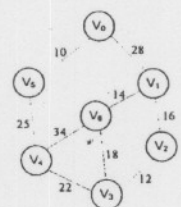


資料結構 試題 (限用答案本作答)

1. Write a recursive program that evaluates the value of the following expression. (8%)
 $((n-1)/n) * ((n-2)/(n-1)) * \dots * (1/2)$ where $n \geq 2$
2. Instead, use an iterative way to write a program that evaluates the value of the above expression. (7%)
3. Consider a Queue containing N data elements. Also, assume that the Queue needs to spend R seconds to remove out each element. What is the average waiting time for an element to be removed from the Queue? (10%)
4. Given the postfix form: $1\ 2\ +\ 3\ 4\ *\ 5\ /\ 6\ *\ 7\ /\ -\ 8\ 9\ /\ -$ (let / denote an integer division)
 When evaluating the value of this form with a Stack, how many executions of PUSH and POP operations on the Stack are required? (5%) What is the value resulting from the evaluation? (5%)
5. Briefly describe how to implement a Stack with two Queues. (10%)
6. What are the advantages and disadvantages of Array, Single Linked List, and Double Linked List? (5%) Briefly describe how you would decide on which one to use. (5%)
7. Assume a Binary Tree contains N terminal nodes. What can you determine about the depth of the Binary Tree? (5%)
8. Write an Abstract Data Type (ADT) that defines a Binary Search Tree. (10%)
9. What are the advantages and disadvantages of Binary Search Tree, Heap, and AVL Tree? (5%) Briefly describe how you would decide on which one to use. (5%)
10. For the following Weighted Undirected Graph, write the Adjacency Matrix of the Graph (5%); also, draw out the Minimum Cost Spanning Tree of the Graph. (5%)



11. What are the advantages and disadvantages of Bubble Sort, Quick Sort, and Heap Sort? (5%) Briefly describe how you would decide on which one to use. (5%)

試題完