

Question 2 [3 marks]

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

$$s(t) = 40\sin(180\pi t) + 5\sin(360\pi t) + 2\sin(400\pi t) + \sin(500\pi t)$$

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

Question 3 [3 marks]

A receiver receives a 200kHz signal with power 310μW.

a) If the channel also contains noise of 10μW, what is the theoretical data rate possible? [2 marks]

b) Assuming the noise cannot be controlled, explain how can the data rate be increased, without increasing the bandwidth. [1 mark]