Q1

a)

From the equation, we have

And

Thus, the frequency is GHz and wavelength is m

b)

Direction of propagation is (- direction)

c)

Assume that

Since we have , then

Phase

Direction

Thus,

Q2

a)

Reflection coefficients:

At source:

At load:

Q3

a)

Linear polarization conditions

With , it holds that

With the polarization point to first and third quadrants (valid)

With , it holds that

With the polarization point to second and forth quadrants (invalid)

Thus

b)

One of circular polarization conditions

With , it holds that

This polarization satisfies 2 conditions that are amplitude equal and perpendicular condition.

With , it holds that

This polarization satisfies 2 conditions that are amplitude equal and perpendicular condition.

Thus, or

Q4)

a)

From the equation of , we have and

We have

And

Thus,

b)

The magnitude and phase of intrinsic impedance is

c)

Since

Magnitude

Phase

Direction

Thus,