Pokhara University

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| Level: Bachelor | Semester: Spring | Year : 2014 |
| Programme: BE | | Full Marks: 100 |
| Course: Analysis and Design of Algorithm | | Pass Marks: 45 |
| Time : 3hrs. |

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| *Candidates are required to give their answers in their own words as far as practicable.* |
| *The figures in the margin indicate full marks.* |
| Attempt all the questions. |

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|  | 1. Define algorithms? What are the criteria's that an algorithm must satisfy? 2. What do you understand by Complexity of an algorithm? Explain the asymptotic notations Big Ο, Big Ω, and Big Θ. | 7  8 |
|  | 1. For a recursive algorithm, if the value of T(1)=2 and T(n) given by T(n/2) + c for n>1, then compute the complexity of the algorithm. 2. Define sets and disjoint set. Write an algorithm for binary search tree. | 8  7 |
|  | 1. Briefly explain the Dynamic Programming method for problem solving. What is the basic difference between Dynamic Programming and Greedy method? 2. Solve and compute the following recursive relation. | 7  8 |
|  | 1. Consider five items along with their respective weights and profit values   Items I = < I1, I2, I3, I4, I5 >  Weights w=< 5, 10, 20, 30, 40 >  profit value v= <30, 20, 100, 90, 160 >  The Knapsack has capacity W=60. Find an optimal solution to the Knapsack Problem.   1. Let X=a,b,b,a,a and Y=b,b,a,a. Find the minimum cost requires to transform X into Y, if each insertion and deletion takes 1 unit and change takes 2 units of time. | 8  7 |
|  | 1. Devise an algorithm using the idea of Breadth First Search to find the shortest (directed) cycle containing a given vertex v. 2. Differentiate depth first search and breadth first search. Generate spanning tree for graph below using both approach.   E:\BE Questions\Engineering 2014\BE Spring 2014\Figures\ADS.jpg | 7  8 |
|  | 1. Briefly explain the Backtracking method for problem solving? 2. How do you solve 8-queens problem using backtracking? Explain. | 8  7 |
|  | Write short notes on: **(Any two)**   1. Tree Vertex Splitting Problem. 2. Random Algorithm. 3. Stressen's Matrix for Multi[lication. | 2×5 |