King Fahd University of Petroleum and Minerals
College of Computer Sciences and Engineering

CISE 301 – Numerical Methods (T112)

Homework # 01 (*due date & time: Wednesday 15/02/2012 during class period*)

***** Show all your work. No credit will be given if work is not shown! *****

Showing all calculations steps (i.e. final answers alone are not acceptable), solve the following problems:

Problem 1 (15 points): Convert the following binary numbers to decimal:

1. $(10010110)_2$
2. $(10011100.0101)_2$
3. $(110010.1001)_2$

Problem 2 (25 points): Problem 4.4 of the textbook. Discuss the meaning of the results with respect to the convergence of the error.

Problem 3 (20 points): Problem 4.5 of the textbook.

Problem 4 (20 points): Obtain the first three non-zero terms of the Taylor series expansions of $\sin(2x)$ about the center of expansion $x = \pi$.

Problem 5 (20 points): Find the least number of terms required to compute π as 3.14 (rounded) using the following series:

$$\pi = 4 - \frac{4}{3} + \frac{4}{5} - \frac{4}{7} + \frac{4}{9} - \ldots$$