

## HW#7

**9-17.** A air-filled rectangular cavity with brass walls-  $\epsilon_0, \mu_0, \sigma = 1.57 \times 10^7$  (S/m) - has the following dimensions:  $a = 4$  (cm),  $b = 3$  (cm), and  $d = 5$  (cm).

- a) Determine the dominant mode and its resonant frequency for this cavity.
- b) Find the  $Q$  and the time-average stored electric and magnetic energies at the resonant frequency, assuming  $H_0$  to be 0.1 (A/m).

**9-20.** For an air-filled rectangular copper cavity resonator,

- a) Calculate its  $Q$  for the  $TE_{101}$  mode if its dimensions  $a = d = 1.8b = 3.6$  (cm) and
- b) Determine how much  $b$  should be increased in order to make  $Q$  20% higher.