**CFD Application to Ship Hydrodynamics**

**Mid-term Test**

Time: 1:00PM – 3:00PM Tuesday, Oct. 14, 2008

Location: 34-119 SNU

*Note: Answer in English*

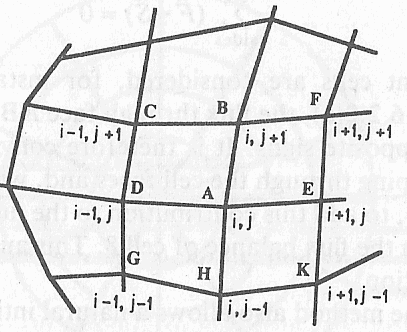
1. (20 pts) For , obtain at with using:
2. ,

and compare the accuracy of the results.

1. (10 pts) Repeat Problem 1 with and determine whether the convergence with is consistent with the leading term of the truncation error.
2. (25 pts) For , obtain at with using:
3. ,

and compare the accuracy of the results and the convergence with the leading term in the truncation error.

1. (30 pts) Develop a finite volume discretization for mesh point *A(i,j)*, with the control volume BCDGHKEF in the figure below.



Compare the results from the evaluation of the side fluxes by the following three options, written for, e.g., side *K(E)F*:

1. 
2. 
3. 
4. (15 pts) Discuss the pros and cons of the following pairs.
   1. FDM vs. FVM
   2. Structured grid vs. Unstructured grid
   3. Upwind approximation vs. Central approximation