

# RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College under University of Calcutta)

B.A./B.SC. SECOND SEMESTER EXAMINATION, MAY 2012

FIRST YEAR

COMPUTER SCIENCE (General)

Date : 28/05/2012

Time : 11 am – 1 pm

Paper : II

Full Marks : 50

Answer **any five** questions :

1. Write an algorithm to illustrate bubble sort. Can you modify it to improve its complexity? Explain. [10]
2. What is process? What are its different states? Explain state transition diagram of a process. [2+3+5]
3. Compare Stack with Queue. Mention their applications. What are different types of operations that can be performed on them. [10]
4. a) Define and give the geometrical representation of Big-O, Big-Ω and Big-θ with proper example. [6]  
b) What do you mean by Divide and Conquer technique? Give the generalized algorithm for it. [4]
5. a) What do you mean by critical region? Describe the produce – consumer problem in Inter process communication. How can you solve it using semaphore? [2+3+2]  
b) Differentiate between multiprogramming and time sharing system. [3]
6. a) “Binary search can only be performed on a sorted list” —Justify. What are the modification required in the binary search algorithm if we want to perform the search operation on a list that is sorted as descending order. [2+3]  
b) Convert following infix expression to its equivalent prefix and postfix version :  
$$A + B / C * E / ((D + F) * C)$$
 [3]  
c) State the “finiteness” and effectiveness” properties of an algorithm. [2]
7. Write notes on (**any two**) : [5×2]
  - a) Deadlock
  - b) Fragmentation
  - c) Circular Queue
  - d) Binary Search

