Arab Academy for Science & Technology and Maritime Transport – Cairo Branch
College of Engineering & technology
Electronics & Communication Engineering Department

EC443 EM Transmitting Media

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Problems Set #8

Cavity Resonators

1. A section of 1.5 in* 3 in is air-filled wave guide which is 4 in long and is shorted at each end, forming a cavity. Find the three lowest resonance frequencies.

2. an air-filled rectangular cavity resonator has dimensions of a=5 cm, b=2 cm, d=15 cm. compute:

   a- the resonant frequency and the corresponding mode.
   b- The frequency range between the lowest resonant frequency and the following resonant frequency.
   c- Repeat a and b for d=5 cm.
   d- Repeat a and b if the dielectric constant equals 2.

3. calculate the Q-factor for a copper resonator having a=2.286 cm and b=1.016 cm and d=4.5 cm. given that it is resonating at the TE101 mode

4. A rectangular cavity having a=2 cm and b=1 cm and d=6 cm. it is filled with a dielectric having permittivity 2.5-j0.0001 at the resonant frequency of the TE101 mode. The cavity is mode of copper. Find the Q-factor for the TE101 mode.

5. An air-filled circular wave guide with a radius of 3 cm operating at the TE011 mode at 10 Ghz by placing two conducting plates at its two ends. Determine the minimum distance between them.

Good Luck☺