## Major Exam – Semester II (2014-2015) General Meteorology (ASL830)

Max Marks: 40 Time: 2 hour

Answer all the questions.

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- Derive the dynamical equations in a rotating coordinate system as its application to the Newton's second law. Apply the same results to events on a spherical earth.
  - b) What is the magnitude of the total Coriolis force acting on a bullet of mass m, fired with speed c from latitude  $\phi$ , whose path lies in a plane containing the earth's axis,
    - (i) at angles \$\phi\$ from the zenith?
    - (ii) at angles 90°- φ from the zenith?

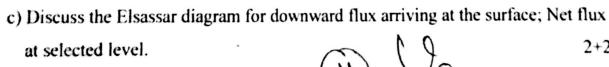


a). Discuss the Gradient Flow. Give full derivation of its equation with solution and discussion of different cases. Compare it with geostrophic values.

The equation of geostrophic flow on a surface of constant temperature may be written as  $\mathbf{fu} = -(\partial \psi/\partial y)_{\tau}$ ;  $\mathbf{fv} = (\partial \psi/\partial x)_{\tau}$ . Derive an expression for  $\psi$ .

Explain the following in detail:

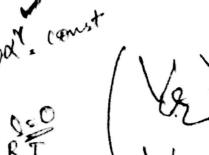
- a) Terrestrial radiation.
- b) Radiative equilibrium in the stratosphere.



4. (a) Show that the equation for an adiabatic process may be written as

 $p\alpha^{\gamma} = \text{Const. or } \alpha T^{(Cv/R)} = \text{Const.}$ 

- b) Explain the following:
  - i) Equivalent temperature
  - ii) Wet bulb potential temperature.
- iii) Dew point temperature.



V2 12

4 (212 × 6) 82

2+2+2

. 5. a) Height computation for upper air soundings with derivation.

POOL+ adP = ROT

AH= GOT -