

MULTIMEDIA SYSTEMS ASSIGNMENT 1

DUE DATE: THURSDAY 20TH MARCH 2025

1. Sketch the developments in multimedia. What do you expect to be the commercial impact of multimedia in the (near) future? (4 marks)
2. Discuss the factors that play a role in the development of multimedia information systems. What research issues are there? When do you expect the major problems to be solved? (6 marks)
3. What role do standards play in multimedia? Why are standards necessary for compression and delivery. Discuss the Nyquist Sampling Theorem and indicate how it is related to other (possible) standards. (4 marks)
4. Discuss the considerations you would have when designing an architecture for a multimedia information system. Discuss the tradeoffs involved. (6 marks)
5. An analog signal has a bandwidth that ranges from 45Hz to 15 KHz. What is the rate of sampling and the bandwidth of bandlimiting filter required if:
 - i. The signal is to be stored within computer memory.
 - ii. The signal is to be transmitted over a duplex network connection which has a bandwidth from 1500Hz to 2.1KHz.(6 marks)
6. Assuming that each signal is sampled at 8 bits per sample, what is the quantisation noise and the signal to noise ratio (SNR) expected for the transmission of the signals in (i) and (ii) above.
Explain the implication of the level of the quantisation noise and the signal to noise ratio (SNR) for the transmission. (8 marks)
7. Briefly explain the implications of Sampling Rate and Bit Size in the digitization process. (4 marks)
8. For each respective modality audio, photographic image and digital video give one example of a possible source of noise and how this noise might manifest itself in the data.

(6 Marks)