

C0-R4.B3 : DATA STRUCTURE THROUGH JAVA

NOTE :

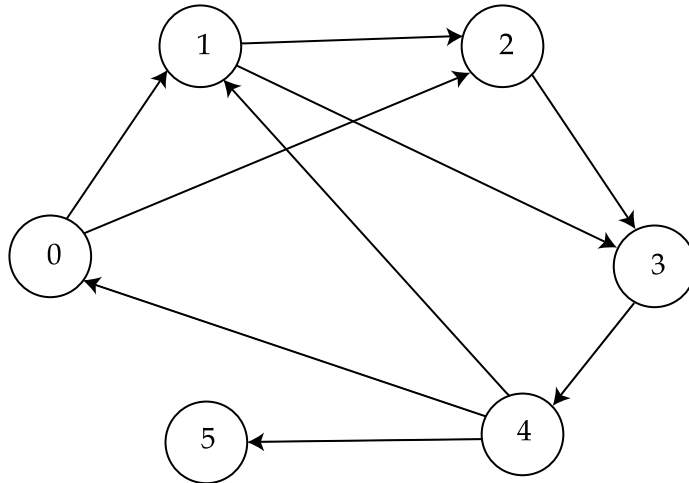
1. Answer question 1 and any FOUR from questions 2 to 7.
2. Parts of the same question should be answered together and in the same sequence.

Time : 3 Hours

Total Marks : 100

1.
 - (a) What is TRIE data structure ? Explain in brief.
 - (b) Explain Polymorphism in JAVA with example.
 - (c) What is Recursion ? Explain Tower of Hanoi Problem using Recursion for N=3 disk.
 - (d) Describe various memory allocation strategies.
 - (e) Define time complexity of algorithms. Give example of an algorithm whose time complexity is quadratic in big O notation.
 - (f) Discuss the role of Data Structure in programming.
 - (g) Write a Java code for Insertion sort. (7x4)
2.
 - (a) Why circular queue is more advantageous than simple queue ?
 - (b) Explain Big-O, Omega and theta notation with examples.
 - (c) Write short note on Abstract Data Type (ADT) and Game Trees. (6+6+6)
3.
 - (a) What is Asymptotic Algorithm Analysis ? Explain with the help of an example.
 - (b) What is quick sort ? Sort the following array using quick sort method.
75, 26, 15, 67, 85, 54, 31, 49
 - (c) Write short notes on Xtreme Programming. (6+8+4)
4.
 - (a) Write an algorithm to convert an infix expression into postfix expression.
 - (b) What is minimum spanning tree ? Write Prim's algorithm to find minimum spanning tree. Trace the algorithm with an example.
 - (c) Explain Push and POP operation on stack data structure with example. (6+9+3)
5.
 - (a) Construct a binary tree whose nodes with the given in-order and pre-order nodes as follows :
In-order : {4, 2, 1, 7, 5, 8, 3, 6}
Pre-order : {1, 2, 4, 3, 5, 7, 8, 6}
 - (b) Compare and contrast following sorting techniques with respect to memory space and computing time :
Insertion Sort, Heap Sort, Merge Sort, Quick Sort (9+9)

6. (a) Discuss AVL tree. What is the problem there in binary search tree ? What is the benefit to apply rotation in AVL tree ?
(b) Write short notes on Brute-force String pattern matching method.
(c) Apply DFS and BFS on given graph. Start vertex is 0.



(6+6+6)

7. (a) Write an algorithm that will split a circularly linked list into two circularly linked lists.
(b) What is an unhandled exception ? With an example program explain how it is handled ? What is the difference between exception and error in java ? (9+9)

- o o o -