AMSC/CMSC 460 Quiz 6 , Fall 2007

Show all work. You may leave arithmetic expressions in any form that a calculator could evaluate. By putting your name on this paper, you agree to abide by the university's code of academic integrity in completing the quiz. Use no books, calculators, cellphones, communication with others, scratchpaper, etc.

Name _____

1. (10) Suppose we use an Adams PECE schme to solve a differential equation $y' = f(t, y)$ and obtain $y^P_{n+1} = 1.2450$ and $y^C_{n+1} = 1.2430$. Suppose the error formula for the predictor is $\frac{5h^3}{12}y^{(3)}(\eta)$ and for the corrector is $\frac{h^4}{24}y^{(4)}(\xi)$. What can you say about the error? (Give an unambiguous statement about what error you mean and what your estimate of it is.)

2a. (5) Give an important advantage of PECE Adams methods over Runge-Kutta methods.

2b. (5) Consider the differential equation $\mathbf{y}' = \mathbf{f}(t, \mathbf{y})$, with $\mathbf{y} : \mathcal{R}^1 \rightarrow \mathcal{R}^2$. Given t_1 and $\mathbf{y}(t_1)$, how do you test whether the differential equation is stiff at t_1?