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[5252]-534

S.E (E&TC/Electronics) (I Semester) EXAMINATION, 2017
DATA STRUCTURES AND ALGORITHMS
(2015 PATTERN)

Time : Two Hours

Maximum Marks : 50

- N.B. :—** (i) Neat diagram must be drawn wherever necessary.
(ii) Figures to the right indicate full marks.
(iii) Use of non-programmable electronic pocket calculator is allowed.
(iv) Assume suitable data, if necessary.

1. (a) What do you mean by recursive function ? Explain with suitable example. [6]
(b) Write a C function for insertion sort to sort integer numbers.[6]

Or

2. (a) Explain with suitable examples, how do you pass structure variable to a function. [6]
(b) What is pointer ? What are the advantages using pointer ? Explain pointer declaration and its initialization with an example.[6]
3. (a) Differentiate between SLL and DLL. [4]
(b) Write PUSH function to implement stack using array. [4]
(c) Name types of queues. Explain any *one* in detail. [4]

Or

4. (a) Write short notes on : [6]
(i) Circular Linked List.
(ii) Doubly Link List.

- (b) Explain state diagram and state table with suitable example. [6]
4. (a) Explain the following characteristics of digital IC's : [6]
(i) Fan in
(ii) Fan out
(iii) Propagation delay.
(b) Write short note on state reduction with suitable example. [6]
5. (a) Explain in detail the architecture of PLA. [6]
(b) Implement the following functions using PLA : [4]
 $F1 = \Sigma m(1, 3, 5, 7)$
 $F2 = \Sigma m(0, 2, 4, 6)$
(c) List out advantages of semiconductor memories. [3]
6. (a) Draw circuit of one-cell of static and explain its working. [6]
(b) Differentiate between ROM and RAM. [4]
(c) State advantages of PLD over fixed function IC. [3]
7. (a) Draw and explain interrupt register in detail of 8051. [6]
(b) Differentiate microprocessor and microcontroller. [4]
(c) List advantages of microcontroller. [3]
8. (a) Draw and explain block diagram of microcontroller. [6]
(b) Explain the use of program counter. [4]
(c) Explain ACALL instruction. [3]

- (b) What is queue ? Explain its implementation using any *one* method. [6]
5. (a) Using the following data, draw a Binary Search Tree. Show all steps. [4]
10 60 40 28 14 50 5
- (b) Write a C function to search element in Binary Search Tree.[4]
- (c) Define the following terms :
- (i) Root
 - (ii) Subtree
 - (iii) Level of Node
 - (iv) Dept of Tree
 - (v) Siblings
 - (vi) Height of tree
- Or
6. (a) Define Binary Tree. What are its types ? Explain with suitable figures. [4]
- (b) Write inorder, preorder and postorder traversals for the following tree. [6]

