RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College under University of Calcutta)

SECOND YEAR

B.A./B.SC. THIRD SEMESTER (July – December), 2012

Mid-Semester Examination, September 2012

Date : 11/09/2012

Time : 11 am – 12 noon

COMPUTER SCIENCE (General)

Paper : III

Full Marks : 25

Answer *Question No. 1* and *any two* from rest of the questions

1. Answer *any two* questions: $2\frac{1}{2} \times 2$

   a) "Tuples in a relation is not ordered"-Justify

   b) What is the complete set of relational algebra operations and why they are call so?

   c) What is the purpose of Program Counter and Instruction Register?

   d) Write short note on IEEE Standard for Floating Point Representation.

2. a) Illustrate the Three Schema Architecture. How Data Independence can be achieved from it? 4 + 3
   b) What do you mean by entity integrity constraint and referential integrity constraint? 3

3. a) Show the internal structure of a Central Processing Unit with a suitable diagram. 5
   b) Perform (-4) x 6 using Booth's multiplication algorithm. 5

4. a)Design an *ER Diagram* for the below schema.

   Consider the following set of requirements for a University database that is used to keep track of student's transcripts.

   i) The university keeps track of each student's name, student number, current address, phone, DOB, Sex, Class (eq : first year, second year etc.), major, department and degree. Some user applications need to refer to the city, state, and pin code of students' current address and to student's last name. Student number has unique values for each student.

   ii) Each department is described by a name, department code, office number, office phone and college. Both name and code have unique values for each department.

   iii) Each course has a course name, description, course number, number of semesters and offering department. The value of the course number is unique for each course.

   iv) Each section has an instructor, semester, year, course and section number. The value of section number is unique.

   v) A grade report has a student, section, grade (1,2,3 or 4). 5

   b) What is the advantage of using signed 2's complement representation over other schemes in computer architecture? 2

   c) Evaluate the arithmetic expression X=(A-B+C)/D using two address instruction. 3