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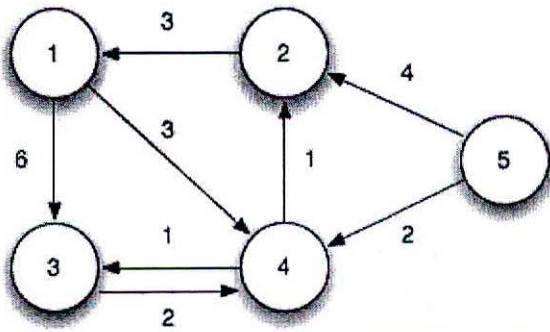
Q. No.	Questions	Max. Marks	CO-BL
Q1			
A)	Find the bounding function and complexity of following code.	16	1-3

	1.
	```c void function(int n) { int count = 0; for(int i=n/4; i<=n; i++) for(int j=1; j<=n; j=3*j) for(int k=1;k<=n; k=k*3) count++; } ```
	 2.
	```c void function(int n) { int count = 0; for(int i=0; i<n; i++) for(int j=i; j<i*i;j++) if (j%i == 0) {for(int k=0;k<j;k++) printf("*"); } } ```		

	3.
	```c void function(int n) { int count = 0; for(int i=1; i<=n; i++) for(int j=1; j<=n; j++) for(int k=i;k<=n/2;k++) count++; } ```
	 4.
	```c while(n>1) { n=n/2 stmt } ```		

B)	Apply merge sort algorithm on array A = (10 1 52 8 6 13 20 3 50 69) Show all the iterations. OR Write quick sort algorithm and find its complexity.	4	2-3
Q2 A)	Consider sum of subset problem defined on the following set A={1,2,3,5,7,9}. Solve the problem using backtracking technique and dynamic method. Analyze and compare both the methods.	10	3-4 4-4
B)	Draw the portion of state space tree generated by recursive backtracking	10	3-3

	algorithm for 4-Queen problem with an example.3-			
Q3 A	Consider start state for a 15 puzzle problem as shown in table below. Show three levels of branching using branch and bound states with justification. (show the various Queues for -live node, E node, dead node)	10	4-3

1	2	3	
4	5	6	8
7	9	10	12
11	13	15	14

B)	Write Kruskal's algorithm for minimum spanning tree. Analyze the algorithm. **OR** Find minimum Spanning Tree for following graph using Kruskals's algorithm.	10	4-4 4-3

Q 4 A	i) Compare Greedy and Dynamic programing techniques (Definition, Working, Performance, Analysis, Example)	6	3-4
	ii) Build the Finite automata for pattern matching in the document. (Pattern : SSPPIT)	4	Self study
B)	Given a chain of four matrices A1,A2,A3,A4 with P=[4 6 3 4 5] Find matrix M. Also preserve the order of multiplication.	10	3-3
Q 5 A	Find the shortest path distance between every pair of vertices using Floyd Warshall Algorithm.	10	4-3

| **B)** | Find maxflow in the network. (source: S, Sink : T) | **10** | **4-3** |