Minor I

ASL 830

Time: 1 hour

Max. Marks 25

17.02.2015

Q1(i) State the Boyle's law and Charles's law. 2

Show that $\frac{\alpha_t}{T} = \frac{\alpha_0}{T_0}$

Where α the specific volume and T is is the absolute temperature.

(ii). Earth is an oblate Spheroid 2

(iii).Dalton's law 1

(iv). Poisson's Equation 2

(iv).A sample of hydrogen is at a pressure of 1000 mb and a temperature of +10^{0}C.Calculate its specific volume. 2

Q 2(i). Explain second law of thermodynamics and derive $\Phi = C_p \ln\theta$. 4

(ii). A sample of 50 g of dry air is initially at a pressure of 1000 mb and a temperature of 280^{0}K. Heat is added in an isobaric process during which the sample expands by 10% of its original volume. Calculate the final temperature of the air, the work done against the surroundings (in Joules), and the amount of heat added (in Calories) 3

Q 3(i).State and derive the Clausius Clapeyron Equation. 4

(ii). Consider a parcel of air which is saturated at temperature and pressure -3^0 C and 500mb.Calculate the values of e_s, w, q, T_e and θ_e. 5

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