44673/C0230

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

III Semester B.C.A.5 Degree (CBCS) Examination, April - 2023
DESIGN AND ANALYSIS OF ALGORITHM (Theory)
(Repeaters)

Time : 3 Hours **Maximum Marks : 80**

Instructions to Candidates :

1. *All **three** sections are compulsory.*
2. *Draw diagrams wherever necessary.*

SECTION - A

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

1. a) Define algorithm.

b) Write a pseudo code convention for while loop.

c) Define space and time complexity of an algorithm.

d) Define divide and conquer method.

e) Write the differences between straight maxmin and recursive maxmin algorithm.

f) Define feasible and optimal solution.

g) Differentiate between dynamic programming and greedy method.

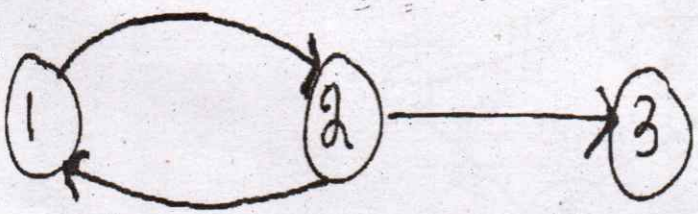
h) What do you mean by two way merge pattern?

i) Define tree traversal.

j) Differentiate between directed graph and undirected graph, with neat diagram.

k) Define Hamiltonian cycle.

l) For the given graph, state the in degree and out degree of node 1 and 2.



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SECTION - B

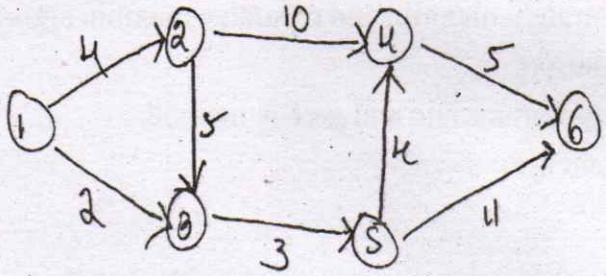
Answer any **four** questions. **(4×5=20)**

2. Explain characteristics of an algorithm.
3. Explain asymptotic notations.
4. Explain Binary search algorithm in detail.
5. Using the greedy knapsack algorithm find optimal solution for following, n = 7, m = 20
   $(P_1$ to $P_7) = (10,5,15,7,6,18,3)$
   $(W_1$ to $W_7) = (2,3,5,7,1,4,1)$.
6. Write a algorithm to find all pairs of shortest path.
7. Write a note on sum of sub set problem.

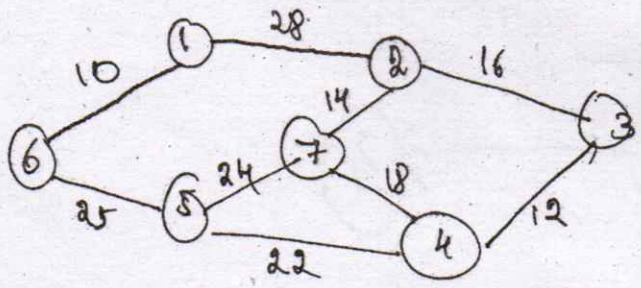
SECTION - C

Answer any **four** full questions. **(4×10=40)**

8. Explain the various pseudo code conventions for specifying algorithm. **(4+6)**
9. a) Write a note on strassen's matrix multiplication.
   b) Sort the following array using quick sort a{1:8} 5,3,1,4,8,2,9,7.
10. a) Find shortest path and its length from source vertex 1 to all the destinations for the given graph.



b) Find the minimum cost spanning tree using prims algorithm.



11. a) Write a note on 4×4 queen's problem.

    b) Write a note on travelling sales man problem.

12. Write a short notes on any **two** of the following.

    a) Breadth First Search (BFS).

    b) Depth First Search (DFS).

    c) Backtracking.

    d) N-queen problem.