RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous Degree College with P.G. Section under University of Calcutta)

B.A./B.SC. SECOND SEMESTER EXAMINATION, MAY 2011

FIRST YEAR

Date : 26/05/2011 **COMPUTER SCIENCE (General)**

Time : 10 am – 12 noon Paper : II Full Marks : 50

Answer <u>any five</u> questions:

1. a) Compare and contrast Insertion Sort with Bubble Sort.
   b) Illustrate Selection Sort algorithm with an example. (In descending order) [4+6 = 10]

2. a) i) Illustrate Breadth First Search Traversal algorithm for a non-trivial graph.
      ii) Compare Depth first search with Breadth First Search.
   b) i) What are the advantages of circular Queue over linear queue.
      ii) What are modifications needed on linear queue to make it a circular queue? [(4+2)+(2+2) = 10]

3. a) i) What do you mean by Time complexity of an algorithm.
      ii) Illustrate the time complexity in terms of Big Oh, Big Omega, Big Theta notations with proper example and diagram. (Asymptotic diagram)
   b) "Binary Search can only perform on Sorted list"— Justify with an example. [(2+4)+4 = 10]

4. a) Convert the following infix expression into its equivalent prefix and postfix form :
      A * (B+D)/E – F*(G + H)/K)
   b) i) State Divide and Conquer technique for a problem of size N.
      ii) Name two algorithms that follow this technique
   c) What is stack? How does it differ from queue? [4+(2+2)+(1+1) = 10]

5. a) What do you mean by Dead lock? State its necessary conditions.
   b) Compare and contrast between Multiprogramming and Multitasking. How will you define "Degree of Multiprogramming". [(2+4)+(3+1) = 10]

6. a) i) What do you mean by Mutual Exclusion?
      ii) Define critical Region
      iii) State the role of Lock variable to handle mutual exclusion.
   b) i) Describe Producer consumer problem.
      ii) What is semaphore? [(2+2+2)+(2+2) = 10]

7. a) i) Illustrate preemptive priority Scheduling algorithm with a suitable example.
      ii) Discuss it's disadvantages.
   b) i) What is Internal Fragmentation and External Fragmentation?
      ii) Illustrate it with suitable example and diagram. [(3+2)+(2+3) = 10]