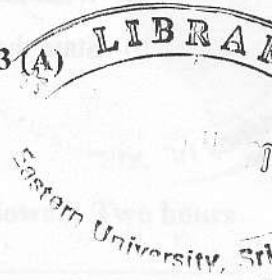


EASTERN UNIVERSITY, SRI LANKA
THIRD EXAMINATION IN SCIENCE 2002/03 & 2002/03 (A)
SECOND SEMESTER (March/April, 2004)

CS 303 - Internet and Multimedia Applications



Answer All Questions

Time allowed: Two hours

Q1

- a) The Internet connects many networks each of which runs a protocol known as TCP/IP (Transmission Control protocol/ Internet Protocol). Draw the block diagram to describe the relation of IP, TCP and UDP (User Datagram Protocol) and explain various protocols involved in each layer. {15}
- b) (i) Draw the IPV6 packet format and explain each component of this packet. {20}
- (ii) Explain most important changes introduced in IPV6 over IPV4. {15}
- (iii) Briefly describe a way to integrate IPV6 hosts into IPV4 world. {15}
- c) (i) Describe the IP addressing procedure. {10}
- (ii) Suppose an Internet Service Provider (ISP) may itself have been allocated the address block 210.20.32.0/19. 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 Org0, Org1, Org2, up to Org7 that are supported by this ISP. Identify the address blocks, which are allocated to each organization. {25}

Q2

- a) Describe briefly *non-persistent* and *persistent* connections, which are used to transfer web pages from server to client. {15}
- b) Describe File Transfer Protocol (FTP) and their commands. {10}
- c) (i) Describe Simple Mail Transfer Protocol (SMTP) of an E-mail system. {15}
- (ii) Describe each of the following mail access protocols: {2 X 10=20}
- POP3
- IMAP
- (iii) Suppose *Raman* having a web-based E-mail account sends a message to *Sitha*, who access her mails from her mail server using POP3. Discuss how the message moves from *Raman's* host to *Sitha's* host. Your answer should include the series of application-layer protocols that are used to move the message between the two hosts. {20}
- d) Describe TELNET. {10}
- e) List the differences between static, dynamic and active web pages. {10}

- Q3
- What are the main differences between HTML and XHTML? {10}
 - State the use of each of the following tags in XHTML: {5 X 4=20}
 - <link>
 - <input>
 - <base>
 - <style>
 - <frame>
 - List the main components of a multimedia system. {10}
 - Define the term “**interactive multimedia**”. {10}
 - The Lempel-Ziv-Welch (LZW) compression algorithm replaces string of characters with single code. Give the LZW compression algorithm in its simplest form. {15}

Run the LZW compression algorithm for the string: /com /compute /computer, creating the corresponding compression table. {20}
 - Describe briefly the image file formats GIF, PNG and JPEG. {15}

Q4

- List the important characteristics of **clients** and **servers**. {15}
- Define the term **Socket** in connection with process communication across a network. {10}
- Describe the purpose of the class **Socket** and **ServerSocket** defined in the Java package **java.net** and outline how it can be used. {15}
- Consider the following client/server application scenario for TCP protocol:
 - A client reads a line from its **standard input** (keyboard) and sends the line out its socket to the server.
 - The server reads a line from its connection socket.
 - The server converts the line to uppercase.
 - The server sends the modified line out its connection socket to the client.
 - The client reads the modified line from its socket and prints the line 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 a line and then receive a capitalized version of the line. {40}

What will happen if you run TCPClient on one host before TCPServer on another host? Give reasons for your answer. {20}