ME Sem I / Comp / Choice base / Second half 2018

(3 Hours)   [Total Marks : 80]

N.B.   (1) Question No. 1 is compulsory
   (2) Attempt any three out of remaining five questions

1.   (a) Use the master method to show that the solution to the binary-search recurrence   5
$T(n)=T(n/2)+\theta(1)$ is $T(n)=\theta(\lg n)$
    (b) Explain Knuth Morris Pratt algorithm   5
    (c) Explain Chinese reminder theorem   5
    (d) Explain difference constraint problem   5

2.   (a) Solve following matrix chain multiplication   10
        P = <35, 10, 5, 30, 20, 15>

    (b) What is convex hull? Explain Graham's scan in detail.   10

3.   (a) Rewrite Floyd Warshall Algorithm and Explain with example   10

    (b) Working modulo q = 11, how many spurious hits does the Rabin-Karp matcher
encounter in the text T = 3141592653589793 when looking for the pattern P = 26?   10

4.   (a) Find LCS of following strings   10

        X= "ABCBDAB"

        Y= "BDCABA"

    (b) Prove that TSP is NP complete algorithm   10

5.   (a) Apply Ford Fulkerson on following flow network. And find Maximum flow   10
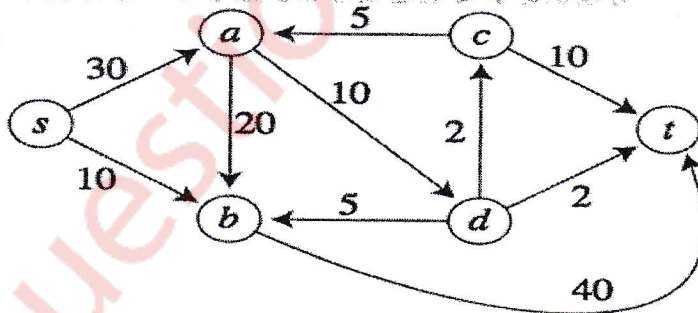
    (b) Consider an RSA key set with p =11, q =29, n =319, and e =3. What value of d should be
used in the secret key? What is the encryption of the message M =100?   10

6.   Write short note on following (any 4)   20

    (a) Vertex Cover as NP Complete

    (b) Line segment properties

    (c) Amortized analysis

    (d) Game theoretic techniques

    (e) Bellman Ford algorithm

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