Review Sheet for Exam II ATM 645 Fall 2014
Handed out on Oct 29, 2014 for 5 Nov 2014 Exam

Short Answer (closed book should take 15-30 minutes) (25%)
1. Identify the PGF and primitive equations in isobaric coordinates. Why are isobaric coordinates useful? What happens to continuity equation?
2. Identify equations and terms in the primitive equations
3. Define the natural coordinate system and identify terms in horizontal momentum equations in natural coordinates.
4. Balanced flows, their usefulness and the types and the terms used in equations in #3.
5. Draw geostrophic force balance given some information
6. Explain the geostrophic wind, conceptually not just mathematically
7. Define Trajectory and Streamline (know the difference)
8. Bouisinesq Approximation
9. Define Thermal Wind
10. Definition of Barotropic (and Baroclinic) & sketch vertical distribution of P and ρ in a barotropic (baroclinic) atmosphere.
11. How are circulation and vorticity related?
12. Identify equations for relative, absolute, and potential vorticity.
13. Given the relative vorticity equation (4.17) be able to identify the terms
14. Constrast/compare westerly and easterly flow over a topographic boundary.
15. Some basic waves concepts.

Long Answers (open book- Holton text, open notes, open homework, and photocopies from other books permitted) (45 minutes) (75%). I will most likely have 2 longer problems (one based on chapter 3 and one from chapter 4) and one higher order thinking problem (some combination of the two).

1. Review Homework 5 & 6.
2. Important Concepts
   a. Balanced Flow equations and the different approximations
   b. Thermal Wind
   c. Cold/warm air advection
   d. Circulation
   e. Vorticity
   f. Potential Vorticity
   g. Vorticity Equation & its scaling for Synoptic Scales
   h. WOAH derivations