CE 601 NUMERICAL METHODS

TUTORIAL – 8

Marks – 50   **Date: 09-October-2012**

The due date of responses to the tutorial questions is on 15-October-2012 (Monday). You may use if required, computational programs like Matlab, Mathematica, Fortran, C, C++, etc. or any other convenient programming language (maybe even MS-Excel) to evaluate operations like additions, multiplications, matrix operations, etc.

1. The data given below is for distance covered by a body at a specified period. Calculate 0.3 seconds, a) the velocity using second-order centered difference and one-sided forward difference formulas and b) acceleration of the body using third-order forward difference and fourth order centered difference formulas. **[30 marks]**

t	0	0.1	0.2	0.3	0.4	0.5	0.6
x	30.13	31.62	32.87	33.64	33.95	33.81	33.24

2. A river is 80 m wide. The depth of water (in m) of the river at a distance x from one bank is given by the following table:

x	0	10	20	30	40	50	60	70	80
d	0	4	7	9	12	15	14	8	3

Find the area of cross-section of the river using a) trapezoidal rule, b) Simpson's one-third rule, and c) Simpson's 3/8 rule. **[20 marks]**