

OLLSCOIL NA hÉIREANN
THE NATIONAL UNIVERSITY OF IRELAND, GALWAY

SUMMER EXAMINATIONS 2001

Final Year IEIS (External Repeat)

Computer Communications

Professor D. Bell
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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. (20)
- (ii) Outline the main characteristics of the following transmission media, indicating where each might be used within a network architecture:
- (a) Twisted Pair
 - (b) Coaxial Cable
 - (c) Fibre-Optic Cable
- (15)
- 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.
(20)
- (ii) Evaluate briefly the principal options available to administrators in providing higher-speed LANs.
(15)
- 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) Briefly evaluate the role that the new Internet protocol IPv6 will play in the Internet of the future.
(8)
- (ii) Network security is becoming an increasingly critical issue, requiring a multi-stranded strategy. Outline the principal threats and an overall security strategy.
(15)
- (iii) Describe **and** distinguish between Secret **and** Public Key algorithms, focusing on where each might be used in a security strategy.
(12)