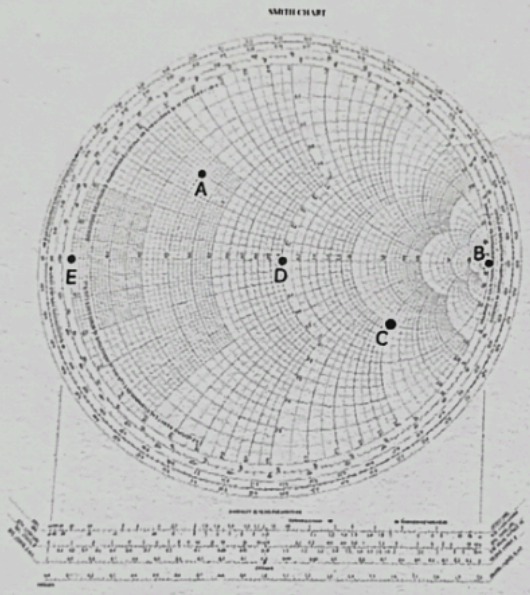
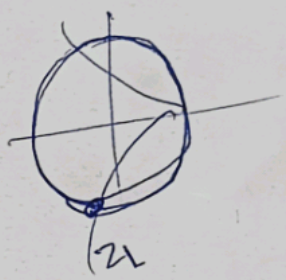
EE 301
Electromagnetic Waves
"Surprise" Quiz - 3
Time limit: 20 Mins

Instructions: Most questions are based on reasoning and concepts discussed in class. In case of reasoning questions, you need to describe your answer via simple mathematical models. **The maximum score is 20.**

1. Sketch the standing wave patterns for the following types of loads with a quick reasoning based on your knowledge of Smith charts:
   (a) Pure inductive load
   (b) Pure capacitive load
   (c) Complex inductive load
   (d) Complex capacitive load

[2 × 4 =8]





2. Using the Smith chart above, answer the questions below:
   (a) Interpreting the chart as an **Impedance Smith Chart**:
   - Identify the type of load represented by points **A** and **C**. (*Clearly specify whether the load is real, imaginary, or complex.*)
   - Among the five marked points, state which point corresponds to an **Open Circuit** and which corresponds to a **Closed Circuit**.

- Identify the point that represents a **matched load** condition ($Z_0 = Z_L$).

[5]

(b) Interpreting the chart as an **Admittance Smith Chart**:

- Repeat the same analysis for points **A** and **C**.
- Identify the points corresponding to **Open Circuit**, **Closed Circuit**, and **matched load** on the admittance chart.

[5]

3. Draw the equivalent distributed model of a lossy line. Explain the need for the extra circuit elements to be added. [2]