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BICS-014

B.Tech. – VIEP – COMPUTER SCIENCE AND ENGINEERING (BTCSVI)

Term-End Examination

00037

June, 2014

BICS-014 : DESIGN AND ANALYSIS OF ALGORITHM

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **seven** questions. All questions carry equal marks.*

1. (a) Let f(n) and g(n) be asymptotically non-negative functions. Using the basic definition of θ-notation, prove that max [f(n) . g(n)] = θ [f(n) + g(n)]. *5*

(b) Find complexity of this equation *5*

$$T(n) = \sqrt{n}\ T(\sqrt{n}) + n$$

2. (a) Illustrate the operation of

Heap-extract max on the heap

A = {15, 13, 9, 5, 12, 8, 7, 4, 0, 6, 2, 1} *5*

(b) Describe performance of quick-sort. *5*

3. (a) Define amortized analysis and define aggregate and potential methods. *5*

(b) Compute prefix function π for the pattern ababbabbabbababbabb. The alphabet $\Sigma = \{a, b\}$. 5

4. (a) Define Hashing algorithms. 5

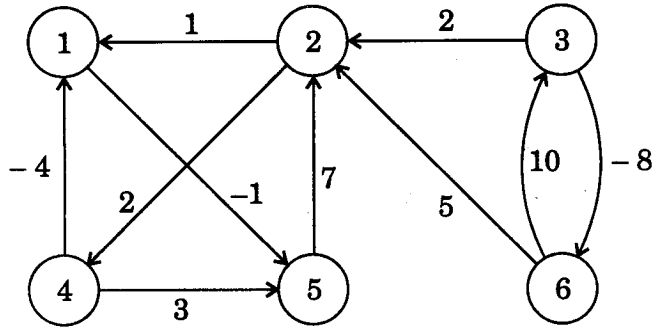
(b) Define the merge sort complexity. 5

5. (a) Prove the correctness of Kruskal's algorithm. 5

(b) Define dynamic programming procedure. 5

6. (a) Define Backtracking approach using 8×8 Queen problem. 5

(b) Solve 5



7. (a) Prove that Clique problem is NP complete. 5

(b) Define Rabin – Karp string matching technique. 5

8. (a) Define Travelling Salesman problem with the triangle inequality and also define Sum of Subset problem. 5

(b) What are greedy algorithms ? Define 0/1 Knapsack problem. 5

9. (a) Define Hamiltonian cycle problem. 5

(b) Define the Monte Carlo algorithm. 5

10. Attempt any ***two*** from the following : 2×5

(i) Define Las Vegas algorithm.

(ii) Define randomized quick-sort.

(iii) Define universal hashing.