RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College under University of Calcutta)

SECOND YEAR

B.A./B.SC. THIRD SEMESTER (July – December), 2011

Mid-Semester Examination, September, 2011

Date : 12/09/2011 **COMPUTER SCIENCE (Honours)**

Time : 2 pm – 4 pm Paper : III Full Marks : 50

Answer <u>any five</u> questions : [5×10 = 50]

1. Write a regular expression for each of the following sets.
   a) The sets of all binary strings containing the substring 00 atleast once.
   b) The set of all binary strings <u>not</u> containing the substring 00.
   c) The set of all binary strings whose length is multiple of three.
   d) The set of all binary strings which represent an even non-negative decimal integer.
   e) The set of all binary strings where every 0 s immediately followed by atleast two 1's. [5×2 = 10]

2. Write the steps for converting a non-deterministic finite automation (NDFA) to equivalent deterministic finite automation (DFA). Illustrate your steps with an example chosen by you. [10]

3. a) What is assembler?
   b) What do you mean by compiler?
   c) Describe different phases of compilation. [2+2+6 = 10]

4. Define following terms with proper illustrations.
   a) Operating System
   b) Process
   c) System Call
   d) PCB

5. a) What is dead lock? Describe its necessary conditions.
   b) At which circumstances, CPU scheduling would be preemptive or non-preemptive? [(2+4)+4 = 10]

6. a) Consider the following set of processes with the length of the CPU-burst time given in millisecond?

<u>Process</u>	<u>CPU-burst time</u>	<u>Priority</u>
P1	10	3
P2	1	1
P3	2	5
P4	1	4
P5	5	2

   The processes are assumed to have arrived in the order P1, P2, P3, P4, P5 all at time zero (i.e. initially). What is the waiting time of each process for round-robin scheduling (quantum = 1) algorithm? Also find the average waiting time in case of priority scheduling.
   b) What do you mean by starvation and what is its solution?
   c) What is the main advantage of the layered approach to system design? [6+2+2 = 10]