GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

R4A19001192

Registration No: | | | | | | | | | | |

Total Number of Pages : 2 B.TECH

4th Semester Regular Examination-April-May 2019

BITPC4010 Design and Analysis of Algorithm

(Regulations 2017) IT Branch .

Time : 3 Hours Maximum : 100 Marks

Answer ALL Questions

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions) 10 x 2=20 Mark

Q.1. Answer *All* Questions.

a Two main measures for the efficiency of an algorithm are [CO1] [PO1]
1) Processor and memory
2) Complexity and capacity
3) Time and space
4) Data and space

b When determining the efficiency of algorithm, the time factor is measured by [CO1] [PO1]
1) Counting microseconds
2) Counting the number of key operations
3) Counting the number of statements
4) Counting the kilobytes of algorithm

c An algorithm that calls itself directly or indirectly is known as [CO1] [PO1]
1) Sub algorithm
2) Recursion
3) Polish notation
4) Traversal algorithm

d The complexity of merge sort algorithm is [CO2] [PO1]
1) O(n) 2) O(log n) 3) O(n2) 4) O(n log n)

e The complexity of Binary search algorithm is [CO2] [PO1]
1) O(n) 2) O(log) 3) O(n2) 4) O(n log n)

f Which of the following is/are property/properties of a dynamic programming problem? [CO3] [PO2]
1) Optimal substructure 2) Overlapping subproblems
3) Greedy approach 4) Both optimal substructure and overlapping subproblems

g the total running time of matrix chain multiplication of n matrices [CO2] [PO1]
1) Θ (n4) 2) Θ (n3) 3) Θ (n2) 4) Θ (n)

h The Data structure used in standard implementation of Breadth First Search is? [CO2] [PO1]
1) Stack 2) Queue 3) Linked List 4) None of the mentioned

i What is the type of the algorithm used in solving the 8 Queens problem? [CO2] [PO2]
1) Greedy 2) Dynamic 3) Branch and Bound 4) Backtracking.

j Choose the correct answer for the following statements: [CO2] [PO1]
I. The theory of NP–completeness provides a method of obtaining a polynomial time for NPalgorithms.
II. All NP-complete problem are NP-Hard.
1) I is FALSE and II is TRUE
2) I is TRUE and II is FALSE
3) Both are TRUE
4) Both are FALSE

PART – B: (Short Answer Questions) 10x2=20 Marks

Q.2. Answer *ALL* questions

a	Define Algorithm	[CO1] [PO1]
b	Define divide and conquer technique	[CO2] [PO1]
c	Define heap sort	[CO2] [PO1]
d	What are the elements of dynamic programming?	[CO2] [PO1]
e	Define principle of optimality?	[CO2] [PO2]
f	Define backtracking.	[CO2] [PO2]
g	What is state space tree?	[CO3] [PO1]
h	Define in-order, pre-order and post-order.	[CO2] [PO2]
i	What is the use of branch and bound method?	[CO3] [PO2]
j	Define Traveling Salesman Problem.	[CO3] [PO2]

PART – C: (Long Answer Questions) 4x15=60 Marks

Answer *ALL* questions

Q.3			
a	What are the characteristics of algorithm? Explain.	7	[CO1] [PO1]
b	What is time complexity and space complexity? Explain	8	[CO1] [PO1]
	OR		
c	What are the Asymptotic notations? Explain with example.	7	[CO1] [PO1]
d	Explain how to calculate run time of algorithm with example	8	[CO1] [PO1]
Q.4			
a	Explain quick sort with algorithm	7	[CO2] [PO1]
b	Discuss about merge sort with example	8	[CO2] [PO1]
	OR		
c	Write binary search algorithm and explain it with an example.	7	[CO2] [PO1]
d	Write a knapsack problem algorithm and explain it with example.	8	[CO2] [PO1]
Q.5			
a	Explain Graph representations with examples	7	[CO2] [PO1]
b	What is minimum spanning tree? Explain the kruskal method with example.	8	[CO3] [PO2]
	OR		
c	Write short notes on DFS and BFS	7	[CO2] [PO1]
d	Define problem of single source shortest path. Explain with example	8	[CO3] [PO2]
Q.6			
a	Consider a set S={5,10,12,13,15,18} and d=30.Solve it for obtaining sum of subset.	7	[CO3] [PO2]
b	Write short notes on 8-queens problem	8	[CO3] [PO2]
	OR		
c	Discuss about NP Complete problem	7	[CO3] [PO2]
d	Write short notes on vertex Cover Problem	8	[CO2] [PO1]

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