COMPUTER SCIENCE TRIPOS Part IB – 2025 – Paper 5

1   Computer Networking (awm22)

Analyze the fundamental aspects of error control in digital communication systems.

(*a*) Describe, compare, and contrast Forward Error Correction (FEC) and Error Detection and Retransmission (ED&R) in terms of their bandwidth utilisation and delay characteristics.   [6 marks]

(*b*) A streaming video service needs to implement error control mechanisms. Explain how the channel properties, latency, reliability, and available bandwidth, would influence the choice between FEC and ED&R.   [8 marks]

(*c*) (*i*) Consider a CRC polynomial used for error detection: outline the design capability, implementation, and limitations.   [3 marks]

(*ii*) Compare and contrast two retransmission strategies for a system implementing ED&R.   [3 marks]