ECEG 390 Theory and Applications of Electromagnetics Spring 2024

Selected Answers to HW #3

Remember to explain all answers in your solutions. You will not receive credit for merely repeating an answer given here. When an answer is not given below, it is either because the solution is trivial or because disclosure of the answer would give away too much of the solution.

Although some effort has been made to ensure that there are no errors in the answers below, some might nevertheless appear. Please let me know as soon as possible if you discover an apparent error.

1. $Z_L = 88 + j41 \ \Omega$

2. $\tilde{V}_{in} = 39e^{j0.191} = 39\angle 11° \ \text{mV rms}$; $\tilde{I}_L = 1.4e^{-j0.335} = 1.4\angle -19° \ \text{mA rms}$

3. $\tilde{V}_L = 0.79e^{-j0.786} = 0.79\angle -45° \ \text{V pk}$; $\tilde{I}_{in} = 1.2e^{j0.784} = 1.2\angle 45° \ \text{mA pk}$

4. $Z_{oQ} = 650 \ \Omega$; $d = 2.7$ m; $l_Q = 3.75$ m [make the section between the load and the quarter-wave section as short as possible]

5.   a. [answer not given]
b. VSWR = 1.4
c. VSWR = 2.1

6. $Z_{oQ} = 335 \ \Omega$; [d not given]; $l_Q = 3.75$ m