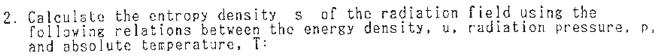
## 國立中央大學八十三學年度研究所碩士班入學試題卷

系所別: 大氣物理研究所

科目:一熟力學

共/頁第/頁

- 1. (a) State the first law of thermodynamics.
  - (b) State the Clausius statement of the second law of thermodynamics.
  - (c) State the Kelvin-Planck Statement of the second law of thermodynamics.
  - (d) Prove that both statements of second law are equivalent. (25%)



$$p = \frac{1}{3} u$$
,  $u = 6 T^4$ 

(
$$\mathcal{S}$$
 is a constant)

(20%)

- 3. From the four thermodynamic function, internal energy, enthalpy, Helmholtz function, and dibbs function derive the four Maxwell's relations. (20%)
- 4. Determine the pressure, Pc, the volume,  $\mathcal{V}_{\text{c}}$ , and the temperature, Tc, at critical point for a gas which obeys the van der Waals equations.

$$(p + \frac{a}{v^2}) (v - b) = RT$$

Where a and b are constants.

(15%)

- 5. (a)Derive Poisson's equations from first law of thermodynamics.
  - (b)From (a), discuss the relationship between pressure and temperature. (20%)

参考用