

Name :

Neptun id. number:

"Nobel-prize physics in ..."

Make Up Test 8.

1. The power emitted by the surface of a black body is directly proportional to:
(T: absolute temperature)

- a. T b. T^2 c. T^3 d. T^4 e. none of them

2. The wavelength at which the intensity *per unit wavelength* of the radiation produced by a black body is at a maximum, λ_{\max} , is a function only of the temperature :

- a. aT b. b/T c. cT² d. dT⁴ e. none of them

(where a, b, c and d are constants)

3. In thermal equilibrium the energy is shared equally among all of its various forms; for example, the average energy per degree of freedom:

- a. $3/2kT^2$ b. kT c. $1/2kT$ d. RT e. none of them

4. The de Broglie wavelength of a particle:

- a. h/p b. p/h c. h/(mv) d. \hbar/p^2 e. none of them

5. An electron initially in the $n = 3$ state of a one-electron atom of mass M at rest undergoes a transition to the $n = 1$ ground state. The recoil speed of the atom from emission of a photon is given approximately by

- a. $v = \frac{2hR}{3M}$ b. $v = \frac{hR}{8M}$ c. $v = \frac{8hR}{9M}$ d. $v = \frac{4hR}{9M}$ e. none of them

Show your work!