

Q 1 (i). What is the thermodynamic diagram and its characteristics. Discuss the Tephigram in details. 4.

(ii). Suppose all the isobars on an emagram were relabeled with one half their original pressures. Show that a dry adiabat which was originally labeled with potential temperature θ_1 should be relabeled with potential temperature $\theta = 2^{1/2} \theta_1$. 4.

Q 2 (i). Discuss the hydrostatics of constant lapse rate atmosphere. 2.

(ii). Discuss the height computations for upper air soundings. 2.

(iii). What is the elevation in the geopotential feet if a pressure of 700 mb is found on a certain day to be at an elevation of 3000 geopotential meters 2.

Q 3 (i). Explain the conditional instability and discuss the slice method for stability. 6.

(ii). Calculate the numerical value of the saturated pseudo adiabatic lapse rate in $^{\circ}\text{C Km}^{-1}$ for $p=300\text{mb}$ and $T= -20^{\circ}\text{C}$ 5.

$$p = 3 \times 10^5 \text{ Pa}$$

$$T = 253 \text{ K}$$



Formula

$$dp = -\rho g$$

$$- \frac{dT}{dz}$$