

III/SEM/CSE/IT/2015(W)

(2)

DATA STRUCTURE

Sub Code-CST-301

Full Marks : 70

Time : 3 hours

Answer any five questions

The figures in the right-hand margin indicate marks

- 1. (a) Define ADT. 2
- (b) Why algorithm is used ? Explain the complexity of an algorithm and the space-time trade off of algorithm. 5
- (c) Give example of two linear and two non-linear data structure. Identify the application of stack and explain. 2 + 5
- 2. (a) Define substring. Give one example. 2
- (b) Define queue. How insertion and deletion takes place in a circular queue ? Draw diagram to represent the operations with the two pointers. 5
- (c) Explain how strings are stored in memory. Write the types of structures. Identify the string operations and explain with suitable example. 7

(Turn Over)

- 3. (a) What do you mean by traversal operation ? 2
- (b) Define Linear array. List out the operations perform on any linear array. Write an algorithm to insert an element in a linear array. 5
- (c) Define stack. Write PUSH and POP algorithm. 7
- 4. (a) Write two advantages of using linked list. 2
- (b) What do you mean by Garbage Collection ? Why it is used ? Give one example how a node is moved to and fro at the time of insertion and deletion operation. 5
- (c) How insertion operation is performed in a linked list ? Write an algorithm to insert a node after a prespecified node in a linked linear list. 7
- 5. (a) Define Binary tree. 2
- (b) What do you mean by tree traversal ? Draw diagram to explain different traversal. 5
- (c) What do you mean by Binary Search tree ? How it is different from simple binary tree ?

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(Continued)

(3)

- Explain how insertion and deletion takes place in a Binary Search tree with suitable diagram. 7
6. (a) What do you mean by merging? 2
- (b) Define searching. Write an algorithm for Linear Searching. Give one example. 5
- (c) List out different types of sorting techniques. Write an algorithm for Bubble Sort. Give one example. 7
7. (a) Define Graph. 2
- (b) What is a file? What do you mean by file organisation? Explain storage techniques and accessing methods in each type of organisation. 5
- (c) What is Hashing? Explain different hashing functions with examples. 7

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