**Names:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Activity#5**

**Applied Numerical Weather Prediction Due: 23 February 2022**

**Primitive Equations Models; WRF**

Treasure hunt questions related to the WRF V4 documentation [http://www2.mmm.ucar.edu/wrf/users/docs/technote/v4\_technote.pdf]. You must reference the page numbers utilized in your WRF V4 documentation responses in order to receive full credit on each problem.

**[5.1]** Write down the equation numbers in Section 2.2 (Flux-Form Euler Equations) of the WRF V4 documentation corresponding to each of the primitive equations listed in your textbook {Eqs. (13.11) – (13.17)}. (e) 13.15 =>

(a) 13.11 => (c) 13.13 => (f) 13.16 =>

(b) 13.12 => (d) 13.14 => (g) 13.17 =>

**[5.2]** Determine if WRF is a hydrostatic or nonhydrostatic model {cite section and page number in the WRF documentation giving the answer in order to receive full credit on this problem}.

**[5.3]** Determine if WRF is a fully compressible or anelastic model {cite section and page number in the WRF documentation giving the answer in order to receive full credit on this problem}.

**[5.4]** Determine the type of horizontal Arakawa grid used in WRF {cite section and page number in the WRF documentation giving the answer in order to receive full credit on this problem}.

**[5.5]** Determine the vertical grid coordinate used in WRF and, if WRF uses a staggered vertical grid, which prognostic variable is found on each full and half WRF vertical grid level {cite section number and page in the WRF documentation giving the answer in order to receive full credit on this problem}.

**[5.6]** Name the time discretization scheme used in WRF for the meteorologically significant (low frequency) wave modes. How are high frequency acoustic modes handled in the WRF time discretization? {cite section and page number in the WRF documentation giving the answer in order to receive full credit on this problem}.

**[5.7]** What order accuracy advection schemes are available for spatial discretization in WRF? {cite section and page number in the WRF documentation giving the answer in order to receive full credit on this problem}.