King Saud University
College of Engineering
Electrical Engineering Department
Communication Systems

Course: Communication Systems — Course code: EE 424
Credit Hours: 3 — Instructor: Adel A. Ali
Test #3 — **Time: 50 minutes**

Student Name — Student ID

State three types of repeaters used in WM radio links, what are the main applications of each?

Repeater Type	Application
1.	
2.	
3.	

4. Doubling the hop distance increases antenna heights by…….. dB

5. What is the main reason for using FM instead of AM in MW LOS radio-link systems?
   ……
   ……
   ……
6. What is the difference between attenuation and fading in MW LOS radio-link systems?

……
……
……

7. What is the function of the pre-emphasis network used with MW radio systems?
   ……
   ……
   …….

8. Doubling the carrier frequency increases the free space attenuation by……..dB

9. Doubling the carrier frequency increases the link outage time due to propagation by a factor of……...

10. Doubling the hop distance increases the outage time by a factor of……

A microwave radio link operates at an RF carrier frequency of 14 GHz. The base band signal is a color TV, the hop distance is 50 km, the transmitted power is -5 dBW, and the performance objective is a signal-to-thermal noise ratio of 55h dB. Determine the following:

11) Free-space path loss

12) IF signal bandwidth

13) Receiver input noise power

14) Minimum received signal level

15) Antenna gain(s)