**review topic sheet**

(Can be used as a guide in your studies so you don't leave things out of your review. Should be used in conjunction with the review lecture recording. Not a list to memorize definitions, be able to explain how each of these work and their advantages anddisadvantages/limitations)

* Transmission delay, Propagation delay (be able to calculate, use and understand difference) 1
* C/S vs P2P – performance, differences Socket programming (explain; but not write code)
* TCP
* UDP
* SMTP behaviour
* DNS
  + Iterative and recursive queries
  + role of DNS in the Internet
  + DNS records
* HTTP
  + behaviour (prac)
  + 1.0 vs 1.1 2
  + Caching/proxies 2
  + Persistence 2
  + Pipelining 2
* Differences between OSI & Internet layers
* Transport layer –
  + functions
  + Port numbers and their use in TCP and UDP
  + GBN/SR
    - Pipelining – efficiency
  + Key components of reliable transport: (prac)
    - Window - sizes
    - Sequence number
    - ACKs/NAKs
    - checksums
    - Timeouts – RTT calculation
  + Propagation delay, transmission delay, queuing delay, processing delay
  + TCP Congestion control
    - Slow start
    - Congestion avoidance
    - Fast retransmit, fast recovery
  + Flow control
  + Connection establishment and termination
* Network layer –
  + functions
  + Algorithms –
    - link state vs distance vector
    - Dijkstra Distance Vector
    - How they work
    - Performance, advantages and disadvantages
  + Classfull addressing and CIDR
  + Subnetting
  + Inter intra AS routing
  + DHCP
  + Unicast, multicast, anycast
  + Fragmentation
  + IPv6
    - What is different to IPv4 and why Transitioning to
* Link layer –
  + functions
    - Error correction/detection - (checksum,CRC, parity - 1D and 2D)
  + cycles and spanning tree
  + Multiple access approaches
    - Channel Partitioning
    - Random Access
    - Taking Turns
  + LAN topologies
  + Role of switches and how they forward frames
  + ARP
  + CSMA/CD
  + CSMA/CA
  + PPP
    - Byte stuffing
  + MPLS
  + ICMP
  + Traceroute
  + Wireshark
* Security
  + Confidentiality
  + Data integrity
  + Authentication
  + Attacks
  + Nonces
  + Hash functions (sha, md5) –
  + fingerprint Encryption algorithms (3DES, AES)
  + Public key encryption (RSA)
  + Certificate Authorities
  + Secure e-mail
  + SSL
  + IPsec

Reviewing:

* MyMedia recordings of lectures Textbook Podcasts Wireshark labs Tutorial questions, quizzes
* Past exams (last 3 years would be the most relevant) don't just look at answers! If you can't answer the questions then you need to do more review. Exam is not just a selection of these questions. Same concepts - but different questions. Need to understand concept not memorise how to answer questions.
* What to expect: There may be some definitions; but not many (or possibly none) Most will require explaining in your own words how things work
* Focus on key points not lots of wordy description
* Focus on significant differences – e.g. IPv6 has 128bit addresses is not an advantage and shouldn’t be given as a reason for IPv6 (however supporting a much larger address space -> more hosts is an advantage, note the difference between the actual advantage and how it is implemented
* Be ready to answer “what if” questions
* Look carefully for the question being asked - make sure you answer the question asked, not describe the technology mentioned in the question.