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Total No. of Pages: 02

IVth SEMESTER

END SEMESTER EXAMINATION

CO208   ALGORITHM DESIGN AND ANALYSIS

Time: 3:00 Hours

Roll No. ... ...

B.Tech. (CSE)

SEPT-2019

Max. Marks: 50

Note: Attempt any 5 questions. All questions carry equal marks.
Assume suitable missing data, if any.

Q1. (a) For each of the following recurrence sole them with the help of master theorem?   [3X2=6]

(i) $T(n) = 3T\left(\frac{n}{2}\right) + n^2$

(ii) $T(n) = 16T\left(\frac{n}{4}\right) + n$

(b) Solve $T(n) = 7T\left(\frac{n}{3}\right) + n^2$ with the help of recursion tree method. Show each and every step involved.   [4 marks]

Q2. (a) Write quick sort algorithm. Drive worst case and best case complexity for this algorithm.   [5 marks]

(b) Write down recursive binary-search algorithm and apply the same to find the value 2 in the following array. Array is as follows 1,2,3,4,5,6,7,8,9,10.   [5 marks]

Q3.   (a)   Determine LCS of <A,B,B,A,B,A,B,A> and <B,A,B,A,A,B,A,A,B>using dynamic programming. Write algorithm and runtime complexity for the same?   [5 marks]

(b) Solve travelling salesman by applying dynamic programming for the given graph?   [5 marks]
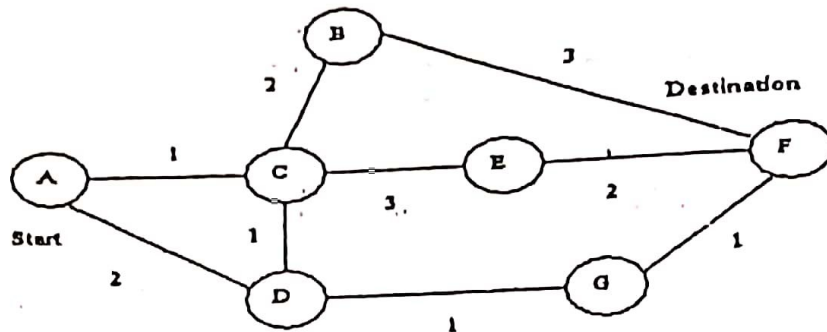
Q4: (a) Define backtracking phenomenon? Write the pseudo code for solving n-queen problem with the help of back tracking   [5 marks]
                    [5. marks]

(b) Define the following:

1. FIFO Branch and Bound
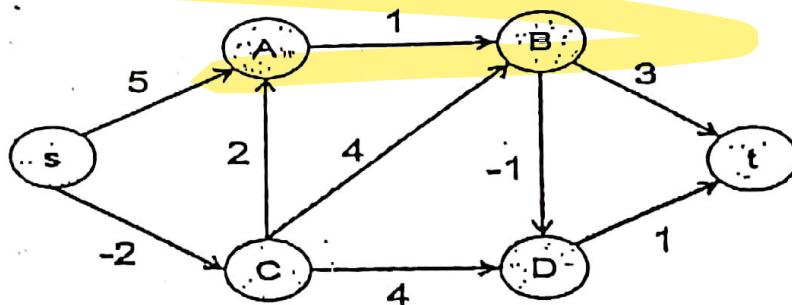
2. LIFO Branch and Bound

3. Least cost search

Q5 (a) Write down Dijkstra algorithm. Show step by step implementation of the same algorithm on the given graph with A as the source node .

[5 Marks]

(b) Write down Bellman ford algorithm. Show step by stem implementation of the same algorithm on the given graph

[5 marks]

Q6. Write short notes on

(i)   Big-oh
(ii) Big-omega
(iii) Big-theta
(iv) RAM Model

[2+2+2+4=14]

Q7.(a) Explain the characteristics of a problem that can be solved efficiently using Dynamic programming technique.

[5 Marks]

(b) Write an algorithm for quick sort. Explain with an example and show the analysis for the algorithm.

[5 Marks]