

PE-274-CV-19
M.Sc. COMPUTER SCIENCE (2nd Semester)
Examination, June 2022
ANALYSIS AND DESIGN OF ALGORITHM

Time : Three Hours]

[Maximum Marks : 80
[Minimum Pass Marks : 29

Note : Answer from both the Sections as directed. The figures in the right-hand margin indicate marks.

Section-A

1. Answer the following short answer questions: 1x10=10
- (a) -----complexity of an algorithm is the amount of computer time it needs to run to completion.
 - (b) The definition of omega notation is: “f of n is omega of g of n” iff there exists positive constants c and no Such that $f(n) \geq c * g(n)$ for all n. $n \geq n_0$. True/False
 - (c) -----searching method uses divide and conquer algorithm.
 - (d) Average case time complexity of merge sort is-----.
 - (e) Hamiltonian path is NP complete? (True/False)
 - (f) Rabin kapp algorithm has worst case time complexity-----.
 - (g) -----Algorithm is the best approach for solving the Huffman codes problem since it greedily searches for an optimal solution.
 - (h) Prim’s algorithm initializes with a vertex. (True/False)
 - (i) Branch and bound method can be used to solve 0/1 knapsack problem. (True/False)
 - (j) A greedy algorithm can be used to solve all the dynamic programming problems. (True/False)

2. Answer the following short type questions: 2x5=10
- (a) Define Big “oh”
 - (b) Define string matching.
 - (c) What do you understand by directed and undirected graph?
 - (d) What do you mean by greedy algorithm?
 - (e) Define Bellman ford’s algorithm.

Section-B

12x5=60

Answer the following Long-Answer questions:

UNIT-I

3. Explain master method with suitable example.

OR

Explain the method for analyzing an algorithm. Differentiate between best case and worst case.

UNIT-II

4. Explain min-max problem with suitable example and analyses it.

OR

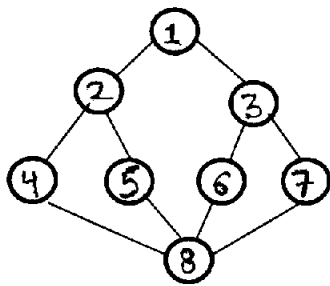
What are NP, P, NP-complete and NP-Hard problems?

UNIT-III

5. Explain string matching with finite automata.

OR

Explain depth first search algorithm find depth first search for the graph given below.

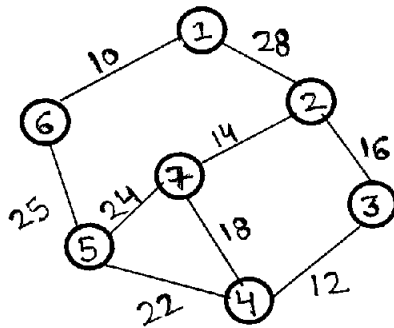


UNIT-IV

6. Differentiate between Dijkstra algorithm and Bellman ford algorithm.

OR

Explain prim's algorithm and find minimum spanning tree for the graph given below:



UNIT-V

7. Write short notes on:

- a). $0/1$ Knapsack problem
- b). Backtracking