

5.
 - a) In lecture we derived the Debye model for the specific heat of a lattice in the customary manner which assumes the same maximum frequency for both transverse and longitudinal waves; hence we introduced a single Debye temperature. Rederive this model permitting different maximum frequencies for transverse and longitudinal waves, and hence introduce two Debye temperatures.
 - b) Approximate your model for very, very low temperatures and show that the T^3 law is still valid.