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| **Benha University****Faculty of Engineering at Shoubra****Electrical Engineering Department** | **she3ar** | **Microwave fundamentals****3rd Year Communications****(2013-2014)** |

**Sheet 3**

$$ Use the Smith chart to find the following quantities for the transmission line circuit below:

1. The SWR on the line.
2. The reflection coefficient at the load.
3. The load admittance.
4. The input impedance of the line.
5. The distance from the load to the first voltage minimum.
6. The distance from the load to the first voltage maximum.



$$ Repeat problem (1) for ZL= 40 - j30Ω. ***(REPORT)***

$$ Repeat problem (1) for 𝓁= 1.8λ. ***(REPORT)***

$$ Use the Smith chart to find the shortest lengths of a short-circuited 75 Ω line to give the following input impedance:

(a) Zin= 0.

(b) Zin= ∞.

(c) Zin= j75 Q.

(d) Zin= -j50 Ω

(e) Zin= j10 Ω.

$$ Repeat Problem (4) for an open-circuited length of 75 Ω line. ***(REPORT)***

$$ A slotted-line experiment is performed with the following results: distance between successive minima = 2.1 cm; distance of first voltage minimum from load = 0.9 cm; SWR of load, = 2.5. If Zo = 50 Ω, find the load impedance.

**Good Luck**

**Dr. Gehan Sami**