CS573: Network Protocols and Standards

Evaluation Quiz

Sept 07, 2004 (Time Given=25 minutes)

Name:
Student ID Number:

Purpose of this quiz is to evaluate your preparation for this course. This quiz is designed to be much simpler than the pre-requisite material for this course. How difficult this quiz turns out for you will tell you the level of difficulty you may face in this course. If this quiz is too hard for you, we recommend you consider taking other courses or brush up your skills early in the quarter.

This quiz is for your own evaluation. Turn it in after you finish; we will grade it but it will not be counted towards your performance in this course. Graded quizzes can be picked up from the admin in CS wing (first wing on your left as you enter the academic building from Pepsi Dining Center).

1. In the following, check whatever choices are correct. There can be 0, 1, or more correct choices for each question.

(a) In computer networks, a bit means:
   i. the smallest piece of information to represent a digital signal
   ii. transfer of small amount of information from one place to another
   iii. the minimum amount of power needed to operate a network card

(b) A sliding window is primarily used
   i. to ensure that air passes through router electronics to avoid excessive heating
   ii. to ensure delivery of data with best-effort
   iii. to add reliability to data transfer between two computers
   iv. to increase the efficiency in data transfers

(c) TCP provides:
   i. best-effort data delivery without any guarantees on delay
   ii. guaranteed data delivery without any guarantees on delay
   iii. best-effort data delivery with guaranteed delay
   iv. guaranteed data delivery with guaranteed delay
(d) IP provides:
   i. best-effort data delivery without any guarantees on delay
   ii. guaranteed data delivery without any guarantees on delay
   iii. best-effort data delivery with guaranteed delay
   iv. guaranteed data delivery with guaranteed delay

(e) LAN addresses
   i. are 48 bits long
   ii. are 32 bits long
   iii. are usually used as a replacement to IP addresses
   iv. identify a particular computer
   v. identify a particular network card

(f) There are 3200 computers in a private network. What is the minimum number of bits required to address every computer uniquely on this network?
   i. 48
   ii. 12
   iii. 11
   iv. none of the above

(g) What is a binary tree?
   i. A tree which takes on two colors — green in spring and brown in autumn
   ii. A data structure commonly used in programming languages
   iii. A list of function declarations in C language
   iv. A structure that can’t be changed once initialized
   v. A data structure that can only be used in object oriented languages

2. What is an internet? Just write what you think it is!

3. What is the difference between an internet and the Internet?
4. Using C language, write a function that swaps the two integer values passed to it.

5. Consider the following definition in C language:

```c
struct node
{
    int data;
    struct node* next;
}
```

You are given the pointer to the head (`headptr`) of such a linked list. Write a piece of code to find the number of elements in the linked list and print out the data corresponding to each element.
6. You are implementing a network in C++ and you decide to make a class named \texttt{Router} which simply represents a router in your network. The physical interface through which a router connects to other routers and network devices is called a port and you decide to implement a class named \texttt{Port}. The \texttt{Router} class has a public integer data member \texttt{numPorts} which is set to the number of ports on that router. The \texttt{Port} class has a public member function (or method) named \texttt{void sendData(char data)} which is used to send some character data to other devices.

(a) Assume that you implement a network which has 5 routers. This is accomplished by initializing an array of 5 \texttt{Router} objects; the name of the array is \texttt{routers}, i.e., you have used something like \texttt{Router routers[5];} in your code. Also assume that in your code, you have initialized routers such that the data member \texttt{numPorts} contains the correct number of ports. Write a piece of code that would go somewhere in your \texttt{main()} to find the total number of ports in the network.

(b) Assume that you implement a network which has \texttt{numRouters} routers. Write a piece of code to send character ‘a’ out on all ports of all routers.