Nagarjuna Degree College
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15527

Reg. No.

V Semester B.C.A Degree Examination, March/April - 2023

COMPUTER APPLICATIONS

Analysis and Design of Algorithm

(CBCS Scheme)

Paper : BCA 504T

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

Instructions to Candidates:

Answer all Sections.

SECTION - A

Answer any TEN questions. Each question carries 2 marks. (10×2=20)

1. Define algorithm.
2. Define space complexity and time complexity.
3. What is operation count? Give one example.
4. Write control abstraction for divide and conquer technique.
5. Arrange the following complexities in ascending order

   O(n!), O (log n), O (n^3), O (n logn), O (n^2).
6. What is sorting? Write the time complexity of merge sort algorithm.
7. What is an optimal solution?
8. Define binary tree. Give one example.
9. What are directed and indirected graph? Give one example for each.
10. What is sum of subset problem? Give an example.
11. What is backtracking?
12. What is graph coloring?

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SECTION - B

Answer any Five questions. Each question carries 10 marks. (5×10=50)

13. a) Explain the different control structures. (5)

    b) What is structured programming ? What are the advantages of structured programming. (5)

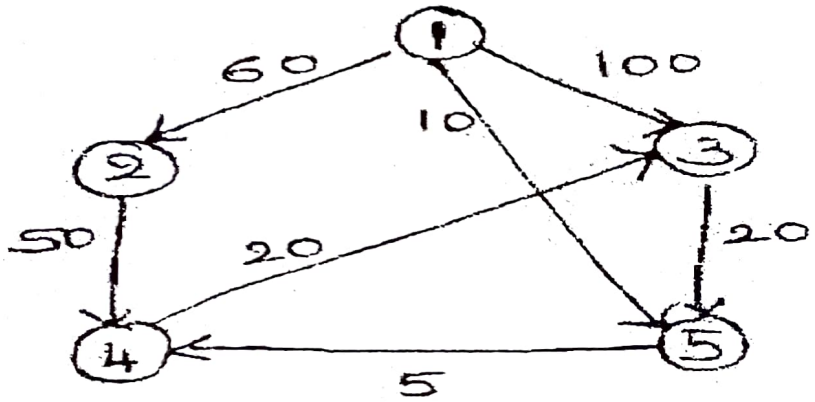
14. a) Write an algorithm to find the maximum and minimum of a list of numbers using divide and conquer technique. (5)

    b) Explain quick sort algorithm with an example. (5)

15. a) Explain optimal storage of tapes with an example. (5)

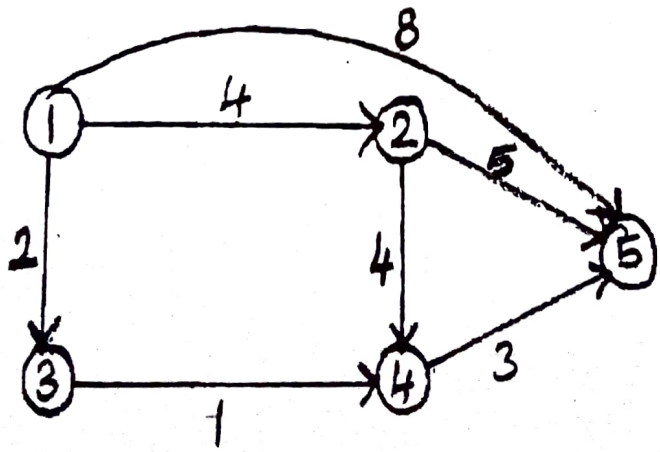
    b) Explain 0/1 Knapsack problem with an example. (5)

16. Find the shortest path from node 1 to all other nodes using Dijkstra's algorithm. (10)



17. Explain travelling salesman problem with an example. (10)

18. Write Dijkstra's algorithm and find shortest path from node 1 to all other nodes. (10)



19. a) Explain Pre-order, In-order, Post-Order tree traversal with an example. (5)

b) Explain 4-queen's problem using backtracking. (5)

20. Find the minimum cost path from node 1 to node 12 for the below multistage graph using backward approach. (10)