

OLLSCOIL NA hÉIREANN
THE NATIONAL UNIVERSITY OF IRELAND, GALWAY

SUMMER EXAMINATIONS 2001

M.Sc. Software Design/Development

Computer Communications CT517

Professor D. Bell
Professor G. Lyons
Mr. H. Melvin

Time allowed: TWO hours

Answer Q1 and any 2 other questions.

All questions carry equal marks

- Q1.** (i) The operation of the Internet is governed by a host of protocols, each delivering a subset of the overall end-user requirement. Discuss this statement using a typical end-user transaction to illustrate your answer.
(18)
- (ii) The Internet was not designed to deliver multimedia data. Briefly discuss this statement outlining what developments have taken place to address this issue.
(7)
- (iii) Briefly evaluate ATM (Asynchronous Transfer Mode) technology focusing in particular on its QoS (Quality-of-Service) features.
(10)
- Q2.** (i) Describe in some detail the operation of the POTS (Plain Old Telephone System), focusing on its use for **voice** transmission.
(15)
- (ii) Briefly describe the requirement for and operation of modem's to facilitate data transfer across the POTS. Explain also how K56 modems can deliver higher datarates than conventional modems.
(10)
- (iii) The bandwidth requirements of domestic Internet users is constantly increasing. Briefly describe **and** evaluate some possible solutions.
(10)

- Q3.** (i) In recent years, Ethernet LANs have greatly surpassed Token Ring LANs in popularity. Describe **and** compare the operation of **both** LAN standards and explain why network administrators are increasingly choosing the former. (18)
- (ii) Evaluate briefly the principal options available to administrators in providing higher-speed LANs. (10)
- (iii) Write a brief note on the recent developments in wireless LANs. (7)
- Q4.** (i) Distinguish between error detection and error correction policies, outlining where each might best be used. (8)
- (ii) Many Internet applications utilise the transport-layer TCP protocol to provide effective data transfer. Describe in some detail how TCP provides this QoS (Quality of Service). (17)
- (iii) DNS (Domain Name System) is a hierarchical, domain-based naming scheme for the Internet utilising a distributed database system. Discuss briefly the need for **and** the operation of DNS. (10)
- Q5.** (i) Network security is becoming an increasingly critical issue, requiring a multi-stranded strategy. Outline the principal threats and an overall security strategy. (10)
- (ii) Describe **and** distinguish between Secret **and** Public Key algorithms, focusing on where each might be used in a security strategy. (15)
- (iii) Briefly summarise the evolution of mobile telephony from 1st to 3rd Generation (3G) and outline the principal objectives of 3G. (10)