713 Quiz 2: April 16th, 2008 Name:_____

Circle the answer that is most correct.

(i) A receiver receives 10^{-12} Watts of signal power, and has a bandwidth of 10 MHz with noise figure 2.5. The receiver operates in a 290 K external noise environment. The signal to noise ratio for this system is approximately

(a) 2.3 (b) 10 (c) 16.7 (d)59.8 (e) none of the above

(ii) The amount of atmospheric gas attenuation encountered on a 10 km horizontal path (at sea level) when operating at 30 GHz is approximately

(a) 0.02 dB (b) 0.24 dB (c) 0.9 dB (d)2.5 dB (e) none of the above

(iii) A rain rate of 35 mm/hr in Miami, FL would be exceeded approximately what percent of the year?

(a) 0.1 (b) 0.2 (c) 0.5 (d)1.0 (e) none of the above

(iv) A communications system has a 6 GHz transmitter with gain 20 dBi that transmits 50 Watts of power to a receiver 5 km away. The receiver has antenna gain 3 dBi, and it can be assumed that the system is polarization and impedance matched, and that the antennas are directed towards each other. Modeling the propagation environment as free space, the power received is:

(a) -50 dB,W
(b) -82 dB,W
(c) -93 dB,W
(d) -114 dB,W
(e) none of the above