ITS323 – Quiz 2

Question 1 [3 marks]

a) Draw a plot of the following signal in the frequency domain. [2 marks]

 $s(t) = 5\sin(4000 \pi t) + \frac{5}{3}\sin(12000 \pi t) + \sin(20000 \pi t)$

b) What is the absolute bandwidth of the signal? [1 mark]

Question 2 [1 mark]

Parabolic dish antennas that operate at a high frequency have a lower gain than those of the same size that operate at a low frequency TRUE FALSE

Question 3 [4 marks]

An encoding scheme maps 3 bits of digital data into one signal element.

a) In a noise-free channel with a bandwidth of 20KHz, what is the maximum theoretical data rate possible? [2 marks]

- b) Explain how the data rate can be increased, without increasing the bandwidth. [1 mark]
- c) What is a disadvantage of increasing the data rate with the approach you suggest in part (b)? [1 mark]

Question 4 [2 marks]

The path between SIIT Bangkadi and SIIT Rangsit is measured to have a power loss of 100dB. Both transmit and receive antenna's are identical, with a gain of 10dBi. Using a transmit power of 0.1W, what is the maximum receive power threshold for successful reception?