

Name of Student: Abhinav John

Roll No: 20MCA301



TKM COLLEGE OF ENGINEERING, KOLLAM-5
Department of Computer Applications
III Semester MCA
Internal Assessment (Series Test-II) Feb 2022
Course with Code: 20MCA203 Design and Analysis of Algorithms

Time: 2Hrs

Maximum Marks: 50

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Qn. No.	PART – A Answer all questions	Marks	BL	CO																		
1	Explain about control abstraction of backtracking technique.	3	L1	3																		
2	Apply backtracking technique to solve the following instance of Subset Sum problem where $w=\{2,3,4,6,10\}$ and $d=12$.	3	L2	3																		
3	Explain the notion of decision tree method in lower bound complexity.	3	L1	3																		
4	Explain control abstraction of branch and bound technique.	3	L1	3																		
5	Differentiate class P and NP in complexity theory.	3	L1	4																		
6	Compare deterministic and non deterministic algorithms.	3	L1	4																		
7	Discuss about Polynomial time reduction in Np Hard problems	3	L1	4																		
8	Define the term network flow with an example.	3	L1	4																		
9	Explain residual graph in network flow.	3	L1	4																		
10	Explain bipartite graph and its matching with suitable diagram	3	L1	4																		
PART – B																						
MODULE-3																						
11 a.	Explain N Queens problem and analyse the solution based on algorithm.	5	L2	3																		
OR																						
b.	Given a 3×3 board with 8 tiles (every tile has one number from 1 to 8) and one empty space. The objective is to place the numbers on tiles to match and find the final configuration using the empty space. (You can slide four adjacent (left, right, above, and below) tiles into the empty space). <div><div>Initial configuration</div><div><table><tr><td>1</td><td>2</td><td>3</td></tr><tr><td>5</td><td>6</td><td></td></tr><tr><td>7</td><td>8</td><td>4</td></tr></table></div><div>Final configuration</div><div><table><tr><td>1</td><td>2</td><td>3</td></tr><tr><td>5</td><td>8</td><td>6</td></tr><tr><td>7</td><td>4</td><td></td></tr></table></div></div> <div>→</div>	1	2	3	5	6		7	8	4	1	2	3	5	8	6	7	4		5	L2	3
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12 a.	MODULE-3 Prove that binary or any search has a lower bound complexity of $\Omega(\log n)$.	5	L2	3
b.	OR Prove that any comparison based sorting has a lower bound complexity of $\Omega(n \log n)$.	5	L2	3
13 a.	MODULE-4 a) Prove that Clique is NP complete. OR b) Prove that Vertex cover is NP Complete.	5	L2	4
14 a	MODULE-4 Explain Max-Min cut theorem in ford fulkerson algorithm using suitable example.	5	L2	4
b)	OR Describe the procedure and find maximum flow through the given network using ford fulkerson algorithm.	5	L2	4

