15527

Reg. No. | | | | | | | | |

V Semester B.C.A. Degree Examination, March/April - 2022

COMPUTER SCIENCE

Analysis and Design of Algorithm

Paper : BCA 504T

(CBCS Scheme)

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

Answer all sections.

SECTION - A

I. Answer any **Ten** questions. **(10×2=20)**

1. Define Algorithm. Mention the characteristics of algorithm.
2. Distinguish between Debugging and profiling.
3. State the different efficiency classes.
4. Define Knapsack problem.
5. What is minimum cost spanning tree?
6. Define subgraph with an example.
7. How graph can be represented using adjacency matrix? Give an example.
8. What is flow shop scheduling?
9. Define complete Binary tree with an example.
10. What is Back tracking?
11. What is Graph coloring problem?
12. Define Hamiltonian cycle.

SECTION - B

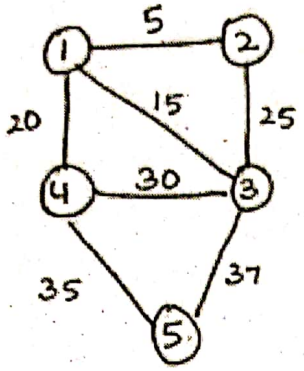
(5×10=50)

II. Answer any **Five** questions.

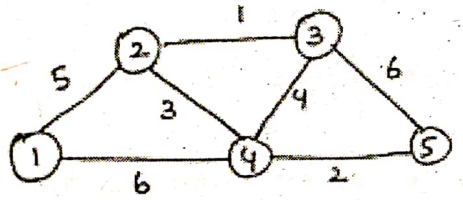
13. a. Explain time and space complexity of an algorithm with an example. **(5)**
    b. Explain different control structures. **(5)**
14. a. Write a recursive algorithm for binary search method. Derive its time complexity. **(5)**
    b. Trace the merge sort algorithm for the data : 40, 80, 10, 50, 30, 20, 70, 60. **(5)**

[P.T.O.

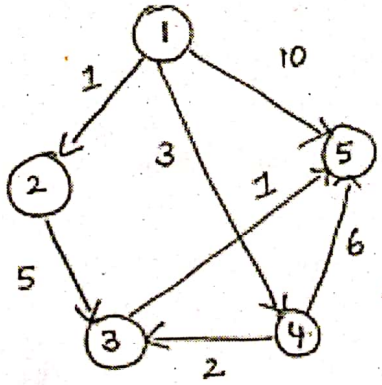
15. a. Apply Prim's algorithm for the following graph. (5)



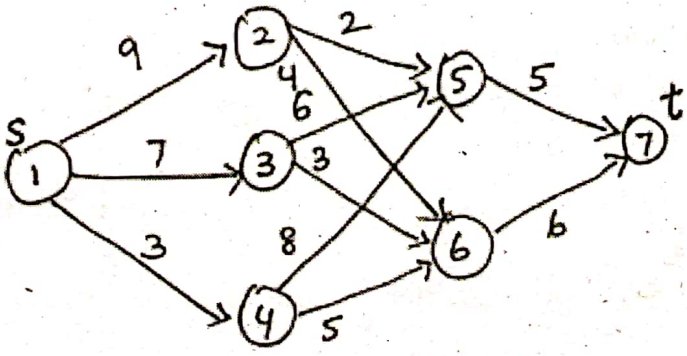
b. Find minimum weight spanning tree by kruskal's algorithm. (5)



16. Write the Dijkstra's Algorithm and find the shortest path from node 1 to all other nodes. (10)



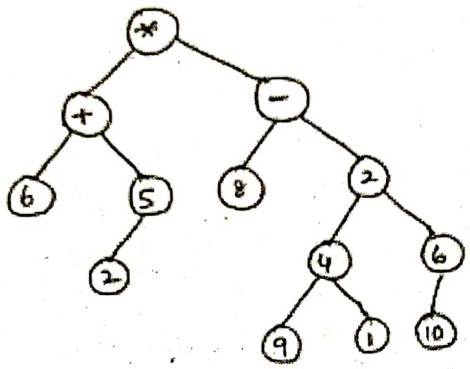
17. Find the minimum cost path from S to t in the multistage graph using forward approach. (10)



18. a. Draw and explain the state space tree for graph coloring when n = 3, m =3 (n is a number of vertices and m is number of colors).

b. Write a program to sort an array using Quick sort technique. State its efficiency.

19. a. Define Tree. Traverse the following tree in preorder, postorder and in order. **(6)**



b. Write a short notes on 4-Queen's problem. **(4)**

20. Consider the graph starting at vertex a. Traverse the graph by DFS and BFS. Draw the DFS and BFS spanning trees.