RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College under University of Calcutta)

FIRST YEAR

B.A./B.SC. SECOND SEMESTER (January – June), 2012

Mid-Semester Examination, March 2012

Date : 20/03/2012 **COMPUTER SCIENCE (General)**

Time : 11 am – 12 noon Paper : II Full Marks : 25

Answer <u>Question No. 1</u> and <u>any two</u> from the rest :

1. What do you mean by Convoy Effect? In which kind of Scheduling technique does it occur? Illustrate the concept of multiprogramming with a suitable example. [2+½+2½]

OR

What do you mean by Algorithm? Illustrate its properties with respect to a suitable example. [2+3]

2. a) What do you mean by dead lock? State the necessary conditions for it. [2+3]

   b) What do you mean by aging? Consider the following processes available with their arrival time and burst time :

Processes	Arrival Time	Burst Time
P_1	0 ms	10 ms
P_2	2 ms	8 ms
P_3	6 ms	4 ms
P_4	4 ms	5 ms

   Find the average waiting time using preemptive SJF scheduling algorithm. [2+3]

3. a) What do you mean by Time complexity of an algorithm? Define Big $\bigcirc$, Big Ω and Big θ with proper example and give their geometrical interpretation. [2+5]

   b) Give the increasing order of the asymptotic complexity of the following functions :

   $f_1(n) = 2^n$; $f_2(n) = n^{\log_2 n}$; $f_3(n) = n^{3/2}$; $f_4(n) = n \log_2 n$. [2]

   c) Show that $f(n) \in O(n^2)$, where $f(n) = 2n^2+5n+3$. [1]

4. a) If $f(n) \in O(g(m))$ and $g(m) \in O(h(m))$, then show that $f(n) \in O(h(m))$. [3]

   b) What do you mean by process? Illustrate the life-cycle of a process with proper diagram. Give the picture of process control block. [1+3+2]

   c) What do you mean by an exponential type algorithm? [1]