Total No. of Questions—**8**] [Total No. of Printed Pages—**3**

| Seat No. | |
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# [5152]-134

**S.E. (E&TC/Electronics) (First Semester) EXAMINATION, 2017**

**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*) What do you mean by recursive function ? Explain with example. [6]

(*b*) Write a C function for linear search. Discuss its time complexity. [6]

*Or*

**2.** (*a*) Explain parameter passing by value and passing parameter by reference with suitable example. [6]

(*b*) What is pointer ? Explain advantages of pointer, pointer declaration and its initialization with an example. [6]

**3.** (*a*) What is priority queue ? What are various ways of implementing priority queue ? Explain any *one* : [6]

(*b*) Explain the following : [6]

(*i*) Garbage collection

(*ii*) Garbage compaction.

P.T.O.

*Or*

**4.** (*a*) Convert the following expression into postfix format with all steps and stack contents during every step : [6]

(a + (b * c/d) –e)

(*b*) Write short notes on : [6]

(*i*) Singly linked list and

(*ii*) Doubly linked list.

**5.** (*a*) What is BST ? Write C function for : [7]

(*i*) Finding smallest no. in BST

(*ii*) Recursive inorder traversal of BST

(*b*) What is AVL Tree ? Define balance factor. Explain RR rotation. [6]

*Or*

**6.** (*a*) What is BST ? Conduct a BST for the following numbers : [8]

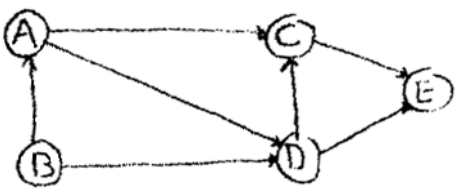
27, 42, 43, 17, 39, 31, 10, 9, 19, 54, 33, 48

Show all the steps. Write its preorder traversal.

(*b*) Explain treaded binary tree with an example. What is its advantage ? [5]

**7.** (*a*) Write a C function to implement DFS traversal of graph implemented using adjacency matrix. [7]

(*b*) Write topological sort for the following graph : [6]



**8.** (*a*) Define term graph with suitable example. Give adjacency matrix representation and adjacency list representation of the graph. [7]

(*b*) Define spanning tree. Find all the spanning tree for graph given below : [6]