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 : 19/03/2012 **COMPUTER SCIENCE (Honours)**

Time : 11 am – 1 pm Paper : II Full Marks : 50

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

1. a) Find value of y when x = 1·5 from following able using a suitable interpolation.

x	1	2	3	4	5	6	7	8
y	1	8	27	64	125	216	343	512

   b) Derive Lagrange's interpolation formula. [5+5]

2. a) Use trapezoidal rule to evaluate $\int_1^3 (2x+3)dx$, what is relative error in your answer?
   b) Derive Normal equations for Least Square method to fit a straight line of the form Y = aX + B.
   c) Find round-off upto 3 significant figures : 0·001010105 [3+5+2]

3. a) Solve the following system using Gauss Elimination method :
   $x + y + z = 6$
   $2x - y + 3z = 9$
   $x + 3y + 2z = 13$
   b) Solve the differential equation $\frac{dy}{dx} = x + y$ at x = 2 using Euler's method. It is given that y = 1 when x = 0. (use 4 equal intervals). [5+5]

4. a) What do you mean by bottle neck effect in Von neuman architecture?
   b) Discuss three different approaches to recover this problem. [5+5]

5. a) Describe instruction cycle briefly with proper diagram.
   b) Write notes on—
   Interrupt Service Routine, Indirection in operand fetch/store. [5+5]

6. a) Explain memory hierarchy briefly.
   b) Explain working principle of cachememory.
   c) Describe how set associative mapping can be used in cache designing. [3+4+3]

7. a) Write an algorithm to delete the last node from single linked list.
   b) Write a C program to merge two sorted array in a third array. [5+5]