EASTERN UNIVERSITY, SRI LANKA
THIRD EXAMINATION IN SCIENCE 2003/2004
(Proper & Repeat)
SECOND SEMESTER (June/July, 2005)
CS303 - Internet and Multimedia Applications
Answer All Questions

Time Allowed: Two hours

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1. (a) i. List and explain all the components of IPV6 (Internet Protocol version 6) packet. {20}

ii. Explain the most important changes introduced in IPV6 over IPV4. {15}

iii. List the fields appearing in the IPV4 datagram that are no longer present in the IPV6 datagram. Give reasons why they are avoided in the IPV6 datagram. {15}

iv. Briefly describe the 'Tunneling approach', which is used to integrate IPV6 hosts into IPV4 world. {10}

(b) i. Describe the original Internet addressing architecture defining five classes of addresses. {10}

ii. Describe the IP addressing procedure. {10}

iii. Suppose an Internet Service Provider (ISP) may itself have been allocated the address block 200.21.48.0/20. The ISP, in turn could divide its address block into eight smaller address blocks of equal size and give each address blocks to eight organizations named Org-1, Org-2, Org-3, up to Org-8 that are supported by this ISP. Identify the address blocks, which are allocated to each organization. {20}

2. (a) Explain how a web-cache satisfies an HTTP request on behalf of a client. {20}

(b) Describe LAN addresses and Address Resolution Protocol (ARP). {20}

(c) i. List and describe the services provided by Domain Name System (DNS). {30}

ii. Internet host will have at least one local name server and one authoritative name server. What role does each of these servers have in DNS? {15}

iii. Suppose the host ***suresh.eurocom.us*** desires the IP address of ***naresh.cs.esn.edu***. Also suppose that local name server for ***suresh.eurocom.us*** is ***dns.eurocom.us*** and that an authoritative name server for ***naresh.cs.esn.edu*** is ***dns.esn.edu***. Explain how the host ***suresh.eurocom.us*** can get the IP address of ***naresh.cs.esn.edu*** {15}

3. (a) Briefly describe each of the following components of an e-mail system:

i. User Agent {05}

ii. Mail Server {05}

iii. SMTP {10}

iv. IMAP {10}

(b) Describe briefly browser-based e-mail. {10}

(c) State the use of of the following tags in XHTML:

i. $< a >$

ii. $< base >$

iii. $< frameset >$

iv. $< link >$

v. $< script >$ $\{5 \times 3 = 15\}$

(d) Describe how multimedia can be applied in education and training. Discuss the advantages and disadvantages over more conventional methods when it is applied in this area. {15}

(e) The **Lempel-Ziv-Welch (LZW)** compression algorithm replaces string of characters with single code. Give the LZW compression algorithm in its simplest form. {10}

Run the LZW compression algorithm for the string : /ABC/AB/ABB/ABD/ABE, creating the corresponding compression table. {20}

4. (a) Define the term **Socket** in connection with process communication across a network. {15}

(b) Describe the purpose of the class **Socket** and **ServerSocket** defined in the Java package java.net and outline how it can be used. {20}

(c) Describe briefly the socket programming with TCP. {25}

(d) Consider the following client/server application scenario for TCP protocol:

- *A client reads an integer number from its standard input (keyboard) and sends the number out its socket to the server.*
- *The server reads a numbers from its connection socket.*
- *The server calculates the factorial for that number.*
- *The server sends the factorial out its connection socket to the client.*
- *The client reads factorial from its socket and prints the factorial on its standard output (monitor).*

Write client/server Java program pair for a TCP implementation of the above application. The client program is named as **TCPClient.java** and the server program is named as **TCPServer.java**. The user at the client may then use the application to send an integer number and then receive a factorial of the number. $\{2 \times 20 = 40\}$