B.E./Insem/Oct-80

B.E. (Computer Engineering) (Semester - I)
DESIGN & ANALYSIS OF ALGORITHMS
(2012 Pattern)

Time :1 Hour]   *[Max. Marks :30*

Instructions to the candidates:

   1)   *Answer Q.1 or Q.2, Q3 or Q.4, Q.5 or Q.6.*

   2)   *Draw neat diagram whenever necessary.*

   3)   *Figures to the right indicate full marks.*

   4)   *Assume suitable data if necessary.*

Q1) a)   Solve the following recurrence relation using master theorem   **[6]**

     i) $T(n) = T\left(\dfrac{n}{2}\right) + \theta(1)$

     ii) $T(n) = 4T(n/2) + n^2$

   b)   Explain accounting method of Amortized Analysis with Stack example **[4]**

<p align="center">OR</p>

Q2) a)   Write an algorithm for Recursive Binary Search. What is the Time Complexity for Successful Search and Unsuccessfull Search?   **[6]**

   b)   Define asymptotic notations. Explain their significance in analyzing algorithms.   **[4]**

Q3) a)   Write an algorithm to solve knapsack problem using greedy strategy. State its time complexity.   **[6]**

   b)   Explain use of dynamic programming to compute a binomial coefficient. State its time complexity.   **[4]**

<p align="center">OR</p>

Q4) a)   Using job scheduling deadlines find the optimal schedule for following jobs with n = 6. Profits:(P1,P2,P3,P4,P5,P6) = (20,15,10,7,5,3) and deadline: (dl,d2,d3,d4,d5,d6) = (3,1,1,3,1,3)   **[6]**

   b)   Write control abstraction for greedy strategy.   **[4]**

<p align="right">***P.T.O.***</p>

Q5) a) Give the Definition of Implicit Constraint and Explicit Constraint. State and Explain both the constraint using 8 Queen Example **[6]**

b) State the control abstraction for FIFO based Branch and Bound method. **[4]**

OR

Q6) a) Write an algorithm to solve N-Queens problem. **[8]**

b) Define the following terms with respect to branch and bound strategy (any 2):

i) State space tree, ii) Live node, iii) E-node, iv) Answer node **[2]**

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