Multimedia Technology II, Assignment 6

Q1. Explain the meaning of the following terms relating to B-ISDN networks: (i) fixed-size cells, (ii) statistical multiplexing, (iii) cell switching, (iv) asynchronous transfer mode.

Q2. Discuss the reasoning behind the choice of a connection-oriented mode of operation for B-ISDN networks and a 53-byte cell size.

Q3. With the aid of a figure showing the cell switching schematic, explain (i) how the header of each cell can be relatively short, (ii) how cells are routed through an ATM switch, (iii) the difference between VP routing and VC routing. Give an example of each routing type.

Q4. With the aid a figure showing the ATM format, explain the use of (i) the payload type field, (ii) the cell loss priority bit, (iii) the header checksum.

Q5. Identify a selection of the applications of the PPP within the Internet. With the aid of a figure showing the PPP frame format, explain the use of the following fields: (i) opening and closing flags with zero bit insertion, (ii) the byte stuffing rules used with asynchronous transmission lines.

Q6. With the aid of a figure showing the network schematic, explain briefly the role of the following network components and protocols: (i) access network gateway, (ii) routing gateway, (iii) Internet protocol (IP), (iv) datagram/packet.

Q7. In relation to the IP datagram/packet format shown in Figure 9.3, explain the role of the following header fields: (i) IHL, (ii) TOS, (iii) Total length and identification, (iv) flag bits, (v) fragment offset, (vi) time-to-live, (vii) protocol, (viii) header checksum, (ix) options.

Q8. Explain why there is no checksum for a whole datagram.

Q9. Assume a message block of 8000 bytes is to be transferred from one host to another as shown in the example in Figure 9.4. In this instance, however, assume the token ring LAN and the Ethernet, respectively, has an MTU of 3000 bytes and 2000 bytes. Compute the header fields in each IP packet shown in the figure as it flows (i) over the token ring LAN, (ii) over the Ethernet LAN.