

EE 483/583 Antennas for Wireless Communications (Spring 2022)

Homework 1

Wednesday, January 19, 2022

- 1) 2.5b Hint: pay attention to angular ranges.
- 2) Plot polar radiation patterns for the U of 2.5b (both unitless and in dB w/ 0 to -20 dB scale) in the elevation planes coinciding with the x - z plane (i.e., wrt θ when $\phi = 0$ & 180°). Attach copy of any work done (e.g., copy of MATLAB command window, m-file, ...)
- 3) 2.7 for $U = B_0 \cos^5 \theta$ with same range of angles. Do not work problem for U given by (a) or (b).
- 4) 2.10
- 5) 2.12 for U given in (b).
- 6) Plot polar radiation patterns for U of 2.12(b) (both unitless and in dB w/ 0 to -20 dB scale) in the elevation planes coinciding with the y - z plane (i.e., wrt θ when $\phi = 90^\circ$ or 270°) and the azimuthal plane (i.e., wrt ϕ when $\theta = 90^\circ$). Attach copy of any work done (e.g., copy of MATLAB command window, m-file, ...)
- 7) 2.14 for U given in 2.12(b).
- 8) 2.28 For part (a), first find the radiation intensity and normalized radiation intensity. For part (b), first find the HPBW wrt θ .
- 9) EE 583 only- 2.8 First, find the radiation intensity and normalized radiation intensity. Typo: Second angular range is $0^\circ \leq \phi \leq 360^\circ$.

Due Monday, January 24, 2022.