

Competition

School on Digital Radio Communications for Research and Training in Developing Countries - Feb 2004

Group number: _____ and Motto: _____

Group Coordinator(s) : _____

Group Members : _____

Our group competes with:

- the Collinear Antenna labeled _____
for ISM channel number ___ corresponding to center frequency of _____
MHz.

- the Biquad Antenna labeled _____
for ISM channel number ___ corresponding to center frequency of _____
MHz.

1) A plane wave circularly polarized

- o is composed of two linearly polarized plane waves
- o has nothing in common with plane waves

2) A standing wave in a transmission line is the result of superposition of an incident wave and a reflected wave. With a line short-circuited at the end, the reflected voltage wave is

- o in phase with the incident wave
- o out of phase with the incident wave

3) A standing wave in a transmission line is the result of superposition of an incident wave and a reflected wave. With a line open-circuited at the end, the reflected voltage wave is

- o in phase with the incident wave
- o out of phase with the incident wave

4) A radiated electromagnetic field in free space decreases with the distance from the antenna as

- o d^2
- o d^3
- o d^4

5) A radiated electromagnetic field in a densely populated urban environment decreases with the distance as

- o d^2
- o d^3
- o d^4

6) The Spread Spectrum technique has been patented by

- o James Orinoco, the man who gave the name to the Orinoco river
- o Hedy Lamarr, a not-so-famous Hollywood actress
- o Rob Flickenger, a world-known SF writer
- o nobody, it is Open Source

7) 802.11b standard uses a

- o Frequency Division full duplex channel
- o Frequency Division half duplex channel
- o Time Division half duplex channel
- o Time Division full duplex channel

8) Which of the following will allow voice transmission over an 802.11b network

- o Push to Talk connected to the speaker
- o Software solution that takes advantage of the computer audio card
- o Using the RTP protocol
- o Using a special Voice Over IP Gateway

9) A good telecommunications ground can be accomplished by

- o Connecting to the barbed wire fence
- o Connecting to the lamp post
- o Connecting to the hot water plumbing
- o Connecting to a 2m long copper rod sunken into the ground

10) You are trying to use a can antenna to connect to a 24dBi parabolic dish at a distance of 1Km with clear line of sight. Radios on each side of the link transmit at 20dB, and the dish is mounted using horizontal polarization. The received signal strength is very weak, and there is very low noise indicated by your site survey tool. Assuming that all hardware components are functioning properly, what can you do to improve the link?

- o Trim the wire inside the can
- o Use a larger can
- o Rotate the can 90 degrees
- o Change the channel
- o Add an amplifier between the radio and the antenna

11) You have a 10Km 802.11b point-to-point link that works well at night, but degrades during the daytime. On a sunny day, your site survey tool indicates very low noise and a received signal strength of about -82dBm. The sensitivity of your radio cards are rated for 11Mbps at -82dBm. What can you do to improve the link?

- o Use a higher gain antenna on either side of the link
- o Use higher power radios
- o Add an amplifier to both sides of the link
- o Use radios with greater sensitivity
- o Any of the above

12) Why would you decide to use a captive portal (such as NoCatAuth) on your wireless network?

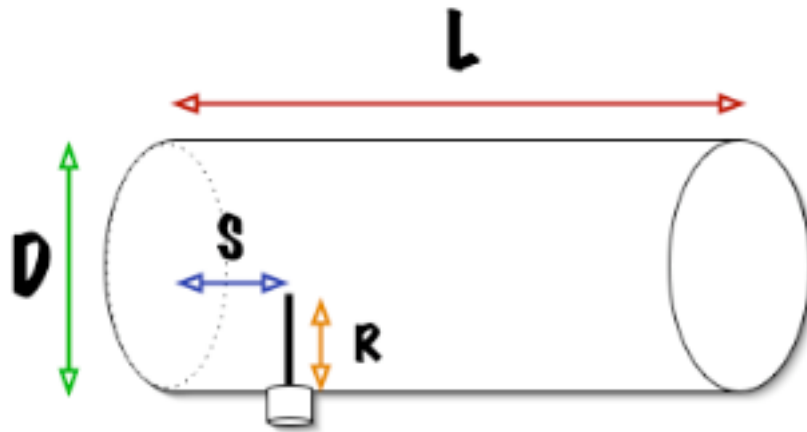
- o To identify your network to the local community
- o To restrict access to wireless network resources
- o To automatically control bandwidth usage
- o To notify your users of network policies and other important information
- o All of the above

13) What is the function of a pigtail?

- o It acts as a high-pass filter in an antenna system
- o It makes it possible to connect a radio or access point to an external antenna
- o It reduces harmonics and spurious emissions created by the radio
- o It increases the gain of an antenna
- o It serves no useful purpose

14) Given the diagram and given values, what is the value of S?

- o 6.0cm
- o 2.53cm
- o 5.07cm
- o 10.14cm
- o 3.06cm



$$\lambda_G = \frac{\lambda}{\sqrt{1 - \left(\frac{\lambda}{1.706D}\right)^2}} \quad \mathbf{S} = 0.25 \lambda_G$$

For 2447 GHz **D = 90mm** **R = 3.06cm**
 (ch 8, $\lambda=12.25$) **L = 15.3cm** **S = ???**

15) A certain transmitter outputs 25dBm. The 20m long coax cable has an attenuation of 0.22 dB/m. It is attached to a 19 dBi antenna. What is the EIRP?

- o 43.78 dBm
- o 39.6 dB
- o 39.6 dBm
- o 43.78 dBi

16) Attach the Planning and Implementation Report for the radiolink “ICTP - Muggia”.

17) Attach, if you have, additional reports of laboratory activities and measurements.

18) We declare that:

o We are returning back all lab tools, books and material that we received

o We are missing the following item(s):

Date:

Signature(s) of the Group Coordinator(s):