**VIDYA JYOTHI INSTITUTE OF TECHNOLOGY**

DEPARTMENT OF CSE

**SUB: DESIGN & ANALYSIS OF ALGORITMS CLASS:II B.TECH SEM-II**

**LONG & SHORT QUESTIONS**

**UNIT-I**

**PART –A(Short Answer Questions)**

1. What is an algorithm? Explain the Algorithm criteria?
2. Write the pseudo code conventions for algorithms?
3. find the lower bound of 100n+3?
4. What is space complexity?
5. What is time complexity?
6. What is Big Oh (O) notation ?explain with example?
7. What is Big omega(Ω) notation? explain with example?
8. What is Theta (Θ) notation explain with example?
9. What is Little Oh (o) notation ?explain with example?
10. What is Little omega (ω) notation ?explain with example?
11. Write the general method for Divide and conquer?
12. Write the binary search algorithm?
13. What is strassen’s matrix multiplication?
14. Find the time complexity of quick sort?
15. Find the time complexity of testing prime number?
16. Find the time complexity of recursive function for factorial?
17. Find the time complexity of addition of two matrices?
18. Write algorithm for simple union operations.
19. . write algorithm for Collapsing find operation
20. Write an algorithm for weighted union operation.

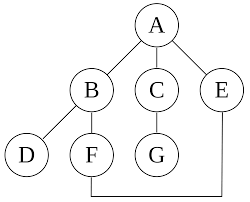
**PART-B(Long Answer Questions)**

1. Define Algorithm. Explain the Properties of an algorithm.
2. Explain the performance analysis of an algorithm with examples?
3. Derive time complexity of binary search algorithm and explain with example?
4. Write quick sort algorithm and explain with an example?
5. Derive the time complexity for strassen’s matrix multiplication?

**UNIT-II**

**PART –A(Short Answer Questions)**

1) find the DFS of the following graph

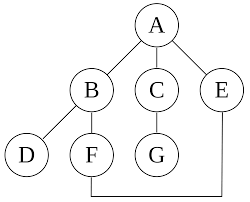


2) What is spanning tree explain with an example?

3) What is connected component?

4) What are bi-connected components?

5) Find the BFS of the following graph



6) Write the DFS Algorithm?

7) Write the BFS Algorithm?

8) Differentiate between DFS and BFS

9) Define articulation point of a graph.

10) Define feasible and optimal solutions?

11) Write the general method of greedy method?

12) What are the applications of greedy method?

13) Write an algorithm to find articulation point

14) Define the job sequencing problem with deadlines?

15) What is knapsack problem?

16) What is minimum spanning tree explain with example?

17) Define Connected graph.

18) Write the differences between Greedy algorithm and divide and conquer algorithm?

19) Define the optimal storage problem.

20) What are the applications of Single Source shortest path.

**PART-B(Long Answer Questions)**

21) Explain Breadth First Search with Example. and Write the algorithm for BFS And analyze its time complexity.

22) Find the optimal solution of the Knapsack instance n=7 M=15 (p1,p2,….,p7)=(10,5,15,7,6,18,3)and (w1,w2,….,w7)=(2,3,5,7,1,4,1)

23) Write the Prims algorithm?

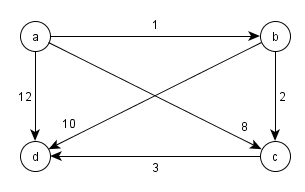
24) Write an algorithm for job sequencing?

25) Explain Depth first search of a graph with example? And write the algorithm for DFS and anlyze its time complexity

**UNIT-III**

**PART-A(Short Answer Questions)**

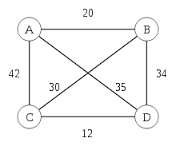
1. Write the general method for dynamic programming?
2. Write the differences between Greedy algorithm and Dynamic programming?
3. Write the differences between Dynamic Programming and divide and conquer algorithm?
4. What is the principle of the optimality? Explain with suitable example?
5. Explain the travelling sales person problem?
6. Write Algorithm for All Pairs shortest path problem?
7. Obtain all pair shortest paths for the following graph?



1. Write any two properties of Dynamic programming approach?
2. Write the Purging rule of 0/1 knapsack rule?
3. Write short notes on reliability design?
4. Write the differences between kruskals and Prims algorithm
5. What is travelling sales person problem?
6. Write the applications of Dynamic Programming?
7. Define the OBST Problem.
8. Define Matrix Multiplication Problem.
9. Write the difference between greedy Knapsack Problem and dynamic programming knapsack problem.
10. Define merging rule for 0/1 Knapsack problem.
11. Write an algorithm for all pairs shortest path problem.
12. Can Tsp can be solved by divide and conquer? Explain.
13. Write the Mathematical formulation in reliability design.

**PART-B(Long Answer Questions)**

1. Construct OBST for the following data n=4 (a1,a2,a3,a4)=(do,if,int,while) p(1:4)=(3,3,1,1) q(0:4)=(2,3,1,1,1)
2. Explain Matrix chain Multiplication problem with example.
3. For the following graph obtain the optimum cost tour(TSP using Dynamic programming)



1. Explain in detail Matrix chain multiplication algorithm.
2. Write in briefly Reliability design.