



Course name: Wireless Network
Course Code: CNE405
Lecturer: Dr. Ahmed ElShafee

Exam number: Midterm – Model Answer
Exam Date: 23/05/2013
Time Allowed: 60 minutes

Name: _____
ID: _____

1	2	3	4	Total
3	3	7	7	20

1. define the following terms (6)

Free path loss

.....

..... is the loss in signal strength of an electromagnetic wave that would result from a line-of-sight path through free space (usually air),

Multipath Fading

.....

..... happens when portions of signals are reflected and then arrive out of order at the receiver

Line of Sight

.....

..... That means the transmitter and receiver antennas facing each other without any opeticals including earth curvature.

2. briefly discuss the difference between WMAN (metropolitan wireless area network, and WWAN (wireless area network). state practical application (commercially available) of each technology.

WMAN:

a wireless technology support connecting different locations make them as one LAN.

It's the wireless version of MAN.

Like WiMax

WWAN:

a wireless technology used to connect the internet

the wireless version of WAN

like LTE, 3G, Edge, GSM data.

3. define the following access point mode of operation. Mention one practical application/situation to apply each mode of operation

Wireless switch (access point)

Clients connect each other using wireless LAN technology

Client of access point

A client is connected to an AP through wired Ethernet. That access point act as a client to the main access point. That client connects looks like a part of main wireless LAN and looks like it has a wireless adaptor.

Repeater

AP extends the cell of a main AP by repeating its SSID

Point to point bridge

2 APs connects each other and act as a bridge between two different locations make them as single LAN

Point to multi point bridge

More than two APs connects each other and act as a bridge between different locations make them as single LAN

4. assume that the access point transceiver power is 36 dbm, antenna gain is 5.2 dbi. Antenna is connected to transwers through 3 meters cable. Cable produces 0.1 dbi losses per meter. Calculate the power in dbm and milli watts level enters the laptop transceiver which is placed in10 meters away from the AP, considering that AP transceiver is directly connected to antenna of 3 dbi gain.

$$FSP = 20 \log (10) + 20 \log (2.4) + 32.45 = 20 + 7.6 + 32.45 = 60.05$$

$$\text{Rx power} = \text{AP power} - \text{cable loss} + \text{AP antenna gain} - \text{FSL} + \text{Laptop antenna gain} \\ = 36 - 0.3 + 5.2 - 60.05 + 3 = -16.15 \text{ dbm}$$

$$\text{Dbm} = 10 \log \text{mw}$$

$$P = 10^{-1.615} = 0.0243 \text{ mw}$$

$$FSP = 20 \log d(\text{meters}) + 20 \log f(\text{GHz}) + 32.45$$