Code No: NR220502 **NR** **Set No. 2**

II B.Tech II Semester Examinations,December 2010
DESIGN AND ANALYSIS OF ALGORITHMS
Computer Science And Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Given three sets $\{1, 3, 5, 7\}$, $\{2, 4, 8\}$ *and* $\{6\}$ in which n=8 with external names 1,2 and 3 respectively with the corresponding internal names 2,3 and 1. Write the data structure for UNION-FIND algorithm using a linked list. Then write the data structure after UNION instruction [16]

2. What is interpolation? Explain Lagrange interpolation algorithm & Newtonian Interpolation algorithm. [16]

3. Explain the Kruskal's algorithm with an example and analyze its time complexity. [16]

4. (a) Devise a version of Merge sort algorithm which perform sorting in-place.
   (b) Explain the control abstraction of divide and conquer strategy. [10+6]

5. (a) Write the implementation of DELETE (b,s) in which an element b found at vertex v of a binary Search tree whose elements belong to set S.
   (b) Given the following binary search tree. (figure 3b)

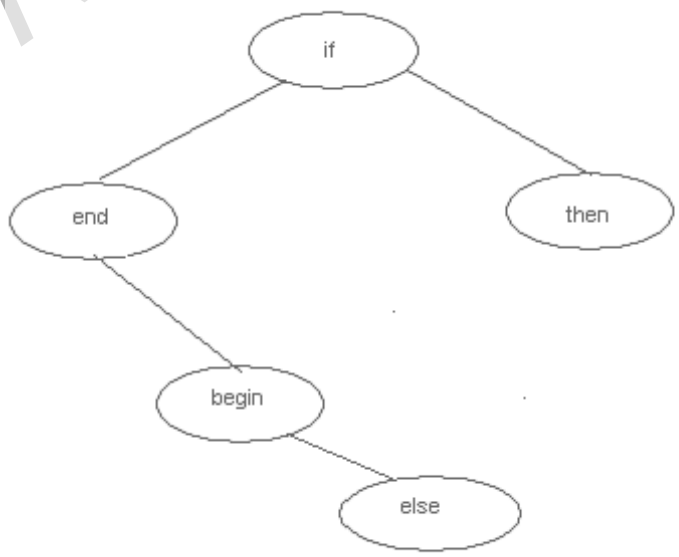

Figure 3b
Write the binary search tree after DELETE of if node. Explain its working. [10+6]

6. (a) Draw the portion of the state space tree generated by LCKNAP for the knapsack instances:
$n = 5, (P_1, P_2,..,P_5) = (10, 15, 6, 8, 4), (w_1w_2, ...w_5) = (4, 6, 3, 4, 2)\, and\, M = 12.$
   (b) What do you mean by bounding? Explain how these bound are useful in branch and bound methods. [8+8]

7. (a) Explain the differences between Greedy and Dynamic programming method of problem solving techniques.
   (b) Prove that algorithm for construction of an optimal binary search tree requires $O(n^3)$ time. [6+10]

8. (a) Write a detailed note on graph coloring. Present an algorithm which finds all m-colorings of a graph.
   (b) Draw the state space for the m-closing graph using an suitable graph [8+8]

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Code No: NR220502 **NR** **Set No. 4**

II B.Tech II Semester Examinations,December 2010
DESIGN AND ANALYSIS OF ALGORITHMS
Computer Science And Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Explain the differences between Greedy and Dynamic programming method of problem solving techniques.
   (b) Prove that algorithm for construction of an optimal binary search tree requires $O(n^3)$ time. [6+10]
2. (a) Write a detailed note on graph coloring. Present an algorithm which finds all m-colorings of a graph.
   (b) Draw the state space for the m-closing graph using an suitable graph [8+8]
3. Explain the Kruskal's algorithm with an example and analyze its time complexity. [16]
4. What is interpolation? Explain Lagrange interpolation algorithm & Newtonian Interpolation algorithm. [16]
5. (a) Write the implementation of DELETE (b,s) in which an element b found at vertex v of a binary Search tree whose elements belong to set S.
   (b) Given the following binary search tree. (figure 3b)

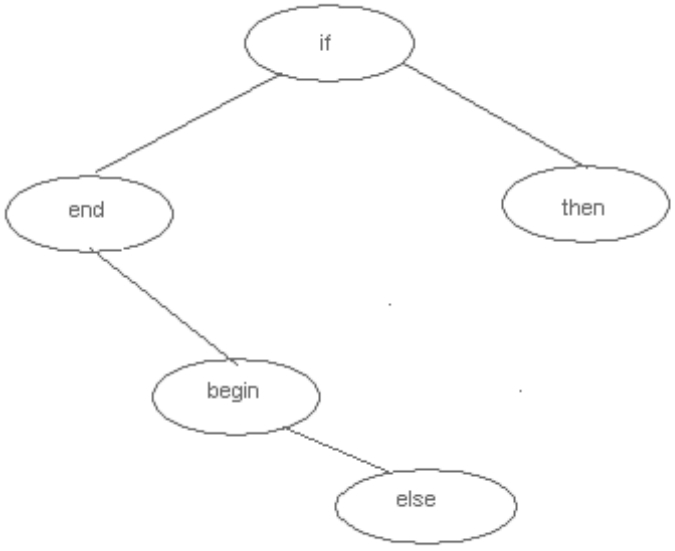

Figure 3b

Write the binary search tree after DELETE of if node. Explain its working. [10+6]

6. (a) Devise a version of Merge sort algorithm which perform sorting in-place.
   (b) Explain the control abstraction of divide and conquer strategy. [10+6]

7. (a) Draw the portion of the state space tree generated by LCKNAP for the knapsack instances:
   $n = 5, (P_1, P_2,..,P_5) = (10, 15, 6, 8, 4), (w_1w_2, ...w_5) = (4, 6, 3, 4, 2)\, and\, M = 12.$
   (b) What do you mean by bounding? Explain how these bound are useful in branch and bound methods. [8+8]

8. Given three sets $\{1, 3, 5, 7\}, \{2, 4, 8\}\, and\, \{6\}$ in which n=8 with external names 1,2 and 3 respectively with the corresponding internal names 2,3 and 1. Write the data structure for UNION-FIND algorithm using a linked list. Then write the data structure after UNION instruction [16]

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Code No: NR220502 **NR** **Set No. 1**

II B.Tech II Semester Examinations,December 2010
DESIGN AND ANALYSIS OF ALGORITHMS
Computer Science And Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Explain the Kruskal's algorithm with an example and analyze its time complexity. [16]

2. Given three sets $\{1, 3, 5, 7\}, \{2, 4, 8\}$ *and* $\{6\}$ in which n=8 with external names 1,2 and 3 respectively with the corresponding internal names 2,3 and 1. Write the data structure for UNION-FIND algorithm using a linked list. Then write the data structure after UNION instruction [16]

3. (a) Devise a version of Merge sort algorithm which perform sorting in-place.
   (b) Explain the control abstraction of divide and conquer strategy. [10+6]

4. (a) Write a detailed note on graph coloring. Present an algorithm which finds all m-colorings of a graph.
   (b) Draw the state space for the m-closing graph using an suitable graph [8+8]

5. What is interpolation? Explain Lagrange interpolation algorithm & Newtonian Interpolation algorithm. [16]

6. (a) Write the implementation of DELETE (b,s) in which an element b found at vertex v of a binary Search tree whose elements belong to set S.
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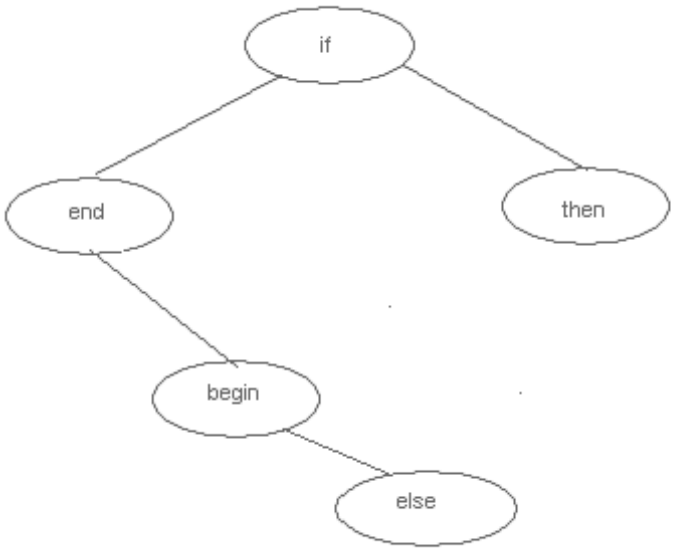

Figure 3b

Write the binary search tree after DELETE of if node. Explain its working. [10+6]

7. (a) Draw the portion of the state space tree generated by LCKNAP for the knapsack instances:
$n = 5, (P_1, P_2,..,P_5) = (10, 15, 6, 8, 4), (w_1 w_2, ...w_5) = (4, 6, 3, 4, 2)\, and\, M = 12.$

   (b) What do you mean by bounding? Explain how these bound are useful in branch and bound methods. [8+8]

8. (a) Explain the differences between Greedy and Dynamic programming method of problem solving techniques.

   (b) Prove that algorithm for construction of an optimal binary search tree requires $O(n^3)$ time. [6+10]

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Code No: NR220502 **NR** **Set No. 3**

II B.Tech II Semester Examinations,December 2010
DESIGN AND ANALYSIS OF ALGORITHMS
Computer Science And Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Given three sets $\{1, 3, 5, 7\}$, $\{2, 4, 8\}$ *and* $\{6\}$ in which n=8 with external names 1,2 and 3 respectively with the corresponding internal names 2,3 and 1. Write the data structure for UNION-FIND algorithm using a linked list. Then write the data structure after UNION instruction [16]

2. (a) Explain the differences between Greedy and Dynamic programming method of problem solving techniques.
   (b) Prove that algorithm for construction of an optimal binary search tree requires $O(n^3)$ time. [6+10]

3. (a) Write the implementation of DELETE (b,s) in which an element b found at vertex v of a binary Search tree whose elements belong to set S.
   (b) Given the following binary search tree. (figure 3b)

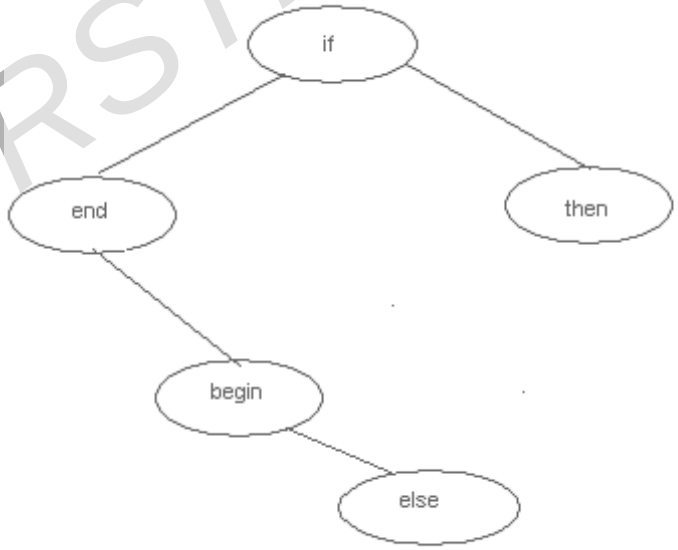

Figure 3b
Write the binary search tree after DELETE of if node. Explain its working. [10+6]

4. (a) Devise a version of Merge sort algorithm which perform sorting in-place.
   (b) Explain the control abstraction of divide and conquer strategy. [10+6]

5. Explain the Kruskal's algorithm with an example and analyze its time complexity. [16]

6. (a) Write a detailed note on graph coloring. Present an algorithm which finds all m-colorings of a graph.
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7. What is interpolation? Explain Lagrange interpolation algorithm & Newtonian Interpolation algorithm. [16]

8. (a) Draw the portion of the state space tree generated by LCKNAP for the knapsack instances:
   $n = 5, (P_1, P_2,..,P_5) = (10, 15, 6, 8, 4), (w_1w_2, ...w_5) = (4, 6, 3, 4, 2)\, and\, M = 12.$
   (b) What do you mean by bounding? Explain how these bound are useful in branch and bound methods. [8+8]

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