MCA-06

M.C.A. Examination, June - 2015

Data Structure through C Language

Paper : MCA-06

Time : Three Hours]   *[Max. Marks : 80*

Note: The question paper is devided into three sections A, B and C. Write answer as per the given instruction.

Section-A

(Very Short Answer Question)

[Marks: 8x2=16]

Note: Answer all questions. As per the nature of the question delimit answer in one word, one sentence or maximum up to 30 words. Each Question carries 2 marks.

(i)   What is data structure?

(ii)   If there are N external nodes is a binary tree then what will be the no. of the internal nodes in this binary tree?

(iii)   How many leaf nodes a full binary tree with 2n+1 nodes contain?

(iv)   Define algorithm.

(v)   What is priority queue?

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(vi) What is the condition of stack overflow?

(vii) What is devide-and-conquer approach in searching?

(viii) What is the result of evaluating the given postfix expression 5, 4, 6, +, *, 4, 9, 3, /, +, *.

Section-B
(Short Answer Questions)

[Marks: 4x8=32]

Note: Answer any four questions. Each answer should not exceed 200 words. Each question carries 8 marks.

Q.2 What are the two ways of implementing stack? Which one is preferred over the other and why?

Q.3 Define the followings: (i) Graph (ii) Degree of Vertex (iii) Weight graph (iv) path

Q.4 Write an algorithm to sort elements by bubble sort algorithm. What are the time and space complexities?

Q.5 What is Doubly Linked List? Explain an example of a queue implemented using doubly linked list.

Q.6 What is searching? Give advantages and disadvantages of sequential seach technique.

Q.7 Define Graph. What are the different ways to represent a graph in computer memory? Explain.

Q.8 Describe recursive method of Tower of Hanoi.

Q.9 Discuss the complexity analysis of Insertion Sort with example.

Section-C
(Long Answer Question)

[Marks: 2x16=32]

Note: Answer any two questions. You have to delimit you each answer maximum upto 500 words. Each question carries 16 marks.

Q.10 What is the importance of Circular Linked List? Explain the process of inserting a new node at 3rd position in circular link list.

Q.11 Explain Breadth First Seach (BFS) and depth first seach (DFS) with suitable example.

Q.12 What do you understand by Asymptotic Notations? What is the difference between time complexity and space complexity? Explain omega notation, compare it with the other popular notations.

Q.13 Explain the worst case complexity in Quick Sort. Show all the passes using Quick sort technique with the following list: 1, 2, 3, 4, 5, 6.

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