

Name: _____

MEA 443 SYNOPTIC WEATHER ANALYSIS AND FORECASTING
Quiz 1, Thursday 8/25/2011

1.) Consider the skew-T diagram below, taken at Greensboro, NC on 23 August.

a.) Do you think that this was the 00 UTC or 12 UTC sounding? _____
Briefly justify your answer.

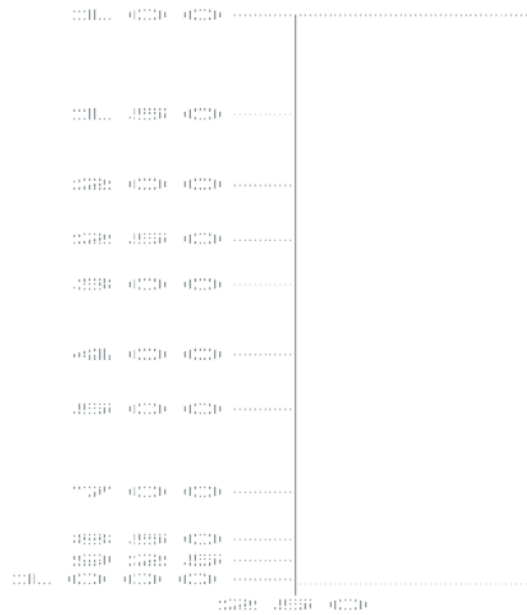
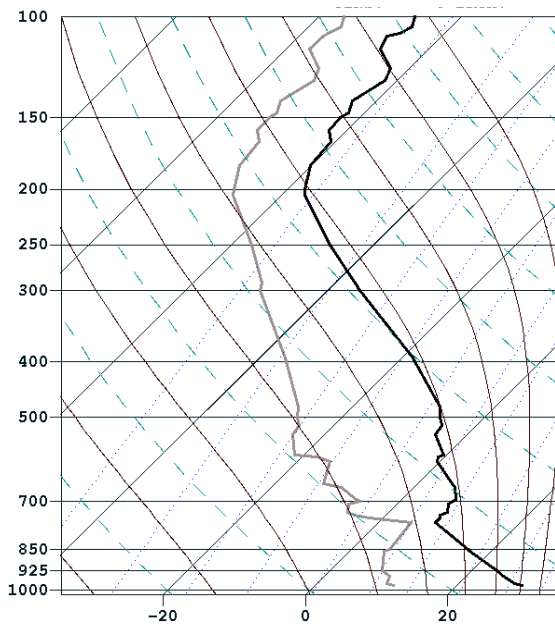
b.) What is the approximate location of the mixed-layer (PBL) top? _____ mb

c.) What is the approximate location of the tropopause? _____ mb

d.) On the blank diagram at right, draw the approximate **potential temperature** profile for this sounding as a thick solid line.

e.) Which of the following layers on this sounding is the *most stable*? _____
(i) 1000-750 mb (ii) 750-700 mb (iii) 400-250 mb

f.) Which of the following layers is the *least stable*? _____
(i) 1000-750 mb (ii) 750-700 mb (iii) 400-250 mb

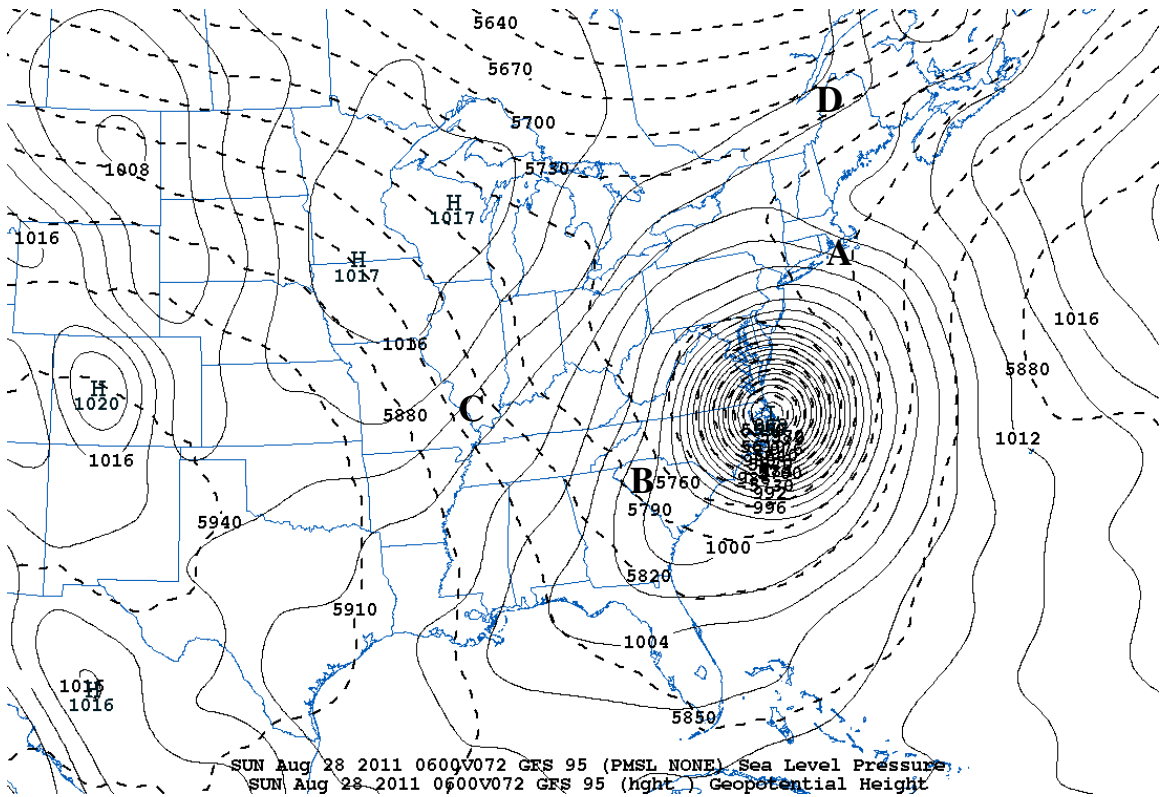


2.) The zonal potential temperature advection is given by $-u (\partial \theta / \partial x)$. For typical synoptic-scale conditions, what is an approximate order-of-magnitude value of this quantity in MKS units?

3.) Consider the GFS forecast for the eastern US and western Atlantic shown below. Dashed lines show sea level pressure, and solid lines represent the 500-mb height. For each of the points A-D, indicate the sense (warm, cold, or weak) of the geostrophic temperature advection in the surface to 500-mb layer.

A: _____ B: _____ C: _____ D: _____

At which of these locations is it most likely to be raining? _____



4.) Two east-west cross sections through Irene are shown below. One is a section of potential temperature, and one is just temperature. Label the sections with the correct parameter (label one potential temperature, the other temperature).

