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**[5057]-245**

**S.E. (E&TC/Electronics) (First Semester) EXAMINATION, 2016**

**DATA STRUCTURES AND ALGORITHM**

**(2012 PATTERN)**

**Time : Two Hours**

**Maximum Marks : 50**

**N.B. :-** (i) Neat diagrams must be drawn wherever necessary.

(ii) Figures to the right indicate full marks.

(iii) Assume suitable data, if necessary.

1. (a) Write a C function for insertion sort to sort integer numbers. [6]

(b) Explain the examples different types of data structures. [7]

*Or*

2. (a) What is a pseudo code ? Write a pseudo code to find the factorial of  $n$  number. [6]

(b) Evaluate the following postfix expression using stack : [7]

$623 + -382 / + * 2 \wedge$

*Note* :  $\wedge$  stands for power and all operands are single digit.

P.T.O.

3. (a) What is SLL ? Write C function for create a node into a singly link list. [6]
- (b) Write a short note on circular queue. Compare it with linear queue. [6]

*Or*

4. (a) What is doubly link list ? Explain insert operation in doubly link list. [6]
- (b) Explain selection sort algorithm. [6]
5. (a) Define BST. Create BST for the following numbers : [6]
- 56, 34, 89, 11, 45, 67, 6, 78
- (b) Define the following terms with examples : [6]
- (i) Strictly binary tree
- (ii) Left skewed binary tree
- (iii) Completely binary tree.

*Or*

6. (a) Explain threaded binary tree with an example. What is its advantage ? [6]
- (b) Explain expression tree with *one* example. [6]

7. (a) Write a C function to implement “BFS” traverse of graph implemented using adjacency matrix. [6]
- (b) What is indegree and outdegree of vertex in graph ? Write C function to find indegree and outdegree of vertex in graph implemented using adjacency matrix. [7]

*Or*

8. (a) Define the term graph. With the help of suitable example give adjacency matrix representation and adjacency list representation of a graph. [7]
- (b) What is difference between DFS and BFS methods. [3]
- (c) Explain term topological sorting with suitable example. [3]