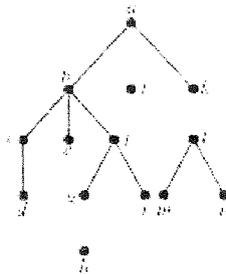
Part B

Answer any 2 questions from the bunch of CO2. Each question carries 5 mark.

(5x2=10)

14. Explain the following terms (i) Simple graphs (ii) Multigraphs (iii) Directed graphs (iv) Pseudographs (v) Mixed graphs. [CO2,Apply]
15. What is the postfix form of the expression $((x + y) \uparrow 2) + ((x - 4) / 3)$? [CO2,Apply]

16. Find the level of each vertex in the rooted tree shown in the figure. What is the height of the rooted tree? Is this tree



balanced? Justify your answer.

[CO2,Apply]

Part B

Answer any 2 questions from the bunch of CO3. Each question carries 5 mark.

(5x2=10)

17. Differentiate between the algorithms of depth-first and breadth-first search method.

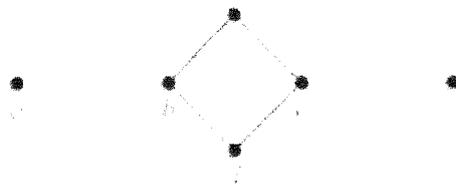
[CO3,Apply]

18. Use depth-first search to find the spanning trees for K_5 .

[CO3,Apply]

19. Draw all spanning trees of the given graph

[CO3,Apply]



Part C

Answer any 1 question from the bunch of CO4. Each question carries 10 mark.

(10x1=10)

20. Solve graphically Minimize $Z=3x+2y$ subject to $5x+y \geq 10$, $x+y \geq 6$, $x+4y \geq 12$; $x, y \geq 0$. Find the optimum value.

[CO4,Apply]

21. Solve the following LPP using Dual **Simplex Method** Minimize $5x_1+6x_2$ subject to $x_1+x_2 \geq 2$, $4x_1+x_2 \geq 4$; $x_1, x_2 \geq 0$

[CO4,Apply]