Quiz 1:

**Question 1**

Match these network types with examples of each.

|  |  |  |
| --- | --- | --- |
| Public network |  | Correct |
| Circuit switching network |  | Correct |
| Private network |  | Correct |
| Message passing network |  | Correct |
| Packet Network |  | Correct |
| Broadcast Network |  | Correct |

Correct

Marks for this submission: 1/1.

**Question2**

Marks: 1

Why encapsulate data in a packet?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Makes the packet easier to transmit Incorrect |  |
|  | b. Headers direct various layers of the network on how to handle the packet Correct |  |
|  | c. Packets are more secure with large headers Incorrect |  |
|  | d. Headers prevent packet loss Incorrect |  |

Packet data is encapsulated within headers that tell each of the software layers what to do with the packet. The Internet header tells the network where to deliver the packet, the Transport layer tells how to deliver and sequence the packet and so on.

Correct

Marks for this submission: 1/1.

**Question3**

Marks: 1

Why didn't the 7 layer model catch on?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. TCP/ IP was too complex Incorrect |  |
|  | b. TCP/IP was free and readily available in Berkeley Software Distribution of UNIX Correct |  |
|  | c. ISO Didn't have an Internet layer Correct |  |
|  | d. 5 is better than 7 Incorrect |  |

In truth the reason ISO failed was that TCP/IP was free and available from BSD (free UNIX from Berkeley) and people started using it. No amount of government pushing could make other protocols cheaper or simpler. Free always beats proprietary -- always.

Correct

Marks for this submission: 1/1.

**Question4**

Marks: 1

Why do we describe the TCP/IP protocol as layered?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Layers make the software run faster Incorrect |  |
|  | b. Layers are easier to draw Incorrect |  |
|  | c. Layers separate functions into clear and simple components Correct |  |
|  | d. Layers add to security of the software Incorrect |  |

Layers break a large complex system into simple understandable components. We can change one layer without affecting other layers so long as the layer we change still provides the same services to the layer above and below.

Correct

Marks for this submission: 1/1.

**Question5**

Marks: 1

What is a Packet?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. A short burst of binary information with a standard size and format Correct |  |
|  | b. Binary data Incorrect |  |
|  | c. Data converted to computer readable format Incorrect |  |
|  | d. Binary data converted to electrical 1's and 0's (high and low voltages, for example) Incorrect |  |

Data comes in many forms: large files of movies, small files of e-mail messages (SMS) and all the sizes in between. A network cannot anticipate the size of the files it will receive from a host, so we break the data into standard size packets of about 1500 bytes (one page of typing). These packets are sent one at a time down the wire until the entire file is received at the far end. The network doesn't care what's in the packet

Correct

Marks for this submission: 1/1.

**Question6**

Marks: 1

What is the purpose of the ISO Presentation Layer?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Send data to computers that have Power Point installed Incorrect |  |
|  | b. Verify that the receiving computer is capable of presenting the transmitted data Incorrect |  |
|  | c. Make data available for presentations Incorrect |  |
|  | d. Transform data into the form that the application layer can accept. Correct |  |

This layer provides independence from differences in data representation (e.g., encryption) by translating from application to network format, and vice versa. The presentation layer works to transform data into the form that the application layer can accept. This layer formats and encrypts data to be sent across a network, providing freedom from compatibility problems. It is sometimes called the syntax layer.

Correct

Marks for this submission: 1/1.

**Question7**

Marks: 1

A private network is:

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. A network created and restricted to one office, home or enterprise. Correct |  |
|  | b. A network that handles only private data Incorrect |  |
|  | c. A network operated for private benefit Incorrect |  |
|  | d. A network available to subscribers and handles private information Incorrect |  |

Your home network or Augsburg's network is a private network. We paid for it, we run it and we decide who can use it.

Correct

Marks for this submission: 1/1.

**Question8**

Marks: 1

A public network is?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. A network available in public places such as phone booths Incorrect |  |
|  | b. A network available to any subscriber Correct |  |
|  | c. A network that broadcasts public TV Incorrect |  |
|  | d. A network available to subscribers and handles public information Incorrect |  |

A public network (such as the phone or internet) is available to anyone willing to pay a provider (ISP) for the service. It may handle private information and it is up to the user to prevent that information from being decoded by the public.

Incorrect

Marks for this submission: 0/1.

**Question9**

Marks: 1

What is the purpose of the Transport layer?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. To get faster service on the network Incorrect |  |
|  | b. To put all data into packets Incorrect |  |
|  | c. To separate data into vital and non-vital information Incorrect |  |
|  | d. To make an unreliable network appear reliable by controlling retransmission and time out of packet. Correct |  |

Transport is to get the packet from the source to the receiver. Since the network has unpredictable delays and losses, the job of the transport network is to send packets at a rate that the receiver can handle and get the packets all to the distant station -- make an unreliable network appear reliable.

Incorrect

Marks for this submission: 0/1.

**Question10**

Marks: 1

Fiber optic cable specifications are part of the Physical Layer of the TCP/IP model.

Answer:

True CorrectFalse Incorrect

Any physical specification (wire, voltages, timing, frequencies, light wavelenght, connectors, etc.) are part of th e physical layer.

Correct

Marks for this submission: 1/1.

Quiz 2:

1

Marks: 1

Match these network services with their popular name

|  |  |  |
| --- | --- | --- |
| Texting |  | Correct |
| Vonage |  | Correct |
| European Mobile Phones |  | Correct |
| 3G Phone System |  | Correct |
| Wireless Networking |  | Correct |
| Wi-Fi Networking |  | Correct |

Correct

Marks for this submission: 1/1.

Question2

Marks: 1

DARPA was developed to

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Design effective web pages for military use Incorrect |  |
|  | b. Allow research computers to exchange data easily Correct |  |
|  | c. Provide secure computer networks for the military Incorrect |  |
|  | d. Save money by having only one computer run all of the Army Incorrect |  |

DARPA wanted all of the various research arms of the military to share data and computing resources. By networking together large machines (and they used to fill whole rooms) a researcher in Dayton, Ohio could use data and run processes on a computer in San Jose, California.

Incorrect

Marks for this submission: 0/1.

Question3

Marks: 1

What is the difference between the graph on figure 2.1 and figure 2.2?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 2.1 is linear and 2.2 is semi-logarithmic Correct |  |
|  | b. 2.1 and 2.2 show different data Incorrect |  |
|  | c. 2.1 is users and 2.2 is number of computers Incorrect |  |
|  | d. They are the same graph drawn differently Incorrect |  |

It is difficult to graph data that changes over many orders of magnitude (powers of 10). 2.1 is a linear graph (both number and year are on a constant scale). 2.2 is logarithmic. The vertical number scale is in powers of 10 where each division is 10 times the number of computers. The horizontal scale is linear (each year is the same width). By the way, all of the book's graphs are crap! There are no units drawn on the vertical or horizontal scale (though they are obvious) and the labelling of the horizontal scale is variable 1981, 85, 90? Don't ever do this.

Incorrect

Marks for this submission: 0/1.

Question4

Marks: 1

What effects has the Internet made on business?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Businesses can obtain supplies from many more supplier than before Partially correct |  |
|  | b. Businesses can reach out to many more customers than before Partially correct |  |
|  | c. Customers can access many more businesses than before Partially correct |  |
|  | d. All of the above Correct |  |

Businesses have more suppliers and customers in their sphere; customers can query many more suppliers than before. The world of business has become global for all. This is an advantage for the customer in that there is more product and more competition. it is also an advantage to the business in that if done right, you can service many more customers. Whether it will lead to the collapse of some businesses is yet to be seen.

Correct

Marks for this submission: 1/1.

Question5

Marks: 1

How many computers are on the Internet now?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Approximately 700,000,000 Incorrect |  |
|  | b. Approximately 1,000,000,000 Incorrect |  |
|  | c. Approximately 1,200,000,000 Incorrect |  |
|  | d. More than 1,500,000,000 Correct |  |

According to the Computer Industry Almanac there were 1.2 billion Internet computers in 2005. There should be at least 1.5 billion by now.

Correct

Marks for this submission: 1/1.

Question6

Marks: 1

It looks like Telephone and TV are switching to Internet Protocol (IP). Why?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. IP can handle many different kinds of data faster than other protocols Incorrect |  |
|  | b. IP is faster than traditional phones and TV cable Incorrect |  |
|  | c. IP is non proprietary so everyone has found a use for it Correct |  |
|  | d. IP saves money Correct |  |

Since IP is non proprietary there is no mega company collecting ransom (royalties) every time someone uses the network. Free is always better and when IP came along everyone wrote applications for it. This means there is a larger user base and so anything created for its use is cheaper. $ is the answer to most technology questions -- remember VHS beat Betamax because it was cheaper not better.

Incorrect

Marks for this submission: 0/1.

Question7

Marks: 1

Multimedia means:

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Multiple pictures sent at the same time Incorrect |  |
|  | b. Sound and pictures sent together Incorrect |  |
|  | c. More than one sound sent at a time Incorrect |  |
|  | d. Text, pictures, movies, graphs, and sound sent together Correct |  |

Multimedia requires that systems be able to communicate and display text, video, sound, movies and such. Multimedia in computers is not like multimedia in art, but close. We will discuss how different forms of graphics need different networking later when we talk about data transport.

Correct

Marks for this submission: 1/1.

Question8

Marks: 1

The main reason for networking computers is?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. To provide faster service to remote computers Incorrect |  |
|  | b. To share resources Correct |  |
|  | c. To save the cost of multiple display screens Incorrect |  |
|  | d. To give everyone access to everyone else's computer Incorrect |  |

Networking allows us to share resources: printers, data, storage systems, etc. We only need one copy of any resource and everyone can use it.

Correct

Marks for this submission: 1/1.

Question9

Marks: 1

Social networks such as facebook, myspace and second life developed later than e-mail and web pages because?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. New networking protocols had to be developed for these services Incorrect |  |
|  | b. New programming languages had to be developed for these services Incorrect |  |
|  | c. New computer hardware had to be developed for these services Incorrect |  |
|  | d. They just took time to catch on and replaced other social networks such as bulletin boards and news groups. Correct |  |

Social networking just evolved from e-mail and bulletin boards as users and providers found more convenient ways to present the interactions of others. No new network or computer or language had to be developed.

Incorrect

Marks for this submission: 0/1.

Question10

Marks: 1

Universal access to the Internet is considered vital to the education and growth of the U.S.

Answer:

True CorrectFalse Incorrect

Politicians have made much of the Internet as the magic bullet to bring us all up the the millionaire genius level so they want us all on the Internet. Congress taxes phones in urban areas so rural areas have cheap Internet and lots of money is spent trying to get all the schools on the Internet. It is great press, but has little to show as far as improvements in schools and businesses.

Correct

Marks for this submission: 1/1.

Quiz 3:

1

Marks: 1

|  |  |  |
| --- | --- | --- |
| Socket() |  | Correct |
| Send() |  | Correct |
| Recv() |  | Incorrect |
| Bind() |  | Correct |
| Listen() |  | Correct |
| Accept() |  | Correct |

Partially correct

Marks for this submission: 0.83/1.

Question2

Marks: 1

How can you tell the difference between a client and server?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Servers run on large, fast computers Incorrect |  |
|  | b. Servers send data to clients Incorrect |  |
|  | c. Servers run all the time, accepting connections from clients Correct |  |
|  | d. Clients are simpler programs than the servers Incorrect |  |

The differentiation between client and server is very fuzzy. In general servers are pieces of software that run continuously on a 24/7 computer. (I will explain why this isn't really true). Once a client makes a request to connect to a server, the server wakes up and connects to the client. They can exchange information (both ways) and then either the client or server can sever the connection. In some cases, a server becomes a client to another server. For e-mail you connect to a MTA (usually mailman) and then the mailman program contacts another mailman program to pass the message onto its final destination.

Correct

Marks for this submission: 1/1.

Question3

Marks: 1

A concurrent server:

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Can handle many different client requests by creating a new thread for each client/request Correct |  |
|  | b. Processes one client request at a time and all others wait their turn Partially correct |  |
|  | c. Only connects to one client at a time Incorrect |  |
|  | d. Remains connected to all clients all the time Incorrect |  |

A server may get many requests from many clients. A concurrent server creates a new thread for each client (usually) and that thread responds to all the client's requests. Of course, the CPU is really running on thread at a time, but the Operating System organizes many threads to each run independently.

Correct

Marks for this submission: 1/1.

Question4

Marks: 1

An example of a connected application on the Internet is?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Quicktime Streaming Partially correct |  |
|  | b. Web Browsing Correct |  |
|  | c. E-mail Incorrect |  |
|  | d. Instant Messaging Correct |  |

Most Internet applications use a connected protocol to exchange data. Even most streaming protocols (ie multimedia) use connected protocols to ensure that the receiving station is really still there. E-mail requires connections only between intermediate stations and not the end point hosts. IM uses a connected protocol with some intermediate stations to hold the message until the destination host (maybe your cell phone) is connected so IM is not a strict "connected" protocol.

Incorrect

Marks for this submission: 0/1.

Question5

Marks: 1

An example of a connectionless Internet application is?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Web browsing Incorrect |  |
|  | b. E-mail Correct |  |
|  | c. Quicktime streaming Incorrect |  |
|  | d. Remote login Incorrect |  |

E-mail transport of messages is a message passing system but does not require you to be connected to the remote machine for the protocol to work. Intermediate machines store and forward the message until you connect and retrieve your messages.

Incorrect

Marks for this submission: 0/1.

Question6

Marks: 1

What is the purpose of the gethostbyname() function in the socket() API?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Gets a new name for your host computer Incorrect |  |
|  | b. Converts a name to IP number by using the Domain Name Service Correct |  |
|  | c. Converts a name to IP number using a database on your computer Incorrect |  |
|  | d. Converts an IP number to a host name on the internet Incorrect |  |

Gethostbyname() is used extensively by web browsers, etc. You type in [www.augsburg.edu](http://www.augsburg.edu/) and it returns 141.224.64.97, the IP number of the Augsburg web server. Since this data is not on your computer, you machine has to go out onto the Internet (usually to a machine on your local area network) that speaks Domain Name Service (DNS). That machine may know the IP number of [www.augsburg.edu](http://www.augsburg.edu/) or it may have ask other DNS machines on the Internet where that number might be.

Correct

Marks for this submission: 1/1.

Question7

Marks: 1

What is the purpose of putting INADDR\_ANY in a socket address?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Allows the server to connect to any outside IP number Incorrect |  |
|  | b. Allows the client to connect to any server Incorrect |  |
|  | c. Allows the socket to use any IP address of that host computer Correct |  |
|  | d. Allows the server to connect to only one client Incorrect |  |

We could specify that a socket() only allow connections to one local IP number from any remote IP number, but to be more flexible, the API allows the socket() to use any local IP number. This allows a single server to have many IP numbers and was useful when we used a different IP number for each web site. We have an alternate way of doing this now. The browser (client) requests a web page from a server and puts the name of the expected web site in the GET request. The web server then creates a unique connection between the requesting browser and the specific web page requested.

Incorrect

Marks for this submission: 0/1.

Question8

Marks: 1

The Socket API provides:

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. A standard packet for all Internet traffic Incorrect |  |
|  | b. A source of power for the Internet connection Incorrect |  |
|  | c. The user interface to Internet packets Incorrect |  |
|  | d. A standard set of high level language routines (Java, C, ...) that allow your program to use IP. Correct |  |

Socket() API is a standard set of Java or c routines that you use in a program to connect to and transfer data using Internet Protocol (IP)

Incorrect

Marks for this submission: 0/1.

Question9

Marks: 1

A socket descriptor is?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. A number which is the unique number of the socket when you call socket(). Correct |  |
|  | b. A description of the protocol used by socket() Incorrect |  |
|  | c. A link to the status of a socket() Incorrect |  |
|  | d. An integer describing the status of a socket() Incorrect |  |

I/O in the socket() API is conducted by calling socket() and receiving back an integer. That integer is provided by the operating system and is a unique number for that particular connection (from host to host). If you read or write data from that network connection, you use the socket number to tell where to read or write.

Correct

Marks for this submission: 1/1.

Question10

Marks: 1

A socket() is always closed by the host computer that creates it.

Answer:

True IncorrectFalse Correct

Either end of an IP connection can issue the close() command and terminate a socket. If the server has nothing more to say , it closes the socket. If the client is done with the socket, it closes the socket. Once one of the ends closes the socket, the other end closes as well. The only problem here is if you just pull the wire out of the back of your computer with open sockets. If the application is not timing the socket (the socket itself has no time limit) on your computer, those sockets will remain open until you shutdown the calling application or shutdown your computer. For this reason, you should always kill your e-mail client and web browser before turning off your computer.

Correct

Marks for this submission: 1/1.

Quiz 4:

1

Marks: 1

How does your web browser know whether a requested web page has changed?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. The browser compares the page it received last time from the server Incorrect |  |
|  | b. The browser checks its CACHE and if the page is there it uses the page in the CACHE Incorrect |  |
|  | c. The browser issues a HEAD request and sees if the page has been modified since it was stored in the CACHE. Correct |  |
|  | d. Browsers always get new versions of the home page and assume the rest of the pages may change. Incorrect |  |

Browsers cache the pages they receive. If they find the page already in the CACHE they issue a HEAD request which gets you the Last-Modified date of the requested page. If the page in the CACHE is still up to date the browser uses the local page. If it is not, the browser requests a new copy of the page. This was especially important in the era of slow networks, but now is a little less important as most of the web pages are dynamic and always updating.

Correct

Marks for this submission: 1/1.

Question2

Marks: 1

The purpose of DNS is to:

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Convert Internet names to IP numbers Correct |  |
|  | b. Give simple computer access to the Internet Incorrect |  |
|  | c. Convert ethernet numbers to IP numbers Incorrect |  |
|  | d. Convert Internet names to ethernet and IP numbers Incorrect |  |

DNS is a distributed database of Internet names and IP numbers. You ask it for the IP number of [www.dork.com](http://www.dork.com/) and it returns the number. It can do this in reverse as well.

Correct

Marks for this submission: 1/1.

Question3

Marks: 1

Where is DNS server for augsburg.edu and what is its IP number?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Augsburg's ISP visi.com, 66.254.98.138 Incorrect |  |
|  | b. Augsburg's ISP visi.com 141.224.68.1 Incorrect |  |
|  | c. Augsburg, 141.224.0.0 Incorrect |  |
|  | d. Augsburg 141.224.68.1 Correct |  |

Our DNS server is here on campus and can be found by asking for any augsburg.edu address. The response I got was:  
  
;; AUTHORITY SECTION:  
augsburg.edu. 7200 IN NS ns2.dartmouth.edu.  
augsburg.edu. 7200 IN NS ns3.augsburg.edu.  
augsburg.edu. 7200 IN NS ns4.augsburg.edu.  
augsburg.edu. 7200 IN NS ns1.augsburg.edu.  
augsburg.edu. 7200 IN NS ns2.augsburg.edu.  
  
;; ADDITIONAL SECTION:  
ns1.augsburg.edu. 7200 IN A 141.224.68.1  
ns2.augsburg.edu. 7200 IN A 141.224.68.6  
ns2.dartmouth.edu. 188125 IN A 129.170.16.4  
ns3.augsburg.edu. 7200 IN A 141.224.64.41  
ns4.augsburg.edu. 7200 IN A 141.224.64.136  
  
We have 5 nameservers and 1 of them is at Dartmouth College.

Incorrect

Marks for this submission: 0/1.

Question4

Marks: 1

When you make an FTP connection, how many IP and port numbers are involved?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 2 IP, 2 Ports (one IP and one Port on each end) Incorrect |  |
|  | b. 4 IP and 2 Ports (two IP's at each end and one Port at each end) Incorrect |  |
|  | c. 1 IP and 1 Port (same on both ends) Incorrect |  |
|  | d. 2 IP and 4 ports (1 IP on each end and 2 ports as there are two connections made between machines) Correct |  |

FTP creates two separate TCP connections between the host computers involved in the FTP. One connection is for data to flow (the actual transfers). The other connection controls the flow of data and the program at both ends. Thus there are two IP numbers (the two computers at the ends) and 4 port numbers (one port on each end on each connection).

Correct

Marks for this submission: 1/1.

Question5

Marks: 1

The purpose of the href parameter in HTML is?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Indicates where reference material is located Incorrect |  |
|  | b. Indicates a header reference Incorrect |  |
|  | c. Indicates a link to another URL Correct |  |
|  | d. Indicates a link to another web page Partially correct |  |

href is a tag to indicate that this anchor links to another URL. The URL can point to data, web pages, movies or just about anything that a URL can provide.

Correct

Marks for this submission: 1/1.

Question6

Marks: 1

Page 66, figure 4.14 shows a configuration of an e-mail system. What programs to handle e-mail are running on the "server at ISP" machines?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. E-mail web server Partially correct |  |
|  | b. POP server Partially correct |  |
|  | c. IMAP server Partially correct |  |
|  | d. Mail Transfer Agent Partially correct |  |
|  | e. All of the above Correct |  |

The ISP server usually runs all of these programs. MTA's transfer mail among ISP's. POP and IMAP give personal computers access to their e-mail on their computer. Web mail allows any user to access e-mail using a web browser.

Correct

Marks for this submission: 1/1.

Question7

Marks: 1

What is the purpose of the DNS MX record?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. LIsts the IP number of multimedia machnes Incorrect |  |
|  | b. List the IP numbers of multiplexed systems Incorrect |  |
|  | c. List the IP numbers of machines that speak SMTP Correct |  |
|  | d. List the IP numbers of all users that have e-mail Incorrect |  |

Since e-mail addresses are petit@augsburg.edu we have to have a way to find the machine at Augsburg that speaks SMTP to take mail in from the outside world. The MX record lists the IP number of all the mail servers on campus and directs MTA's to direct their mail transfers there.

Incorrect

Marks for this submission: 0/1.

Question8

Marks: 1

How secure is SMTP as described in the book?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Not secure because anyone can hear your plain language transfer Correct |  |
|  | b. Partially secure because only the Mail Transfer Programs can hear the messages Incorrect |  |
|  | c. Somewhat secure since e-mail goes only to certain hosts Incorrect |  |
|  | d. Fully secure since it is encrypted in transfer Incorrect |  |

Email is totally open to any listener. Messages are transfered in plain language from computer to computer and can easily be intercepted. Never use e-mail for any personal information.

Correct

Marks for this submission: 1/1.

Question9

Marks: 1

The apache web server returns a status code with each response. What is the purpose of that status code?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Indicates the status of the server Incorrect |  |
|  | b. Indicates that the request was valid Correct |  |
|  | c. Indicates the status of the Internet at the server Incorrect |  |
|  | d. Indicates that data is valid Incorrect |  |

Every request to the server is interpreted by the server and if it can figure out your request it sends back a status of 200. If it cannot figure out what you asked it sends back a 400 or 404. This is a measure of whether your request was correctly formated and the server has such an item to send.

Incorrect

Marks for this submission: 0/1.

Question10

Marks: 1

Why put all those extra tags around the data in an XML document?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. It makes it so that a program can figure out what the data is (eg. name, address, ...) Correct |  |
|  | b. It makes it easier to display on a web page Incorrect |  |
|  | c. It makes it easier to type Incorrect |  |
|  | d. You can make mailing labels easier Partially correct |  |

XML tags give meaning to any data. That is, if I send you $5.00 what does that mean? If I send it with a TAX tag around the $5.00 you know that is the TAX amount. Programs then can take data and put it correctly into databases and applications.

Correct

Marks for this submission: 1/1.

Quiz 5:

1

Marks: 1

Match these communication components with their function:

|  |  |  |
| --- | --- | --- |
| Convert analog to digital |  | Correct |
| Encrypt data |  | Correct |
| Convert from one electrical signal to another |  | Correct |

Correct

Marks for this submission: 1/1.

Question2

Marks: 1

What can cause communication systems to deliver data to the receiver that is not identical to that transmitted by the sender?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Interference from other signals Partially correct |  |
|  | b. Signal loss due to long transmission distances Partially correct |  |
|  | c. Overloaded data channels Partially correct |  |
|  | d. All of the above Correct |  |

All of the above can degrade the electrical signal and cause errors in the received data.

Correct

Marks for this submission: 1/1.

Question3

Marks: 1

A common example of a demultiplexor is:

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Cell phone Incorrect |  |
|  | b. AM Radio Correct |  |
|  | c. Desktop computer using wired networking Incorrect |  |
|  | d. A home router Incorrect |  |

A common AM radio takes inputs from a wide range of frequencies and selects one channel for amplification to the speaker.

Correct

Marks for this submission: 1/1.

Question4

Marks: 1

A single ethernet cable is an example of:

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Time dvision multiplexing Correct |  |
|  | b. Space division multiplexing Incorrect |  |
|  | c. Frequency division multiplexing Incorrect |  |
|  | d. Packet multiplexing Incorrect |  |

Ethernet has only a single channel on a wire. Since every signal must go over the same wire each has to wait its turn to travel down the wire. Each signal is separated by time much like box cars on a train, one right after the other.

Incorrect

Marks for this submission: 0/1.

Question5

Marks: 1

Figure 5.3 shows the conceptual framework for communication. Why to we merge all of the various information channels into one physical channel?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. The cost of the physical channel is shared by all users to reduce the price to each user Correct |  |
|  | b. One physical channel can handle an unlimited number of information channels Incorrect |  |
|  | c. Physical channels carry binary data where information is in many different forms Incorrect |  |
|  | d. Physical channels run faster with digital information than with analog information Incorrect |  |

Usually the physical channel is a long distance data line, a satellite link an undersea fiber optical cable. All of these are expensive and usually can handle more information than from one source. To reduce the cost to any one user the physical media is shared by many users.

Correct

Marks for this submission: 1/1.

Question6

Marks: 1

Multiplexors perform the following function:

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Separate information channels into many physical channels Incorrect |  |
|  | b. Convert analog data into digital data Incorrect |  |
|  | c. Convert binary data into packets Incorrect |  |
|  | d. Merge many digital data streams into one stream for transmission Correct |  |

Multiplexors take many input channels and merge them into one stream of data for transmission over a single physical channel.

Correct

Marks for this submission: 1/1.

Question7

Marks: 1

This chapter claims that all communication occurs using physical media. Which of the following is NOT a physical medium.

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Fiber optic cable Incorrect |  |
|  | b. Copper twisted pair Incorrect |  |
|  | c. TCP/IP protocol Correct |  |
|  | d. Radio signals Incorrect |  |

Physical media includes nothing. Yes, optical cables, copper wires and Cat 5 UTP cable are all things you can touch, but we can also communicate using electromagnetic signals thru a vacuum. There is nothing physical there but it is considered a physical media.

Correct

Marks for this submission: 1/1.

Question8

Marks: 1

A radio receiver is an example of:

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Time division multiplexing Incorrect |  |
|  | b. Packet multiplexing Incorrect |  |
|  | c. Space division multiplexing Incorrect |  |
|  | d. Frequency division multiplexing Correct |  |

The radio spectra separates signals by frequency WCCO is at 830 Khz, KSTP at 1500 Khz. This separates many different signals by frequency and allows all to be broadcast simultaneously using the same media.

Correct

Marks for this submission: 1/1.

Question9

Marks: 1

Analog communication has lost to digital communication because analog is too slow to send information long distances.

Answer:

True IncorrectFalse Correct

The analog to digital transition has nothing to do with speed. It has more to do with storage and transmission systems that can store and forward digital data with minimal errors. Analog signals degrade easily with transmission or storage and eventually will not be the same as the signal originally created.

Correct

Marks for this submission: 1/1.

Question10

Marks: 1

Analog information cannot be converted to digital. Information must start as digital to be sent over a digital communication system.

Answer:

True IncorrectFalse Correct

Pictures, voices, temperature, etc. are all analog information sources. To use in a digital communication system, the analog signal must be converted to digital, but it works like any other information once converted.

Correct

Marks for this submission: 1/1.

Quiz 6:

1

Marks: 1

Match the information source against its type

|  |  |  |
| --- | --- | --- |
| Singing |  | Correct |
| Light switch |  | Correct |
| Temperature |  | Incorrect |
| Auto Head Lights |  | Incorrect |
| Wind Speed |  | Correct |
| Speech |  | Correct |

Partially correct

Marks for this submission: 0.67/1.

Question2

Marks: 1

An analog to digital converter is used at the recording studio to convert music across the full range of you hearing. How many samples per second must this converter do to be able to reproduce the full audio spectrum?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 1,000,000 samples/second Incorrect |  |
|  | b. 30,000 samples/second Correct |  |
|  | c. 20,000 samples/second Incorrect |  |
|  | d. 7,000 samples/second Incorrect |  |

The audio spectrum is 0 to 15 Khz with a maximum frequency of 15 Khz. Nyquist's theorem says you must sample at least twice as fast as the highest frequency so you must sample at least 30,000 samples/second to reproduce the full audio spectrum.

Correct

Marks for this submission: 1/1.

Question3

Marks: 1

Much as I hate to ask this, I will give it a try.   
  
A modem has 16 different phase/level combinations that are each unique. It changes to a new phase/level combination 9,600 time/second. What is the Bit Per Second rate of this modem.   
  
That is levels = 16  
and baud = 9600 / second

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 9600 bits/second Incorrect |  |
|  | b. 38,400 bits/second Correct |  |
|  | c. 76,800 bits/second Incorrect |  |
|  | d. 153,600 bits/second Incorrect |  |

The bit/second rate of a modem is baud (9600) times log2(levels). Levels = 16, Log2(16) = 4   
  
Bit/second = 4 \* 9600/second = 38,400 bits/second

Correct

Marks for this submission: 1/1.

Question4

Marks: 1

Why do we compress the data used in communications?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Save time in transmitting the information over a limited bandwidth system Correct |  |
|  | b. Save disk storage in the intermediate systems along the Internet Partially correct |  |
|  | c. Makes the data easier to display at the recieving end Incorrect |  |
|  | d. Allows for more complex graphics and video. Incorrect |  |

I'll give you partial credit for saving disk storage space, but the real reason to compress is to have the same information represented by fewer bits. Fewer bits means the data arrives at the destination in less time as there are fewer data packets to put on the internet.

Correct

Marks for this submission: 1/1.

Question5

Marks: 1

The Fourier Transform does what?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Converts signals from the time domain to the frequency domain Correct |  |
|  | b. Converts signals between two different frequency domains Incorrect |  |
|  | c. Converts signals from the frequency domain to the energy domain Incorrect |  |
|  | d. Transforms signals into simple sine waves. Incorrect |  |

The Fourier Transform takes a signal in the time domain (a sine wave for example) and converts it into the frequency domain (a single vertical line on the graph). This is how the spectrum is created on a graphic equalizer (look at the little dislplay at the top of iTunes) by measuring the amplitude of the sine wave in many different frequency bands.

Incorrect

Marks for this submission: 0/1.

Question6

Marks: 1

A single sine wave at 1 Megahertz in the time domain would show up in the frequency domain as?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. A broad graph from 0 to 1 Mhz Incorrect |  |
|  | b. A single vertical line at 1 Mhz Correct |  |
|  | c. Vertical lines from 0 to 1 Mhz Incorrect |  |
|  | d. A family of vertical lines centered at 1 Mhz Incorrect |  |

A pure 1 Mhz sine wave shows up as a single vertical line at 1 Mhz on the frequency domain.

Incorrect

Marks for this submission: 0/1.

Question7

Marks: 1

Manchester encoding synchronizes the transmitter and reciever by?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Sending the clock signal on a separate line. Incorrect |  |
|  | b. Adding an extra 1 bit at the beginning of each word Incorrect |  |
|  | c. Never allowing a long string of 1's or 0's Incorrect |  |
|  | d. Putting a transition in the middle of each bit Correct |  |

Manchester encoding adds a transition to the middle of each bit. The transition is up (0 to +) for a 1 and down (+ to 0) for a 0 bit. If the receiver gets out of synchronization it will get to the middle of a bit and find no transition. It will just delay 1/2 a bit time and start over.

Correct

Marks for this submission: 1/1.

Question8

Marks: 1

A sine wave with a period of 10 seconds would have a frequency of?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 100 Hz Incorrect |  |
|  | b. 10 Hz Incorrect |  |
|  | c. 0.1 Hz Correct |  |
|  | d. 0.01 Hz Incorrect |  |

Frequency and period are inverses of each other a 10 second period has a frequency of 1/10 sec or 0.1 second

Correct

Marks for this submission: 1/1.

Question9

Marks: 1

Digital signal synchronization insures?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. The recieved bit stream is identical to the transmitted bit stream Correct |  |
|  | b. The number of bits received is identical to the number transmitted Incorrect |  |
|  | c. The data at the receiver arrives at the same time as transmitted Incorrect |  |
|  | d. The receiver knows what data is being received Incorrect |  |

Since bits are sent at a very rapid rate (1 Ghz on ethernet) we must see that the receiving station data matches up with the sent data. We do that by synchronizing the transmitter and receiver. This is done by adding extra bits or transistions to the transmitted data so the clock on the receiver matches the clock on the transmitter.

Correct

Marks for this submission: 1/1.

Question10

Marks: 1

What are the typical low and high frequency limits of your hearing?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 12 hz, 1 Khz Incorrect |  |
|  | b. 12 hz, 20 Khz Incorrect |  |
|  | c. 50 hz, 15 Khz Correct |  |
|  | d. 0 hz, 150 Khz Incorrect |  |

Your ears are sensitive to frequencies from about 50 Hz to 15,000 hz so your hearing bandwidth is about 15 Khz. Anything outside of that band will not be heard.

Incorrect

Marks for this submission: 0/1.

Quiz 7:

1

Marks: 1

Match the satellite type with its use.

|  |  |  |
| --- | --- | --- |
| Track animals with low power radio transmitter collars. |  | Incorrect |
| TV and Radio Broadcasts |  | Correct |
| Weather monitoring in the Antarctic |  | Correct |
| Satellite Cell Phones |  | Correct |
| Internet |  | Incorrect |
| Weather monitoring in the Tropics |  | Correct |

Partially correct

Marks for this submission: 0.67/1.

Question2

Marks: 1

If you looked down a fiber optic cable in use, what would you see?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. A broad spectrum of white light Incorrect |  |
|  | b. Red light Incorrect |  |
|  | c. Nothing -- the light level is too low to see. Incorrect |  |
|  | d. Nothing, the light is out of the range of your visible sensitivity Correct |  |

Fiber optic cables use infrared light in wavelengths longer than you can see. You would not see anything if you looked down a fiber optic cable.

Correct

Marks for this submission: 1/1.

Question3

Marks: 1

Which is NOT an advantage of the fiber optic cable for network connections?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Fiber is less prone to outside interference Incorrect |  |
|  | b. Optical signals travel further in modern cable before needing applification Incorrect |  |
|  | c. Fiber optical cable can handle data rates much higher than any other medium Incorrect |  |
|  | d. Fiber optic cables are easier to interface with modern computer systems. Correct |  |

Modern fibers allow longer distances and higher data rates with less interference than wired systems. Fiber optical systsems require that we convert the electrical signals in the computers and routers to light via LED's and ILD and then back to electrical signals with Photodiodes or Photocells. This conversion and the difficulty with optical connectors are the major problems that make optical fiber systems expensive and difficult to maintain.

Correct

Marks for this submission: 1/1.

Question4

Marks: 1

From Shannon's Theorem, as noise decreases what happens to C, the effective limit on channel capacity.

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. C doesn't change, noise is not in Shannon's theorem Incorrect |  |
|  | b. C increases as the noise N decreases Correct |  |
|  | c. C decreases as N decreases Incorrect |  |
|  | d. C and N are proportional Incorrect |  |

In the formula C = B log2(1 + S/N) as N, noise increases the value in the () decreases and thus the log decreases and C decreases. You would expect that as the phone line gets noisier, you would understand less and less of what the other person was saying.And as noise decreases C goes up.

Correct

Marks for this submission: 1/1.

Question5

Marks: 1

Some radio waves bend around the earth. We know that because we can hear AM stations from around the U.S. at night. Why don't we hear distant FM stations (like from San Francisco and beyond) at night?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Low frequency AM signals bend and bounce thru the ionosphere. High frequency FM signals do not bounce off the ionosphere but head into deep space. Correct |  |
|  | b. AM singals bounce off clouds and rain, FM signals only bounce off the ionosphere. Incorrect |  |
|  | c. AM stations have more power than FM stations and thus can be heard further. Incorrect |  |
|  | d. AM signals are more easily decoded at very low power and thus your radio can decode them more easily than FM signals at great distances. Incorrect |  |

AM signals are transmitted about 1 Mhz and FM signals about 100 Mhz. The 1 - 5 Mhz signals of the Medium to Short wave bands bounce off the ionosphere and follow the curvature of the earth. The VHF (very high frequency) signals of the FM band pass right thru the ionosphere and do not bounce back to earth.

Correct

Marks for this submission: 1/1.

Question6

Marks: 1

Why twist the wires around each other?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. To prevent interfering signals from penetrating the insulation Incorrect |  |
|  | b. To allow more wires in the same bundle Incorrect |  |
|  | c. To keep pairs of wires together Incorrect |  |
|  | d. To insure that interfering signals are nearly equal on each wire. Correct |  |

By twisting wires together we have the same interference on each wire. The receiving end measures the difference between the wires and if the two wires have the same interference (say 2 volts on each of A and B wires) if we take A-B we get zero for interference.

Correct

Marks for this submission: 1/1.

Question7

Marks: 1

What is the Data Rate for Unshielded Twisted Pair Cat 5 in Bytes/second?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 8 MB/sec Incorrect |  |
|  | b. 12.5 MB/sec Correct |  |
|  | c. 100 MB/sec Incorrect |  |
|  | d. 800 MB/sec Incorrect |  |

UTP Category 5 is rated at 100 megabits/second. Since a byte is 8 bits we have to divide 100megabits/second by 8 bits/byte to get 12.5 MB/sec. Data communication is done as bits/second. Data storage in Bytes. Go figure?

Incorrect

Marks for this submission: 0/1.

Question8

Marks: 1

The text states that the voice phone system has a signal to noise of 30 db and a C of approximately 30,000 bits/second. If the signal to noise ratio is improved to 40 db what is the theoretical C?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 40,000 bits/second Correct |  |
|  | b. 60,000 bits/second Incorrect |  |
|  | c. 300,000 bits/second Incorrect |  |
|  | d. 1,3 Mbits/second Incorrect |  |

If the signal to noise is increased to 40 db then S/N = 10,000. Log2 (10,000) is 13 and 13 x 3000 = 40,000 bits/second. It takes a factor of 10 in noise reduction to get a factor of 30% increase in bit rate.

Correct

Marks for this submission: 1/1.

Question9

Marks: 1

Why are most installed networks still using twisted pair?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Easiest to install Incorrect |  |
|  | b. Cheapest to install Correct |  |
|  | c. Fastest network we have Incorrect |  |
|  | d. Least prone to interference Incorrect |  |

The answer always is cost. Fiber installation is about $1/foot and copper about $0.10 per foot. Since even a small installation is many feet, we normally choose UTP for our network. As fiber and fiber connectors come down in price, more installations will be fiber. In addition, wireless networks are essentially free and will maybe take the place of wired networks in the future.

Incorrect

Marks for this submission: 0/1.

Question10

Marks: 1

Phone lines could be used for high speed Internet connection if we just figured out a clever way to encode the 0's and 1's into signals that would be forwarded down the phone wire.

Answer:

True IncorrectFalse Correct

Shannon's theorem says that as long as we are using real communication systems with bandwidth and noise, there is a strict limit on the effective channel capacity. We have to find another medium with a larger bandwidth if we want to improve on the data rate handled over that of the phone system.

Incorrect

Marks for this submission: 0/1.

Quiz 8:

1

Marks: 1

How does ARQ correct errors?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Hamming Distance correction Incorrect |  |
|  | b. Ask the sender to retransmit the message Correct |  |
|  | c. Ask the sender to retransmit the bad bits Incorrect |  |
|  | d. Ask the sender to use another channel to transmit the message Incorrect |  |

ARQ detects the error (usually by CRC failure) and then either waits until the sender sends a second copy or sends back a non-acknowledgement packet to repeat the bad message completely.

Correct

Marks for this submission: 1/1.

Question2

Marks: 1

The CRC hardware uses the exclusive OR (XOR) function. What does the XOR gate do?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Output 0 if either input is 1 Incorrect |  |
|  | b. Output 0 if either or both inputs are 1 Incorrect |  |
|  | c. Output 1 if either or both inputs are 1 Incorrect |  |
|  | d. Output 1 if either input (but not both) is 1. Correct |  |

Exclusive OR is 1 if either input (but not both) is 1.

Correct

Marks for this submission: 1/1.

Question3

Marks: 1

Forward Error Correction does what with bits received in error?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Detect and correct the error with added bits in the message Correct |  |
|  | b. Forward the error bits onto a server that corrects the bits. Incorrect |  |
|  | c. Use the next bit forward to correct the error Incorrect |  |
|  | d. Remove the error in the forward part of the packet Incorrect |  |

FEC adds bits to the message so that if any bits change (due to noise, distortion or attenuation) the error will be recognized and (possibly) the error corrected.

Correct

Marks for this submission: 1/1.

Question4

Marks: 1

How would you fool a system using parity error checking into thinking that the message has no errors even if bits are changed?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Change 5 bits and the parity remains the same Incorrect |  |
|  | b. Change 3 bits and the parity remains the same Incorrect |  |
|  | c. Change 2 bits and the parity remains the same Correct |  |
|  | d. Parity cannot be fooled by changing bits Incorrect |  |

Parity is a bad error detection system. If you have the pattern 0101 and change it to 1010 the parity remains the same, but the bits mean something completely different. Change any even number of bits and parity cannot detect the error.

Correct

Marks for this submission: 1/1.

Question5

Marks: 1

The idea of error correction in Hamming Distance is to have each transmitted word:

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Expanded with extra bits so that errors will be obvious Incorrect |  |
|  | b. Add extra bits so that more data can be represented Incorrect |  |
|  | c. Add extra bits so that only certain bit patterns are valid. If an invalid pattern is received, pick the one with the fewest changes needed to make it valid. Correct |  |
|  | d. Add extra bits so that any error will yield an invalid, uncorrectable pattern of bits. Incorrect |  |

Hamming Distance error correction says take the bit string and add extra bits so that only certain patterns are valid. If an error occurs, determine the closest valid pattern by changing the fewest number of bits to get to a valid pattern.

Incorrect

Marks for this submission: 0/1.

Question6

Marks: 1

Why does the Internet just toss out bad packets instead of trying to send a message back to the sender to ask for a repeat?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. This takes time and slows the Internet Partially correct |  |
|  | b. The error may be in the internet address so you would send it back to the wrong station Correct |  |
|  | c. The Internet has no error detection while the message is in transit Incorrect |  |
|  | d. The Internet assumes no errors occur Incorrect |  |

Once an error occurs along the path of an Internet message (usually by CRC detection) the message is discarded and no further action is taken. This prevents loading the Internet with error messages. Additionally, if the error occurs in the message address, there is no way to know if you are sending the error response back to the correct sender.

Correct

Marks for this submission: 1/1.

Question7

Marks: 1

In the headers of Internet Packets we will put checksums calculated by the 32 bit "Internet Checksum". If the Internet Checksum is not even calculated, what is transmitted in the header?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. All 0's Correct |  |
|  | b. All 1's Incorrect |  |
|  | c. Not a Number Incorrect |  |
|  | d. minus Infinity Incorrect |  |

Turns out that all of these checksum calculations are a waste of time. I will explain this, but header checksums are really needed. Because of that some systems just send all 0's as the checksums indicating that they didn't even spend the time to calculate the checksum since any error will be caught elsewhere.

Correct

Marks for this submission: 1/1.

Question8

Marks: 1

Why doesn't the Internet use error correction? (I bet you thought after all this techno babble, we would use some of these cleaver error correction system. But there is a very logical reason not to use error correction on the Internet.)

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. The correction may not be correct and you get bad data Correct |  |
|  | b. Error correction takes too much computing power Incorrect |  |
|  | c. Error correction adds bits to the data and slows the transmission Incorrect |  |
|  | d. There are too few errors on the Internet to correct them. Incorrect |  |

Error correction sounds good but has one major drawback. It is not perfect. If an error is detected and corrected it may not be fully corrected. (For example, the Hamming Distance system is just a reasonable guess). It would change the destination address of a packet and send it off to the wrong system. Error correction is used in communication systems such as cell phones where the error rate is high enough and it is difficult to retransmit data.

Incorrect

Marks for this submission: 0/1.

Question9

Marks: 1

What parity bit is needed to 01100001 to make it even parity?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 0 Incorrect |  |
|  | b. 1 Correct |  |
|  | c. 00 Incorrect |  |
|  | d. 11 Incorrect |  |

Since there are 3 1 bits in 0110001 you have to add one more 1 bit to make the number of 1's even (4).

Incorrect

Marks for this submission: 0/1.

Question10

Marks: 1

The Cycylic Redundancy Check (CRC) will detect all possible bit errors in a packet.

Answer:

True IncorrectFalse Correct

Even though it is highly unlikely, the CRC can be fooled.

Correct

Marks for this submission: 1/1.

Quiz 9:

1

Marks: 1

Match the hardware to its type

|  |  |  |
| --- | --- | --- |
| External Modem |  | Correct |
| Dumb Terminal |  | Correct |
| Modern Laptop |  | Incorrect |

Partially correct

Marks for this submission: 0.67/1.

Question2

Marks: 1

Match the type of communication to its type.

|  |  |  |
| --- | --- | --- |
| Radio |  | Correct |
| Phone |  | Incorrect |
| One Lane Bridge |  | Incorrect |

Partially correct

Marks for this submission: 0.33/1.

Question3

Marks: 1

If a byte is sent big-endian bit order how would you transmit the number 1? Show the bit order where you start with the left bit.

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 00000001 Correct |  |
|  | b. 11111111 Incorrect |  |
|  | c. 00010000 Incorrect |  |

Byte big endian means you send the MSbit first (I object to MSB and LSB as they are confusing). So you start with the most significant bit (2^7 and send them in order down to 2^0 = 1). So the transmission would be 00000001.

Correct

Marks for this submission: 1/1.

Question4

Marks: 1

What data transfer speeds were available with the original IEEE 1394 (Firewire)

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 400 and 800 Mb/sec Incorrect |  |
|  | b. 400 Mb/sec Incorrect |  |
|  | c. 100, 200, 400 Mb/sec Correct |  |
|  | d. 1000 Mb/sec Incorrect |  |

The original Apple Firewire spec was multi speed at 100, 200 and 400 Megabit/sec. Can you count all the innovations in computing introduced by Microsoft? It is very ease. ZERO!

Correct

Marks for this submission: 1/1.

Question5

Marks: 1

Data transmission overhead is bits that are sent to synchronize sender and receiver but contain no information (other than "here comes data" and "that's the end of the data"). Overhead is wasted time on the network. What fraction of the RS-232 serial transmission is overhead?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. RS-232 is all data, no overhead Incorrect |  |
|  | b. Approximately 2 % overhead Incorrect |  |
|  | c. Approximately 10% overhead Incorrect |  |
|  | d. Approximately 20 % Correct |  |

Since there are 8 bits of data 1 start bit and 1 stop bit, RS-232 is 20% overhead. The book says 25% but that is comparing synchronous and asynchronous transmission. However, there is no single synchronous mode to compare RS-232 to so I have no idea what the statement in blue on page 159 means.

Correct

Marks for this submission: 1/1.

Question6

Marks: 1

New disk drives use SATA interfaces. What does that mean?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Simplified ATA bus Incorrect |  |
|  | b. Super ATA Bus Incorrect |  |
|  | c. Synchronized ATA Bus Incorrect |  |
|  | d. Serial ATA Bus Correct |  |

SATA uses serial transmission to and from the disk controller in the computer. Again the simplified connectors and wiring for serial data means the disk can be made cheaper than the multipinned ATA/IDE interfaces of yesteryear.

Correct

Marks for this submission: 1/1.

Question7

Marks: 1

How do we know when a synchronous frame of bits is arriving?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. They arrive continuously so we just expect them all the time. Incorrect |  |
|  | b. Synchronous frames start with a special bit Incorrect |  |
|  | c. Synchronous frames start with a special bit pattern that never appears in the data. Correct |  |
|  | d. Synchronous frames are numbered and we just wait for the next number Incorrect |  |

Synchronous systems (like ethernet) send a special bit pattern 01111110 as the flag to say "here comes data". A bit stuffing system prevents that many 1's ever appearing in the data. Once a receiving system sees the 01111110 it waits for a pattern that is not 01111110 and knows that is the first byte of the data in the frame.

Incorrect

Marks for this submission: 0/1.

Question8

Marks: 1

What is the advantage of parallel communication?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Allows many different kinds of data over the same wires Incorrect |  |
|  | b. Data can be moved faster as all 8 bits of a byte are send simultaneously Correct |  |
|  | c. Fewer errors are sent if more wires move data Incorrect |  |
|  | d. Data is moved internally in parallel so the data transmission is similar to internal CPU data movement Partially correct |  |

Parallel communication moves 8 bits at a time where serial communication moves 1 bit at a time. That would be faster if the bit transfer rate was the same.It also mimics the data movement in the CPU but that is only a marginal advantage. In theory, parallel communication would be faster.

Correct

Marks for this submission: 1/1.

Question9

Marks: 1

If parallel is so fast, why is all peripheral communication (mouse, keyboard, disks, ...) serial with USB or Firewire?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Parallel is expensive because of all the wires and connectors Correct |  |
|  | b. Parallel communication introduces error in the data transmission Incorrect |  |
|  | c. Parallel communication techniques are all patented and not freely available. Incorrect |  |
|  | d. Serial is faster. Incorrect |  |

Serial data systems (USB and Firewire) are very simple and inexpensive to implement. They use simple connectors and very few wires. Since cheaper always wins in technologies, the vendors all shifted to serial systems.

Correct

Marks for this submission: 1/1.

Question10

Marks: 1

Wireless communication is serial.

Answer:

True CorrectFalse Incorrect

Wireless communication is serial in that one bit at a time is sent. This means that most of the systems outside the CPU/Memory system are serial and look the same to all of the operating system's device drivers. Simple is good.

Correct

Marks for this submission: 1/1.

Quiz 10:

1

Marks: 1

Most computers include an internal 56K modem. What is the effective bit per second rate of the modem?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 56,000 bits of data/second Correct |  |
|  | b. 5.6 KiloBytes of data/second Correct |  |
|  | c. 56 KiloBytes of data/second Incorrect |  |
|  | d. 56,000 Bytes of data/second Incorrect |  |

Because of the start and stop bits for typical 8 bit data the effective rate of download for a V.92 56K modem is about 5.6 KiloBytes/second.

Incorrect

Marks for this submission: 0/1.

Question2

Marks: 1

AM radio is still around. Why was AM chosen as the first modulation system for radio?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. AM signals are easy to generate and easy to demodulate, allowing for simple radio transmitters and receivers. Correct |  |
|  | b. AM signals travel farther Incorrect |  |
|  | c. AM signals allow for smaller antennas and radio receivers Incorrect |  |
|  | d. AM signals provide better reception of marginal signals Incorrect |  |

In order to have the widest audience, the AM modulation system was first used as the simplest to generate and simplest to demodulate. You have seen the simple crystal radios that can hear AM signals and these have been around for 100 years. FM is far more difficult to modulate and demodulate because of the stability needed in the transmitter and receiver to stay on frequency. The modulation system has little to do with how far the signal will propagate-- the frequency of the carrier decides that.

Correct

Marks for this submission: 1/1.

Question3

Marks: 1

Why do communication systems use a carrier signal when there is no information on the carrier?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Carriers allow for wider bandwidth and greater bits/second Incorrect |  |
|  | b. Carriers allow the signal to propagate farther Partially correct |  |
|  | c. Raw bits (that is on/off) cannot be sent over any media Incorrect |  |
|  | d. Carriers usually allow the signal to propagate over the air or wire the appropriate distance Correct |  |

The 0/1 of the data can be transmitted over a copper wire or optical fiber but not over the air as a radio signal. In addition, if we want many signals over a single wire, we can put multiple carriers on the wire/optical fiber. The carrier is chosen to propagate the appropriate distance: UHF carriers are line of sight and will be available locally, HF carriers can circle the earth, audio carriers will be forwarded by the phone system.

Partially correct

Marks for this submission: 0.5/1.

Question4

Marks: 1

What modulation scheme is used for U.S. on the air Digital TV?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. AM Incorrect |  |
|  | b. COFDM Incorrect |  |
|  | c. 8VSB Correct |  |
|  | d. FM Incorrect |  |

Digital TV signals send digital MPEG-2 signals out to the users. MPEG-2 creates a highly compressed stream of 0's and 1's representing the video and audio. A forward error correction scheme is added to the bit stream. The stream of 0's and 1's is applied to an 8 level modulator so that each change in modulation provides 8 bits (256 combinations) of data. The 8 level modulation is called 8 VSB because of the vestigial sidebands (only half of the sidebands are transmitted) which saves transmitter power and makes the footprint of the station larger.

Correct

Marks for this submission: 1/1.

Question5

Marks: 1

What modulation scheme is used for wired 100 Mbps ethernet?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Phase shift Incorrect |  |
|  | b. Frequency Shift Incorrect |  |
|  | c. QAM Incorrect |  |
|  | d. None -- it is sent baseband and 0 and 1 voltages. Correct |  |

Wired ethernet need not use a carrier since the wire will propagate the signal over many 100's of meters without it. The voltages are just put on the wire as -3 volts for logical 0 and +3 volts for logical 1. It is a bit more complex than that but it is called "baseband" because there is no carrier and you see the signal directly on the wire.

Correct

Marks for this submission: 1/1.

Question6

Marks: 1

QAM and such are very fancy modulation schemes used for phone modems. Why do we have to go to the trouble of modulating phase and amplitude for phone modems? Why not just run a higher carrier frequency and modulate at higher bit rates?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. The entire signal must fit within the voice bandwidth of the phone system. Correct |  |
|  | b. The phone system will not allow bit rates higher than 56,000 bits/second Incorrect |  |
|  | c. The phone system cannot accept digital 0's and 1's in any form, it is an analog system. Incorrect |  |
|  | d. QAM can violate Shannon's theorem and send more bits down a communication channel than theoretically allowed. Incorrect |  |

The phone system only allows signals from 300 to 3300 Hz. The carrier of the QAM and all of its sidebands due to modulation must fit within this band. Typically modern modems use a carrier in the 1200 to 1600 hz range and modulate with complex constellations like that in figure 10.13 to keep their signal within the allowed voice bandwidth.

Correct

Marks for this submission: 1/1.

Question7

Marks: 1

If you use a modem on a noisy phone line, how would the effective data rate change?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Decrease as the modem would slow down to a lower rate protocol Correct |  |
|  | b. Stay the same as the modem would just increase its signal power to keep signal/noise ratio the same. Incorrect |  |
|  | c. Decrease due to the narrower bandwidth the phone company provides once the signal becomes noisy. Incorrect |  |
|  | d. Stay the same as noise does not affect communication channels until it gets greater than the signal Incorrect |  |

Again here is Shannon' s Theorem raising its ugly head. If noise increases, the S/N drops and the effective bit rate of the channel (which is fixed in bandwidth and power by the phone company) decreases. Modern modems automatically drop down to lower bit rate protocols once they cannot communicate at the high rates. The funny noise when a modem makes an initial contact is the modem testing the line to see what frequencies make it through with what signal to noise. From that information, the modem determines the best data rate to use.

Incorrect

Marks for this submission: 0/1.

Question8

Marks: 1

The phase of a sinusoidal signal:

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Runs from 0 to 360 degrees each cycle Partially correct |  |
|  | b. Can also be expressed as -180 to + 180 degrees Partially correct |  |
|  | c. Can be used to encode 0/1 data by shifting the phase in a known fashion Partially correct |  |
|  | d. All of the above Correct |  |

All of these are true: phase can be 0 to 360 or - 180 to + 180 and usually are relative to some other signal or some fixed point on the cycle (perhaps the zero crossing). My shifting the phase of a modulated signal we can encode 0's and 1's into a carrier.

Correct

Marks for this submission: 1/1.

Question9

Marks: 1

If two sine waves are "out of phase" one is going up while the other is going down. If we take the difference in voltage between two "out of phase" signals we get a large sine wave at the carrier frequency. What do we get if we measure the difference in voltage between two signals that are "in phase"?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. A larger sine wave at the carrier frequency Incorrect |  |
|  | b. A sine wave of 1/2 the incoming amplitude at the carrier frequency Incorrect |  |
|  | c. A sine wave of 1/3 the incoming amplitude at the carrier frequency Incorrect |  |
|  | d. Zero Correct |  |

Since the two sine waves are identical and "in phase" (that is both are going up at the same time). The have identical voltages. Since they are identical if we take the difference between two identical numbers we get ZERO. That is the magic of phase modulation, start the local oscillator at the carrier frequency and take the difference between the incoming and local signal. ZERO indicates in phase and maybe the binary 0 and a large sine wave (whose amplitude we really don't care about) indicates 1. Rectify the large sine wave and we have a large voltage for 1 and no voltage for 0.

Correct

Marks for this submission: 1/1.

Question10

Marks: 1

Cell phones us a CDMA spread spectrum modulation scheme. What is spread spectrum?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Radio signals are modulated with wide side bands to cover many Mhz of frequency Partially correct |  |
|  | b. Signals hop from frequency to frequency with a little data sent at each time. Since different transmitters hop to different frequencies, they don't interfere with each others' transmissions. Correct |  |
|  | c. Uses VHF, UHF and SHF frequencies Incorrect |  |
|  | d. Transmit in both the 2.4 and 5.6 Ghz bands Incorrect |  |

Spread spectrum signals hop from frequency to frequency in synchronization so that only receivers who know the hopping sequence will effectively receive the signal. All other receivers will just hear a background noise. This allows many systems to use the same frequency band simultaneously without interference.

Partially correct

Marks for this submission: 0.5/1.

Quiz 11:

1

Marks: 1

Match the activity with the type of multiplexing

|  |  |  |
| --- | --- | --- |
| Interstate 35W entrance ramp |  | Correct |
| AM Radio |  | Correct |
| FM Radio |  | Correct |
| Air Raid Siren |  | Incorrect |
| 4 way stop sign |  | Correct |

Partially correct

Marks for this submission: 0.8/1.

Question2

Marks: 1

How do local cell phone systems multiplex here in the U. S. ?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. FDM Incorrect |  |
|  | b. TDM Incorrect |  |
|  | c. WDM Incorrect |  |
|  | d. CDM Correct |  |

All cell phones in the U.S. run on the same frequency band at the same time. Each phone uses a different chip code in the CDMA system to send their data. The receiver with the same chip code is the only one that will be able to decode the signal from the individual cell phone. This allows many users to share the same bandwidth and cell tower.

Correct

Marks for this submission: 1/1.

Question3

Marks: 1

What is the channel spacing for the U.S. AM radio band?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 1 Mhz Incorrect |  |
|  | b. 100 khz Incorrect |  |
|  | c. 10 khz Correct |  |
|  | d. 1 khz Incorrect |  |

AM radio stations are centered every 10 khz on the band from 520 khz to 1710 khz. The 10 khz spacing allows radios to be channelized and move easily from frequency to frequency.

Correct

Marks for this submission: 1/1.

Question4

Marks: 1

The chief advantage of Code Division Multiplexing is?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Many data streams can be sent over the same medium Partially correct |  |
|  | b. Adding additional data streams does not affect the existing data stream -- that is, CDMA is expandable Correct |  |
|  | c. CDMA uses the minimum bandwidth of all multiplexing modes Incorrect |  |
|  | d. CDMA is easier to spell than frequency division multiplexing Incorrect |  |

Any one data stream in CDMA knows nothing about the other streams. CDMA is easily expandable and no one needs wait for the other senders to finish their turn as in TDM. CDMA requires a reasonably large bandwidth; but, that bandwidth can be shared by many users.

Correct

Marks for this submission: 1/1.

Question5

Marks: 1

Looking down the fiber optic cable of Dense Wavelength Division Multiplexed system, what would you see?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Nothing, the wavelengths are out of the visible range Correct |  |
|  | b. A rainbow of colors Incorrect |  |
|  | c. white light Incorrect |  |
|  | d. changing colors across the spectrum of the rainbow Incorrect |  |

Again most of the light used in fiber optic systems is in the infrared wavelengths and looking down the fiber you wouldn't see anything. The light is not in the visible range.

Incorrect

Marks for this submission: 0/1.

Question6

Marks: 1

The purpose of the guard band in FDM is?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Entertain the users between packets. Incorrect |  |
|  | b. Prevent interference between adjacent channels Correct |  |
|  | c. Allow users to find the appropriate signal Incorrect |  |
|  | d. Prevent transmitters from hearing other signals Incorrect |  |

Most FDM signals have wide bandwidths such that if the receiver is only slightly off frequency, it will hear adjacent signals up or down the spectrum. To keep receivers from becoming confused a small empty guard band is inserted between signals.

Incorrect

Marks for this submission: 0/1.

Question7

Marks: 1

Our ethernet has a bandwidth of approximately 100 Mhz. How many voice channels could be send down this wire using hierarchical FDM, approximately?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 3,600 Incorrect |  |
|  | b. 7,000 Incorrect |  |
|  | c. 10,000 Incorrect |  |
|  | d. 25,000 Correct |  |

In Hierarchical FDM each voice channel is allocated 4 khz of bandwidth. Dividing 100 Mhz by 4 khz we get 25,000 voice channels on one ethernet cable . Not bad!

Correct

Marks for this submission: 1/1.

Question8

Marks: 1

Which two types of multiplexing are identical? (except the book makes them sound different)

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Code and Frequency Incorrect |  |
|  | b. Frequency and Phase Incorrect |  |
|  | c. Phase and Time Incorrect |  |
|  | d. Frequency and Wavelength Correct |  |

Frequency is inversely proportional to wavelength. Frequency goes up and wavelength goes down. Frequency and wavelength multiplexing are exactly the same thing.

Correct

Marks for this submission: 1/1.

Question9

Marks: 1

Synchronous TDM means?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. The receiver is synchronized to the transmitter Partially correct |  |
|  | b. Only large data blocks can be sent Incorrect |  |
|  | c. Data from the senders follow in a fixed round-robin fashion Correct |  |
|  | d. Only a small number of sending stations are allowed on the medium Incorrect |  |

Synchronous systems means the senders' data follow in a round-robin fashion (ABCDABCDABCD). The sender and receiver have to be synchronized, but that is true for any communication system if the receiver is to recognize what is sent. Any number of stations can be part of the synchronized stream, but the number of stations is fixed as the receiver expects a specific unchanging sequence.

Correct

Marks for this submission: 1/1.

Question10

Marks: 1

Why do we multiplex many users on the same medium?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Distribute the cost of an expensive medium among many users Correct |  |
|  | b. Allow for faster access for many users Incorrect |  |
|  | c. Make use of more bandwidth Incorrect |  |
|  | d. Coordinate many users on the same medium Incorrect |  |

Long distance data links (phone or digital) are very expensive. If we share a single data link among many users that distributes the cost over all these users and makes it more affordable to each user.

Correct

Marks for this submission: 1/1

Quiz 12:

1

Marks: 1

A ADSL modem is adaptive. What does that mean?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. ADSL adapts to the kind of data sent Incorrect |  |
|  | b. ADSL adapts to the type of client/server interaction sent Incorrect |  |
|  | c. ADSL adapts to the congestion on the Internet Incorrect |  |
|  | d. ADSL adapts to the noise, bandwidth and fidelity of the local loop Correct |  |

A pair of ADSL modems test the local loop as they make initial connection. They adapt to the bandwidth, noise and fidelity of the wire to use the maximum data rate given the conditions. If the noise is high (remember Shannon's theorem) the modems slow down.

Correct

Marks for this submission: 1/1.

Question2

Marks: 1

Comer goes to great length to tell about splitters in ADSL installations. Why don't you need a splitter on a signal shown in Figure 12. 5?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Signals above 4 khz will be attenuated by the phone Partially correct |  |
|  | b. You cannot hear signals above 22 khz where the upstream signal starts Partially correct |  |
|  | c. Signals above 22 khz don't propagate down house wiring Incorrect |  |
|  | d. Both 1 and 2 above Correct |  |

ADSL was designed to use frequencies well above the ear's sensitivity for digital signals. In addition, filters in the phone itself don't pass frequencies above about 7 khz to keep out noise from lightning and other static causing devices. We really don't need splitters, except if you buy really cheap phones.

Correct

Marks for this submission: 1/1.

Question3

Marks: 1

The chief disadvantage of a cable modem system for Internet connection is.

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Cable bandwidth is shared by all they users in your neighborhood. Correct |  |
|  | b. Cable modems tend to have slower data rates than ADSL Incorrect |  |
|  | c. Like the TV transmissions on cable, the cable modem is only one way. Incorrect |  |
|  | d. Cable modems are more prone to static interference than ADSL since the coaxial cable is better shielded. Incorrect |  |

Usually the cable bandwidth to a neighborhood is shared by all the users in that neighborhood. If there are N users on then you only get 1/Nth of the bandwidth. At busy times, everyone slows down.

Correct

Marks for this submission: 1/1.

Question4

Marks: 1

Why not install fiber to everyone's house and bring everyone's bandwidth up to nearly infinity?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Fiber cannot be connected directly to computers Incorrect |  |
|  | b. Fibers cannot be strung overhead were most of the phone wires still enter your house. Incorrect |  |
|  | c. Fiber cables and connectors are still much too expensive to install and then try to charge a reasonable amount to the subscriber Correct |  |
|  | d. Fiber transmissions are too fast and would swamp most home computers Incorrect |  |

The only thing holding back fiber to the home is the cost. Since cable TV and phone wires are already strung to the houses, it is difficult to provide a reasonably priced alternative if you have to pay the cost of stringing up another fiber cable to every house. Fiber cable is about 10 times more expensive than copper twisted pair and the fiber connectors about 100 times more expensive than copper RJ-45 jacks.

Correct

Marks for this submission: 1/1.

Question5

Marks: 1

What services was ISDN designed for?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Two digital voice and one control circuit Correct |  |
|  | b. One digital voice, one slow speed video and one control circuit Correct |  |
|  | c. Two video and one voice circuits Incorrect |  |
|  | d. Two data and one control circuits Incorrect |  |

ISDN was designed to provide 2 separate digital voice circuits and one slow speed control circuit to the home/office. The two voice circuits could be combined to provide one 128Kbps circuit for compressed audio (sometimes used for High Fidelity audio -- remove feeds for radio stations).

Correct

Marks for this submission: 1/1.

Question6

Marks: 1

What is the bit rate allocated to each voice circuit in the STS-192 transmission?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 155520 bps Incorrect |  |
|  | b. 64000 bps Correct |  |
|  | c. 56000 bps Incorrect |  |
|  | d. 4000 hz Incorrect |  |

Dividing 9,953,280 bits/second by 155,520 voice channels we get 64,000 bit/second-voice channel

Incorrect

Marks for this submission: 0/1.

Question7

Marks: 1

The phone company provides a digital signal to users made of voltages representing 1's and 0's. Why does the CSU prevent too many consecutive 1 bits on the cable?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Too difficult to stay synchronized with no voltage transistions Partially correct |  |
|  | b. 1's contain no information until they are paired with 0's Incorrect |  |
|  | c. 1's are too long to transmit contuously Incorrect |  |
|  | d. Continuous 1's would put a net DC current on the wire and cause charge to build up at the receiving end. Correct |  |

The book claims that too many 1's would cause a net current (charge buildup) at the receiving end. This is true, but also if there are too many 1's or 0's in a row the receiving system would lose synchronization and not be able to count the number of bits passing by. To prevent this, a balanced sequence of 1's and 0's is sent even if there is a continuous string of the same bit. The CSU device on the far end removes the artificially stuffed bits and the receiving computer never knows the difference.

Correct

Marks for this submission: 1/1.

Question8

Marks: 1

"A typical residential subscriber receives more data from the Internet than they send." When might this NOT be the case?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. When the subscriber is on-line 24/7. Incorrect |  |
|  | b. When the subscriber operates a web server Correct |  |
|  | c. When the subscriber uses wireless networking Incorrect |  |
|  | d. When the subscriber sends only short messages such as tweets. Incorrect |  |

If the subscriber operates a web server, it may be sending out many more bytes than receiving. Individual subscribers can operate their own web server from home (though rarely done). This means the short GET requests come in and the multi kilobyte web images go out.

Correct

Marks for this submission: 1/1.

Question9

Marks: 1

Many home users have wireless access to the internet. Why is this catching on?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Requires no change of wiring to the house Partially correct |  |
|  | b. Can be used anywhere the provider supplies access points Partially correct |  |
|  | c. Makes use of wireless technology build into most new computer Partially correct |  |
|  | d. All of the above Correct |  |

Because most computers come out of the box with wireless modems, they can be used immediately in metropolitan wireless networks. Wireless systems require no changed in house wiring and can be used anywhere the provider puts up an antenna.

Correct

Marks for this submission: 1/1.

Question10

Marks: 1

Since phone service is universal, ADSL is available everywhere in the U.S.

Answer:

True IncorrectFalse Correct

There are just some rural users whose phone lines are so long that the ADSL high frequencies do not survive the travel. For them, satellite Internet may be the only choice.

Correct

Marks for this submission: 1/1.

Quiz 13:

1

Marks: 1

Match the LAN topology to its characteristics

|  |  |  |
| --- | --- | --- |
| All stations hear all transmissions |  | Correct |
| Packets are regenerated at each station |  | Correct |
| Requires the most length of wire for a given number of stations |  | Correct |
| Only on computer can talk at a time |  | Correct |
| Signals from any host computer can go directly to any other host computer |  | Correct |
| Has a single point of failure. If that single item fails all stations are out of contact. |  | Correct |

Correct

Marks for this submission: 1/1.

Question2

Marks: 1

Why is it necessary to byte stuff (that is add extra escape bytes) in some packet protocols?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. To prevent control characters within the data being interpreted as the beginning or end of packets Correct |  |
|  | b. To make the packets longer Incorrect |  |
|  | c. So that the receiving station is aware of special data Incorrect |  |
|  | d. To make the packet error free Incorrect |  |

Since certain bytes in these protocols have special meaning (SOH, EOT, ESC), if these byte appear in the data (they may be part of a binary message) they cannot be interpreted as the start-of-header, for example. To prevent that, if any of those special characters appear in the data they are removed and an ESC X message (of two bytes) is put in their place. The receiving station is sensitive to the ESC character and removes all of them and the following character and puts the original byte back in the message.

Correct

Marks for this submission: 1/1.

Question3

Marks: 1

A packet which experiences byte stuffing could?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Easily be lost due to so many ESC characters Incorrect |  |
|  | b. Be shorter than the original packet Incorrect |  |
|  | c. Never be lost in the network Incorrect |  |
|  | d. Be up to twice as long as the original packet Correct |  |

Since Byte Stuffing replaces one byte with two, the resulting "stuffed" packet could be up to twice as long as the original packet. This makes it difficult to send stuffed packets thru a system with fixed size packets.

Correct

Marks for this submission: 1/1.

Question4

Marks: 1

Circuit switching makes use of what type of multiplexing to appear that individual circuits are created between end points?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Frequency Division Multiplexing Partially correct |  |
|  | b. Time Divisoin Multiplexing Partially correct |  |
|  | c. Synchronized Time Division Multiplexing Partially correct |  |
|  | d. All of the above Correct |  |

Circuit switching creates a route from sender to receiver. This appears to be a circuit that no one else is using. However, since most media can handle many more transmissions than just yours, all modes of multiplexing are used to share the media between source and destination.

Correct

Marks for this submission: 1/1.

Question5

Marks: 1

Ethernet uses a 48 bit address to identify each ethernet device. How many different ethernet addresses are there?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 48 Incorrect |  |
|  | b. 10 to the 48th power -- 1 with 48 zeroes behind it Incorrect |  |
|  | c. 2 to the 48th power -- approximately 300 Trillion Correct |  |
|  | d. 480,000,000,000 Incorrect |  |

With 48 bits of addressing in the ethernet address, there are 2 to the 48th power unique addresses. That is approximately 300 trillion addresses or 50,000 addresses for each man, woman and child on the face of the planet.

Correct

Marks for this submission: 1/1.

Question6

Marks: 1

Occasionally ethernet needs to broadcast a packet out to everyone on the Local Area Network. What destination address is used for an ethernet broadcast?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Any address with 1 in the 8th bit location Incorrect |  |
|  | b. An address of 48 1's Correct |  |
|  | c. An address of 48 0's Incorrect |  |
|  | d. An address that contains the network number in the top 8 bits Incorrect |  |

Ethernet broadcasts are addressed with all 1's in the destination address. All ethernet cards listen for their unique address and the broadcast address.

Correct

Marks for this submission: 1/1.

Question7

Marks: 1

In general, what parts of the Internet and Networking are set by the IEEE?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Applications -- such as e-mail and web browsers Incorrect |  |
|  | b. Internet Layer -- such as addresses and packet contents Incorrect |  |
|  | c. Transport layer -- such as timing and rebroadcasting Incorrect |  |
|  | d. Physical and Data Link layers -- such as ethernet and fiber optics Correct |  |

The IEEE is an electrical engineering standards organization so they set the physical standards such as electrical signals, medium access (who talks next) and ethernet addresses (the Logical Link Control).

Correct

Marks for this submission: 1/1.

Question8

Marks: 1

Which of the topologies appears to allow the highest rate of data transmission between all computers?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Bus -- they all hear the same signa Incorrect |  |
|  | b. Star -- each leg of the star handles one computer Incorrect |  |
|  | c. Ring -- many packets can be circulating around the ring Incorrect |  |
|  | d. Mesh -- each computer can be simultaneously talking to all other computers Correct |  |

The mesh topology would provide the maximum data transmission to all other computers as there is a unique wire for every pairing of computers. The disadvantages of the mesh: high wire cost, many connections, many transmissions to manage make it less than desireable. Mesh topologies are only used in the most critical of systems (such as airplane controls) where any computer can take over from any other computer and the multiplicity of connections keeps data flowing.

Correct

Marks for this submission: 1/1.

Question9

Marks: 1

Multicast packets are destined for?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. One user in a group of computers Incorrect |  |
|  | b. All users in a group of computers Correct |  |
|  | c. Computers that require packets to take multiple hops Incorrect |  |
|  | d. Computers whose address is a multple of the sending computer's address Incorrect |  |

Multicasting is sending packets to a specified group. In both ethernet and Internet addresses there are reserved addresses for multicast groups. All computers in that group are expected to receive and process the multicast packets to their group. (This is hardly ever used in ethernet; I will explain why later.)

Incorrect

Marks for this submission: 0/1.

Question10

Marks: 1

Packet switching uses multiplexing as well. However, what is the difference between data blocks used in packets and the data blocks used in circuit switching?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Circuit switching blocks are larger than packets Incorrect |  |
|  | b. Circuit switching blocks must be all the same size where packets can vary in size. Incorrect |  |
|  | c. Packets must contain headers with destination addresses as they pass thru the network Correct |  |
|  | d. Packet switching takes less network power to forward the blocks Incorrect |  |

Since all blocks of data in circuit switching pass thru the same circuit, they need not contain a header in the block with destination and source addresses. Packets much have these addresses so that each forwarding node along the way can read the header and determine the next hop in the route.

Incorrect

Marks for this submission: 0/1.

Quiz 14:

1

Marks: 1

Match these access protocols with a particular technology

|  |  |  |
| --- | --- | --- |
| Channelization Protocol |  | Correct |
| Random Access Protocol |  | Correct |
| Controlled Access Protocol |  | Incorrect |
| Controlled Access Protocol |  | Incorrect |

Partially correct

Marks for this submission: 0.5/1.

Question2

Marks: 1

In the ALOHA protocol how does the sending station get acknowledgement that the packet it sent has been received correctly?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. The receiving station sends an ACK packet back Incorrect |  |
|  | b. The receiving station repeats back the packet on the outbound channel Correct |  |
|  | c. The receiving station sets the ACK bit on in its next transmission Incorrect |  |
|  | d. No acknowlegement is used in ALOHA. All packets are assumed properly received. Incorrect |  |

A packet in ALOHA is repeated by the central station back to all the stations of the net. The sending station can then check this repeated packet against the packet it sent to verify that the packet was properly received.

Correct

Marks for this submission: 1/1.

Question3

Marks: 1

When does CSMA/CD exhibit binary backoff?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. When too many errors have been received by the remote station Incorrect |  |
|  | b. When packets are arriving too quickly Incorrect |  |
|  | c. When only binary signals are sent. Incorrect |  |
|  | d. When a station experiences a packet collision Correct |  |

Whe two or more stations talk at the same time, a collision occurs. To prevent the stations from colliding again, they must wait a random amount of time before retransmitting. That random time is doubled after each successive collision, stretching out the time over which many stations will transmit. This lowers the probability of further collisions.

Correct

Marks for this submission: 1/1.

Question4

Marks: 1

How do wireless LAN's avoid collisions?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Allow transmissions only at speccified times Incorrect |  |
|  | b. Require transmitting stations to get a Clear to Send message from the receiving station before sending Correct |  |
|  | c. Never transmit while other stations are transmitting Incorrect |  |
|  | d. Assign time slots for each station to transmit. Incorrect |  |

Before a wireless transmission is made, the sending station sends out a Request to Send packet to the receiving station. If no other conversation is iminent, the receiving station sends out a Clear to Send packet that everyone hears. This tells other stations (not involved in this conversation) that two stations are communicating so don't interrupt.

Correct

Marks for this submission: 1/1.

Question5

Marks: 1

Polling means?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Each computer polls all the other computers to see if they have packets ready. Incorrect |  |
|  | b. Each computer maintains a poll of packets ready for transmission and sends one when the network is available.Incorrect |  |
|  | c. A central computer maintains a list of packets and sends them out to the receiving stations when ready. Incorrect |  |
|  | d. A central computer queries each computer in order giving it permssion to send packets if they are ready. Correct |  |

Polling requires a central computer to ask each computer on the network, in order, if it has packets ready. This is a very fair and balanced system, but requires a single centralized control computer that is a single point of failure.

Correct

Marks for this submission: 1/1.

Question6

Marks: 1

What access control is used for satellite packet two way communication and why?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Random Access to allow all ground users equal access to the satellite. Incorrect |  |
|  | b. Reservation Access so that each user takes turns. The long distance to the satellite introduces a singificant delay that makes collisions difficult to detect and control . Correct |  |
|  | c. Time Divsion Multiplexing to give each station their designated time slot to transmit Incorrect |  |
|  | d. Token passing to allow each station with a token to transmit only for a short burst. Incorrect |  |

Because of the great distances from the ground to the satellite, there is a significant time delay for the packet's round trip transmission time. This makes collisions difficult and wasteful to control. Therefore, satellites ususally use a reservation system for packet transmissions. The ground station asks for time and the satellite designates a time slot for the ground station to use.

Correct

Marks for this submission: 1/1.

Question7

Marks: 1

What if a station receives the token, but has not message to send?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. It lets the token expire and disappear. Incorrect |  |
|  | b. it passes the token to the next station Correct |  |
|  | c. It holds on to the token until it has something to say. Incorrect |  |
|  | d. It sends the token back to the station that sent it. Incorrect |  |

Tokens circulate regardless of whether stations have anything to transmit. If a station receives the token and has no packets ready, it just forwards the token on to the next station in order.

Correct

Marks for this submission: 1/1.

Question8

Marks: 1

Why do wireless systems have to have special collision avoidance that wired systems don't need?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. In wireless systems, some stations cannot hear other stations and would be unaware of on going conversationsCorrect |  |
|  | b. Wired systems packets travel faster than wireless systems. Incorrect |  |
|  | c. Wireless bitrates are slower than wired bit rates. Incorrect |  |
|  | d. Wireless packets are longer than wired packets. Incorrect |  |

In a wired system, we assume that all stations can hear all other stations. If a collision occurs anywhere in the LAN, all stations will hear it. In wireless systems, stations may not hear all the other stations in a network due to distance, interference or such. Thus stations may interrupt an on going conversation that is too weak for them to hear (usually they can hear one side but not the other. ). With RTS and CTS all stations in the vicinity of the conversation will know that two stations are conversing and not interrupt until they are done.

Correct

Marks for this submission: 1/1.

Question9

Marks: 1

Why have we chosen to use Random Access Protocols for our networking?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Random Access is more reliable than other systems Partially correct |  |
|  | b. Other systems lead to much slower networks than Random Access Incorrect |  |
|  | c. Random is far simpler to implement on a network than other systems. Incorrect |  |
|  | d. Random Access Protocols mean that no one computer is in charge of the network and there is no single point of failure. Correct |  |

We want a network that runs without any central control. If there was a central reservation/control system that system would be a single point of failure and make the network far less reliable. Every computer on the network runs the exact same protocol and runs independent of all the other systems on the network. This make Random Access Protools very robust and reliable.

Correct

Marks for this submission: 1/1.

Question10

Marks: 1

Use of a Token Passing access conrtol requires that the network use a Ring Topology to pass the Token from station to station.

Answer:

True IncorrectFalse Correct

Any topology can use a "logical token" to give access to the network. The token is used by one station and then passed on thru the network to another station. Sometimes this is called a logical ring.

Correct

Marks for this submission: 1/1.

Quiz 15:

1

Marks: 1

Another name for a crossed ethernet cable is?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Intercomputer cable Incorrect |  |
|  | b. Straight Cable Incorrect |  |
|  | c. Optional cable Incorrect |  |
|  | d. Null Modem Cable Correct |  |

Because modems and terminals have a different pin-out, one must use a crossed cable to connect two terminals. So the crossed ethernet cable is often called a "null modem" cable.

Correct

Marks for this submission: 1/1.

Question2

Marks: 1

For the largest possible frame, approximately what fraction of the ethernet frame is overhead?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 1 % Correct |  |
|  | b. 2 % Incorrect |  |
|  | c. 10 % Incorrect |  |
|  | d. 15 % Incorrect |  |

Total frame length is 1518 octets (8 bit bytes) and the total overhead is 18 of those bytes. 18/1518 = 0.011 or 1 %

Correct

Marks for this submission: 1/1.

Question3

Marks: 1

We discover an ethernet with a frame type of 9001. What is that frame for?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Normal Internet Protocol Frame Incorrect |  |
|  | b. X.25 packet Incorrect |  |
|  | c. TCP/IP Compression system Incorrect |  |
|  | d. 3 Com Bridge Correct |  |

By checking with the ethernet frame types in the appropriate RFC you will find that ethernet fram e type 9001 is reserved for 3 Com bridges.

Correct

Marks for this submission: 1/1.

Question4

Marks: 1

The ethernet hub connected with twisted pair to each computer has the following advantage(s).

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Wiring is less expensive than coaxial cable Partially correct |  |
|  | b. Each link to the hub has only on station on each end and thus no probability of collisions Partially correct |  |
|  | c. Many stations can communicate simultaneously on independent links Partially correct |  |
|  | d. All of the above Correct |  |

All are true

Correct

Marks for this submission: 1/1.

Question5

Marks: 1

The hub system's main disadvantage(s) may be?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Any failure in the hub disables the entire network. Correct |  |
|  | b. The wiring system is simpler Incorrect |  |
|  | c. It saves money Incorrect |  |
|  | d. Requires different access software in each computer Incorrect |  |

Any failure of the hub disables the entire network.

Correct

Marks for this submission: 1/1.

Question6

Marks: 1

The 802.3 frame has a different header. How does a receiving ethernet card recognize whether it is an original or an 802.3 frame?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 802.3 in the frame type Incorrect |  |
|  | b. FFFF in the frame type Incorrect |  |
|  | c. A number less than 1500 in the frame types Correct |  |
|  | d. A shorter frame Incorrect |  |

An 802.3 frame includes a frame length less than 1500 in the frame type field.

Correct

Marks for this submission: 1/1.

Question7

Marks: 1

Connecting a 10 Mbps ethernet card to a 100 Mbps ethernet card is?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Possible and both will communicate at 100 Mbps Incorrect |  |
|  | b. Possible and both will communicate at 10 Mbps Correct |  |
|  | c. Possible and each will communicate at their own speed Incorrect |  |
|  | d. Not possible, the cables and signals are incompatible Incorrect |  |

Ethernet cards can easilly connect regardless of speed. They will auto sense and set their speed to the lower of the two cards.

Correct

Marks for this submission: 1/1.

Question8

Marks: 1

For the smallest possible ethernet frame, what fraction of the frame is overhead?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 2 % Incorrect |  |
|  | b. 10 % Incorrect |  |
|  | c. 28 % Correct |  |
|  | d. 52 5 Incorrect |  |

The smallest frame has 46 bytes of payload and 18 bytes of header/trailer for 18/64 = 28 % overhead.

Correct

Marks for this submission: 1/1.

Question9

Marks: 1

What network topology is represented by the Thick Net shown in figure 15.4?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Bus Correct |  |
|  | b. Ring Incorrect |  |
|  | c. Star Incorrect |  |
|  | d. Linear Incorrect |  |

Thicknet is a bus topology where all computers are wired to the same bus wire throughout the LAN. When one station talks, all others will hear the transmission.

Correct

Marks for this submission: 1/1.

Question10

Marks: 1

Which of the local area network topologies requires the most wire?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Thicknet Incorrect |  |
|  | b. Twisted Pair Hub Correct |  |
|  | c. Thinnet Incorrect |  |
|  | d. Wireless ethernet Incorrect |  |

Because we must wire each station back to the hub, the twisted pair hub requires the most wire of any of the topologies. The advantage is that the twisted pair wire is very inexpensive and still cheaper in the long run than Thick/Thin net with all the tranceivers needed.

Correct

Marks for this submission: 1/1.

Quiz 16:

1

Marks: 1

When I look at a box of a network device and see 802.11x, where x is some letter, what sort of network device is that?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. A wireless receiver Incorrect |  |
|  | b. A wireless tranceiver Correct |  |
|  | c. An ethernet device compatible with unshielded twisted pair networks. Incorrect |  |
|  | d. A device that works in the U. S. and Europe. Incorrect |  |

The IEEE 802.11 standards apply to wireless networking devices that send and receive data over a radio transceiver.

Incorrect

Marks for this submission: 0/1.

Question2

Marks: 1

What is the purpose of a LAN Access Point?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Connect wireless devices to the wired LAN Correct |  |
|  | b. Connect wireless devices to other wireless devices Partially correct |  |
|  | c. Connect wired devices to other wired devices without ethernet cables Incorrect |  |
|  | d. Connect wireless devices to power sources Incorrect |  |

Most LANs have as their backbone a wired network. To give each region of the office access to that network, we can use access points which connect the wired network to the collection of wireless devices.

Correct

Marks for this submission: 1/1.

Question3

Marks: 1

When your laptop sends a request to a wireless network, how is it determined which access point receives and responds to the message?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Only that access point that is presently connected to your laptop. Correct |  |
|  | b. The access point that receives the strongest signal from your laptop Incorrect |  |
|  | c. The accesss point that receives the message with the fewest number of errors Incorrect |  |
|  | d. All access points that receive sufficient signal strength to decode the request. Incorrect |  |

Your laptop's wireless driver associates itself with one access point at any time. Usually it does this thru discovery of access points that it maintains in a list of previously connected AP's. When you laptop first discovers a familiar AP it associates itself with the AP and communicates with that one only. If signal from the AP is lost or becomes error filled, the driver will find another AP that it recognizes and makes connection. If if finds no familiar one, it tries to make connection to the strongest signal.

Incorrect

Marks for this submission: 0/1.

Question4

Marks: 1

What power level to typical bluetooth systems use?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 1 mw Correct |  |
|  | b. 10 mw Partially correct |  |
|  | c. 100 mw Partially correct |  |
|  | d. 1 db Incorrect |  |

Most bluetooth systems are typically designed for 10 m transmissions between stations and use as little power as possible. Most systems us 1 mw of power to save battery power.

Correct

Marks for this submission: 1/1.

Question5

Marks: 1

The frequencies of wireless systems are listed in Ghz. What is a Ghz?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 10 to the 15th cycles/second Incorrect |  |
|  | b. 10 to the 12th cycles/second Incorrect |  |
|  | c. 10 to the 9th cycles/second Correct |  |
|  | d. 10 to the 6th cycles/second Incorrect |  |

Giga is the terminology for a billion or 10 to the 9th power. 2.4 Ghz is 2,400,000,000 cycles/second.

Correct

Marks for this submission: 1/1.

Question6

Marks: 1

What government agency controls and licenses radio transmitting equipment in the U.S.?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. IEEE Incorrect |  |
|  | b. FTC - Federal Trade Commission Incorrect |  |
|  | c. FRA - Federal Radio Authority Incorrect |  |
|  | d. FCC - Federal Communication Commission Correct |  |

FCC controls and licenses all civilian communication transmitters in the U. S. Military communication is controlled by the National Telecommunication Authority in cooperation with the FCC.

Correct

Marks for this submission: 1/1.

Question7

Marks: 1

Radio Frequency Identification systems are mounted on or in various product. A radio receiver gets a burst of data from the RFID tag with its indentification number in the burst. Where does the RFID tag get its power to transmit its number?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Battery within the tag Incorrect |  |
|  | b. The tag must be connected to a DC power source Incorrect |  |
|  | c. The tag includes its own RF power generator Incorrect |  |
|  | d. The tag rectifies power from the RFID reader and uses that power to power its transmitter. Correct |  |

The RFID reader sends out a small RF signal that the tag rectifies and turns into power for its transmitter. The tag is powered by the reader.

Correct

Marks for this submission: 1/1.

Question8

Marks: 1

What has been the major downfall of VSAT installations for use in connecting to wide area networks?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Satellite has to be tracked and moving antennas are expensive Incorrect |  |
|  | b. Rain attenuates the signal Correct |  |
|  | c. The dish is too large for most customer's installations Incorrect |  |
|  | d. The data rate to the satellite is too slow to use the Internet Incorrect |  |

The major effect that limits VSAT usage is that the signal is attenuated by rain drops. It is quite expensive to install the system and pay for the service, but the service drops out completely during moderate rain.

Correct

Marks for this submission: 1/1.

Question9

Marks: 1

Fixed WIMAX uses what frequency ranges for its data transmissions?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 2.5 Ghz Partially correct |  |
|  | b. 3.5. Ghz Partially correct |  |
|  | c. 5.8 Ghz Partially correct |  |
|  | d. All of the above Correct |  |

WiMax uses all of the same frequency bands used for other 802.11 LAN networking.

Partially correct

Marks for this submission: 0.33/1.

Question10

Marks: 1

What access protocol is used to give wireless devices permission to send data to an access point?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Wireless reservation -- each station is given a specified time to talk Incorrect |  |
|  | b. Random access -- stations communicate at a random time Incorrect |  |
|  | c. Collision avoidance -- by sending a burst to the receiving and communicating only if given a Clear to Send Correct |  |
|  | d. No access protocol is needed as wireless devices each have their own spread spectrum code Incorrect |  |

Wireless 802.11 devices send a Request to Send burst to get permission to talk. When they receive a Clear to Send burst, everyone else is quiet while the designated station starts the communication to the receiving station.

Correct

Marks for this submission: 1/1.

Quiz 17:

1

Marks: 1

The learning bridge has just been taken out of the box and installed between two ethernet segments. Hosts X, Y and Z are on the left segment; A, B and C on the right segment. The first packet it hears is a packet from A to B on the right segment. What does the bridge do with that packet?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Sends it to the left segment, it does not know where B is Correct |  |
|  | b. Sends it to the right segment, B is there. Incorrect |  |
|  | c. Nothing, B can hear A's transmissions directly Incorrect |  |
|  | d. Sends it to both right and left segments since it does not know where B is. Incorrect |  |

A "just out of the box" bridge has nothin in its routing table. It hears a packet on the right segment destined for B and sends it to the left segment not sure where B is.

Incorrect

Marks for this submission: 0/1.

Question2

Marks: 1

To improve switching they have introduced cut-through switches. What do cut through switches do?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Send the frame to the destination based on the last frame's addresses Incorrect |  |
|  | b. Send the frame without checking the error detection at the end of each fram Incorrect |  |
|  | c. Send the frame through based on instructions from a centralized switch Incorrect |  |
|  | d. Send the frame through as soon as it learns the frame's destinatioin. Correct |  |

The Cut through switch just watches the frame's header and when it hears the destinationi, starts sending the frame to that address. It doesn't check the error check on the frame so some bogus frames may get through. However, this is not a serious problem, in that the destination station will recognize a bogus frame and throw it out. Cut through switches significantly reduce delay time of a frame in a switch by as much as 80 % and make the network appear much faster.

Correct

Marks for this submission: 1/1.

Question3

Marks: 1

Since bridges and switches are ethernet devices, we normally wait until the entire frame has been received on the incoming port before we send it out the outgoing port. This causes a delay of one frame time as the ethernet frame passes thru each switch. What is the typical frame time (or delay time) for this type of bridge or switch?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 1500 microseconds Incorrect |  |
|  | b. 120 microseconds Correct |  |
|  | c. 15 microseconds Correct |  |
|  | d. 8 microseconds Incorrect |  |

At 100 Mbps and 1500 bytes in one frame the typical delays are 1500 bytes \* 8 bit/byte divided by 10^8 bit/second = 1.2 \* 10 ^-4 seconds or 120 microseconds.

Incorrect

Marks for this submission: 0/1.

Question4

Marks: 1

What type of signal is found on the two sides of a fiber modem?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Silcon and Rayon Incorrect |  |
|  | b. Electical and High speed Incorrect |  |
|  | c. computer and wide area Incorrect |  |
|  | d. infrared and electrial Correct |  |

The fiber modem has the electrical ethernet on one side and the infrared signal thru the fiber on the other. The modem does not change the frame just converts its energy from electrical to light.

Incorrect

Marks for this submission: 0/1.

Question5

Marks: 1

Our LAN Switches have 128 ports for 100 Mbps ethernet. What is the maximum simultaneous throughput of the switch if all ports are in use?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 128 Mbps Incorrect |  |
|  | b. 6.4 Gbps Correct |  |
|  | c. 12.8 Gbps Correct |  |
|  | d. 64 Gbps Incorrect |  |

Since there are 128 ports we can have 64 ports receiving and 64 ports sending simultaneously. Each of the 64 conversations is going at 100 Mbps so we get 6.4 Gbps total throughput of the switch.Some switches are capable of full duplex on all channels which would make for a data rate of 12.8 Gbps. I gave credit for both answers.

Correct

Marks for this submission: 1/1.

Question6

Marks: 1

What part of the ethernet frame does the Learning Bridge "learn" from?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. The Payload address Incorrect |  |
|  | b. The destination ethernet address in the frame header Incorrect |  |
|  | c. The frame type or LLC header in the frame Incorrect |  |
|  | d. The source address Correct |  |

The learning bridge is trying to discover where stations are located. By looking at the source eithernet address and the wire it came from, the learning bridge can determine the location of any station that is transmitting.

Correct

Marks for this submission: 1/1.

Question7

Marks: 1

Using a network with a bridge between A on the right and B on the left side, after the packet from A to B is handled on a "just out of the box" bridge. What has the Bridge learned?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. That A is on the right segment Correct |  |
|  | b. That A is on the left segment Incorrect |  |
|  | c. That B is not on the right segment Incorrect |  |
|  | d. That A and B are on different segments Incorrect |  |

When the bridge hears the packet from A to B on the right segment it learns that A is on the right segment. Nothing else can be discerned until it hears from another station.

Correct

Marks for this submission: 1/1.

Question8

Marks: 1

After the packet from A to B is handled on a "just out of the box" bridge and the bridge has learned what it can, what does the bridge do with B's response to A?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Nothing A can hear it directly and the bridge has learned where A is Correct |  |
|  | b. Nothing B knows where A is Incorrect |  |
|  | c. It sends the frame to the left segment -- still not sure where A is Incorrect |  |
|  | d. It sends the frame to A on the right segment. Incorrect |  |

When the bridge hears the packet from A to B on the right segment it learns that A is on the right segment. So when B responds back to A, the bridge knows that A is on the right segment and can hear B's frame directly. The bridge does nothing.

Incorrect

Marks for this submission: 0/1.

Question9

Marks: 1

An ethernet repeater will extend a network by:

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Amplifying any electrical signal it sees (including noise) and sending it to the next segment of the network Correct |  |
|  | b. Amplifying only valid ethernet frames Incorrect |  |
|  | c. Amplifying only frames whos destination is on the next ethernet segment Incorrect |  |
|  | d. Changing the ethernet signal to a cleaner signal, less prone to be interpreted as an error packet. Incorrect |  |

The network repeater repeats everything it hears, even noise. It is useful in simple networks but if there is any noise or interference the repeater just amplifies that and causes more errors and collisions on the network.

Correct

Marks for this submission: 1/1.

Question10

Marks: 1

Even smarter learning bridges communicate among themselves to create a hierarchical spanning tree. Why is this necessary?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. To establish the shortest routes between segments Partially correct |  |
|  | b. To speed the bridge learning process Incorrect |  |
|  | c. To ensure that no routing cycles are produced which cause packets to circulate around the network without ever arriving at the destination segment. Correct |  |
|  | d. To allow for broadcast frames to all segments. Incorrect |  |

Since bridges are self learning and so easy to use, they may end up hooked up in a cycle (essentially a path thru the network that ends up back where you started. This means that any bridge may find at least two paths from one segment to another. The bridges may then start changing paths depending on the last source address they heard from their connected segments. This could lead to an unstable network. To prevent this, bridges create a minimum spanning tree that connects all segments but eliminates cycles. This prevents the instability and frames cycling around forever without ever arriving at their destination.

Correct

Marks for this submission: 1/1.

Quiz 18:

Quiz 20:

Quiz 21:

1

Marks: 1

Where is 127.0.0.1?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. On a Class A network Incorrect |  |
|  | b. On a Class B network Incorrect |  |
|  | c. On a Class C network Incorrect |  |
|  | d. Every computer is 127.0.0.1. Correct |  |

127/8 is a loopback address used for testing. It allows you to connect to yourself.

Incorrect

Marks for this submission: 0/1.

Question2

Marks: 1

When you are issued a group of IP numbers, which part of the IP address is fixed and which can be assigned by you?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. The prefix is fixed and you control the suffix Correct |  |
|  | b. Both the prefix and suffix are under your control Incorrect |  |
|  | c. You control the prefix and the suffix is fixed. Incorrect |  |
|  | d. Neither suffix nor prefix are under your control Incorrect |  |

When assigned a range of IP numbers, you control the suffix -- the prefix is fixed.

Correct

Marks for this submission: 1/1.

Question3

Marks: 1

How many unique IP addresses are there?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Unlimited Incorrect |  |
|  | b. Approximately 10 to the 32nd power Incorrect |  |
|  | c. Approximately 4 times 10 to the 16th power Incorrect |  |
|  | d. Approximately 4 times 10 to the 9th power Correct |  |

There are 2 to 32nd unique IP addresses which is 4,294,967,296 or 4 times 10 to the 9th power.

Correct

Marks for this submission: 1/1.

Question4

Marks: 1

What IP address class belongs to Augsburg?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. A Incorrect |  |
|  | b. B Correct |  |
|  | c. C Incorrect |  |
|  | d. D Incorrect |  |
|  | e. E Incorrect |  |

Augsburg has a class B address. Class B addresses begin with 128 and end with 191 for their first decimal address in the number.

Correct

Marks for this submission: 1/1.

Question5

Marks: 1

My computer's IP number is 141.224.159.30. What is that address in binary?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 10001101 11100000 10011111 00011110 Correct |  |
|  | b. 1111000 11100000 10011111 00011110 Incorrect |  |
|  | c. 10001101 11100000 11100000 00011110 Incorrect |  |
|  | d. 11001101 11100000 10011111 00011110 Incorrect |  |

You do the conversion.

Correct

Marks for this submission: 1/1.

Question6

Marks: 1

How many unique addresses are there in the 141.224.159.0/24 subnet?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 16 Incorrect |  |
|  | b. 24 Incorrect |  |
|  | c. 32 Incorrect |  |
|  | d. 256 Correct |  |

The 141.224.159.0/24 subnet has 24 prefix bits and 8 suffix bits. There are 2 to the 8th power unique addresses in this subnet. 2 to 8th power is 256.

Correct

Marks for this submission: 1/1.

Question7

Marks: 1

My computer has the address of 141.224.159.30. What is that address in CIDR designation?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 141.224.159.30/8 Incorrect |  |
|  | b. 141.224.159.30/16 Correct |  |
|  | c. 141.224.159.30/24 Incorrect |  |
|  | d. Cannot be represented in CIDR Incorrect |  |

Since we are a class B network, the first 16 bits are network address so we designate this address as 141.224.159.30/16. The first 16 bits are network and the last 16 bits are host address.

Incorrect

Marks for this submission: 0/1.

Question8

Marks: 1

My computer has the IP address of 141.224.159.30. What is this address in Hexidecimal?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 8D E0 CF 2E Incorrect |  |
|  | b. 8D F0 9F 1E Incorrect |  |
|  | c. 8D EF 9F 1E Incorrect |  |
|  | d. 8D E0 9F 1E Correct |  |

Again, you do the conversion.

Correct

Marks for this submission: 1/1.

Question9

Marks: 1

My computer at Augsburg has the IP number of 141.224.159.30. What is its network number?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 141. Incorrect |  |
|  | b. 141.224 Correct |  |
|  | c. 141.224.159. Incorrect |  |
|  | d. 141.224.159.30 Incorrect |  |

The network number is the suffix or in the case of Augsburg, the first two decimal number 141.224.

Correct

Marks for this submission: 1/1.

Question10

Marks: 1

Which if the below addresses is a private (or "nonroutable") address?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 10.255.255.10 Partially correct |  |
|  | b. 172.24.145.244 Partially correct |  |
|  | c. 192.168.25.10 Partially correct |  |
|  | d. All of the above Correct |  |

All these addresses count as private or non routable addresses.

Correct

Marks for this submission: 1/1.

Quiz 22:

1

Marks: 1

Datagrams should be as large as possible, because?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Large datagrams contain large amounts of data and therefore fewer of them will deliver a specified file. Correct |  |
|  | b. Large datagrams waste little space for header. Partially correct |  |
|  | c. Large datagrams are easier to process at the destination. Incorrect |  |
|  | d. Large datagrams use the physical wiring more efficiently Incorrect |  |

Large datagrams are good when the files are large. Then, fewer datagrams will deliver the entire file and less processing is done at each step to forward the fewer datagrams.

Partially correct

Marks for this submission: 0.5/1.

Question2

Marks: 1

Why do we call the Internet packets "datagrams"?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Their data area (payload) contains all the information needed to deliver the packet Incorrect |  |
|  | b. Their header contains all the information needed to deliver the packet Correct |  |
|  | c. Their payload contains data Incorrect |  |
|  | d. The Internet is not aware of the data contained in the packet. Incorrect |  |

A datagram is a self contained packet. Its header contains enough information to route the datagram. Datagrams, like letters in the mail, have all the addresses they need to direct the delivery of the packet.

Correct

Marks for this submission: 1/1.

Question3

Marks: 1

With a MTU of 1500 bytes. How many fragments will result from an original packet size of 4000 bytes?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 1 Incorrect |  |
|  | b. 2 Incorrect |  |
|  | c. 3 Correct |  |
|  | d. 4 Incorrect |  |

The 4000 bytes will be fragmented into 3 packets.   
1) 1500 bytes (byte 1 to 1500)  
2) 1500 bytes (byte 1501 to 3000)  
3) 1000 bytes (byte 3001 to 4000)

Correct

Marks for this submission: 1/1.

Question4

Marks: 1

So with both big and little datagrams are good for their respective uses, which did the Internet choose?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Big datagrams Incorrect |  |
|  | b. Small datagrams Incorrect |  |
|  | c. Single byte datagrams Incorrect |  |
|  | d. Variable size datagrams Correct |  |

Internet packets can vary from 1 byte to 64 kilobytes depending on what the application uses.

Correct

Marks for this submission: 1/1.

Question5

Marks: 1

How does the receiving system recognize the last fragment in a sequence from a fragmented packet?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. By counting the number of bytes in all the fragments Incorrect |  |
|  | b. By counting the number of fragments Incorrect |  |
|  | c. By counting the number of bytes in all the fragments Incorrect |  |
|  | d. By the "last fragment" bit set on in the IP header Correct |  |

As fragments arrive each is marked "not last" until the last one. The receiving host is to reassemble the original packet from the data.

Correct

Marks for this submission: 1/1.

Question6

Marks: 1

What limits the size of the IP version 4 datagram?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Total Length Parameter in the IPv4 header Correct |  |
|  | b. H.Len parameter in the IPv4 header. Incorrect |  |
|  | c. Specified in the IPv4 standard Incorrect |  |
|  | d. Time to Live parameter in the IPv4 header. Incorrect |  |

The IPv4 datagram header includes 16 bits for the Total Length of the datagram including both header and data.

Incorrect

Marks for this submission: 0/1.

Question7

Marks: 1

With a H.LEN value of 6 and 1 byte of data in the payload of an IP packet, what is the total length of the packet, including header?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 7 Bytes Incorrect |  |
|  | b. 15 Bytes Incorrect |  |
|  | c. 21 Bytes Incorrect |  |
|  | d. 25 Bytes Correct |  |

With a H.LEN = 6 the header is 6 x 4 = 24 bytes. The data is 1 byte long for a total packet length of 25 bytes.

Correct

Marks for this submission: 1/1.

Question8

Marks: 1

If the IP packet type = 006, what does that indicate?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. ethernet packet Incorrect |  |
|  | b. TCP packet Correct |  |
|  | c. UDP packet Incorrect |  |
|  | d. ARP packet Incorrect |  |

A 6 in the IP protocol (or type) field indicates that the contained packet is a TCP packet.

Incorrect

Marks for this submission: 0/1.

Question9

Marks: 1

In what case might a small datagram be more efficient?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. For heavily loaded networks where more small datagrams distribute the network resources more fairly. Incorrect |  |
|  | b. Where messages are small (eg remote network login, and e-mail) Correct |  |
|  | c. Where the network is fraught with errors and therefore less will be lost if a packet is corrupted. Incorrect |  |
|  | d. Where network traffic is very light -- this will load down the network and make more efficient use of the resources.Incorrect |  |

Small datagrams are better where the traffic is made of small bursts. This includes: remote login (each character is sent separately), e-mail (where most messages are a few characters long, and Instant messaging.

Incorrect

Marks for this submission: 0/1.

Question10

Marks: 1

The Time to Live parameter in the IPv4 header is changed when?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. When the packet gets too old to deliver Incorrect |  |
|  | b. Each second the number is decremented. Incorrect |  |
|  | c. It is decremented when received by the destination host. Incorrect |  |
|  | d. It is decremented at each router along the way. Correct |  |

The Time-To-Live parameter starts large at its source and is decremented by one at each router. When the the parameter reaches 0 a message is sent back to the source saying the packet timed out. This prevents packets from circulating forever thru the Internet.

Correct

Marks for this submission: 1/1.

Quiz 23:

1

Marks: 1

Each host maintains an ARP cache to keep copies of MAC/IP address pairs. How does the cache update?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. When an ARP response is heard Correct |  |
|  | b. When an ARP request is heard Correct |  |
|  | c. When an ARP request is sent Incorrect |  |
|  | d. When an ARP request/response conversation is complete Incorrect |  |

TCP/IP listens to all ARP requests and caches the MAC/IP pair from the SENDER. If there is a response that message is also heard that MAC/IP pair is also cached.

Incorrect

Marks for this submission: 0/1.

Question2

Marks: 1

Which hosts on the network respond to an ARP request?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Any computer that knows the mac address for that IP number. Incorrect |  |
|  | b. Any random computer that knows the mac address for that IP number Incorrect |  |
|  | c. The ARP server Incorrect |  |
|  | d. The computer with that IP number. Correct |  |

An ARP request usually asks for the MAC (ethernet) address of the known IP number. Only the computer with that IP number answers.

Correct

Marks for this submission: 1/1.

Question3

Marks: 1

How do routers handle ARP request messages?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. They only forward ARP messages to local subnets Incorrect |  |
|  | b. They never forward ARP requests and never answer. Correct |  |
|  | c. They always forward ARP requests Incorrect |  |
|  | d. They answer ARP requests for the router's IP number. Correct |  |

Routers know what IP numbers they can route. The only ARP message the router needs to respond to is its own IP number.

Incorrect

Marks for this submission: 0/1.

Question4

Marks: 1

DHCP provides what information to a new host computer just coming onto the Internet?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. The host's IP number Partially correct |  |
|  | b. The IP number of the nearest router Partially correct |  |
|  | c. The IP number of the nearest DNS server Partially correct |  |
|  | d. All of the above Correct |  |

DHCP provides: Host IP number, Router (gateway) IP number, and DNS IP number

Partially correct

Marks for this submission: 0.33/1.

Question5

Marks: 1

What is "dynamic" about the Dynamic Host Configuration Protocol?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. It can provide IP numbers to any number of hosts. Incorrect |  |
|  | b. It can assign IP numbers quickly Incorrect |  |
|  | c. It provides IP numbers to specific computers Incorrect |  |
|  | d. It can assign IP numbers from a range of available numbers to any host computer that shows up on the networkCorrect |  |

DHCP can provide an IP number to any computer that requests one. Its predecessor, BOOTP, could only assign IP numbers to MAC addresses that it had in a fixed list. Now anyone with ethernet and the TCP/IP stack can go onto the network and request an IP number.

Correct

Marks for this submission: 1/1.

Question6

Marks: 1

Which ICMP type is used for the ping utility?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 2 = ping response Incorrect |  |
|  | b. 3 = Dest. reachable. Incorrect |  |
|  | c. 0 = Echo Reply Correct |  |
|  | d. 11 = Time Exceeded Incorrect |  |

The ping program uses ICMP (8) for Echo and ICMP (0) for Echo Reply.

Correct

Marks for this submission: 1/1.

Question7

Marks: 1

What is used for the ICMP Echo Reply packet payload?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Time of arrival of the Echo packet Incorrect |  |
|  | b. Same data as the Echo Request payload Correct |  |
|  | c. Nothing -- the packet is empty Incorrect |  |
|  | d. The type of error found Incorrect |  |

To verify that the Echo/Echo Reply system works, ICMP just places the echo packet contents in the payload of the Echo Reply.

Correct

Marks for this submission: 1/1.

Question8

Marks: 1

Since the NAPT can also translate port numbers, how many internal IP addresses can be assigned to one external routable IP numbers for the TCP protocol?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 256 Incorrect |  |
|  | b. 8000 Incorrect |  |
|  | c. 16000 Incorrect |  |
|  | d. 65536 Correct |  |

Since any one IP number can have any TCP port and the port is a 16 bit number, there are 65,536 different internal numbers (IP/Port number pairs) that can be assigned to any one external IP number

Correct

Marks for this submission: 1/1.

Question9

Marks: 1

What does the NAT do for home computer networks?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Converts internal private IP numbers to external private IP numbers Incorrect |  |
|  | b. Convert internal private IP numbers to external public IP numbers Correct |  |
|  | c. Converts internal public IP numbers to external public IP numbers Incorrect |  |
|  | d. Converts class D IP numbers to class A IP numbers Incorrect |  |

NAT translates the addresses in a packet from the private (non routable) IP addresses inside the Local Area Network to public (routable) IP numbers that will traverse the Internet.

Correct

Marks for this submission: 1/1.

Question10

Marks: 1

It would be possible to put the entire Augsburg network behind a NAPT router and run with just a small number of routable IP numbers on the Internet.

Answer:

True CorrectFalse Incorrect

We could easily run Augsburg behind a NAPT router and use just a few IP numbers in the world. This could be done to conserve routable IP numbers since most of the computers on campus don't need well known IP numbers.

Correct

Marks for this submission: 1/1.

Quiz 24:

1

Marks: 1

Match the address type with its typical use.

|  |  |  |
| --- | --- | --- |
| Unicast |  | Correct |
| Multicast |  | Correct |
| Anycast |  | Correct |

Correct

Marks for this submission: 1/1.

Question2

Marks: 1

What is a typical augsburg address in IPv6 format?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 141.224.159.30::0 Incorrect |  |
|  | b. 8DE0:9F1E::0 Correct |  |
|  | c. 0::8DE0:9F1E Incorrect |  |
|  | d. 0::141.224.159.30 Incorrect |  |

Converting IPv4 dotted decimal into Hex we just apply the IPv4 address to the first 32 bits of the address and set the rest of the address to 0 (using ::0)

Correct

Marks for this submission: 1/1.

Question3

Marks: 1

IP v 6 headers are "extensible". What does that mean?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Headers can be of any length Incorrect |  |
|  | b. Headers can be extended to the end of the packet Incorrect |  |
|  | c. Headers can extend the meaning of a packet Incorrect |  |
|  | d. Headers can be chained together with one following the next, each adding meaning to the packet Correct |  |

We can extend the headers by adding more headers in sequence. Each header can have a different meaning for the enclosed data.

Incorrect

Marks for this submission: 0/1.

Question4

Marks: 1

IP v 6 fragmentation occurs where along the path of a datagram?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. At the sending host Correct |  |
|  | b. At the first router in the Internet path Incorrect |  |
|  | c. At the last router in the Internet path Incorrect |  |
|  | d. At the destination host Incorrect |  |

IP v 6 doesn't fragment along the Internet path. The sender sends out successively larger packets until the packet is too large for the intended path. The sender then uses packets always smaller than the smallest MTU along the path. This unloads the routers from having to fragment and keep track of many data paths and their MTU's.

Correct

Marks for this submission: 1/1.

Question5

Marks: 1

How many unique IP v 6 addresses are available?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 2 to the 32nd power Incorrect |  |
|  | b. 2 to the 64th power Incorrect |  |
|  | c. 10 to the 32nd power Incorrect |  |
|  | d. 2 to the 128th power Correct |  |

There are 128 bits in the IP version 6 address. There are 2 to the 128th power addresses in IP v 6. That is about 3.40282367 × 1038 addresses**.**

Correct

Marks for this submission: 1/1.

Question6

Marks: 1

My computer's address in IPv4 is 141.224.159.30. What is it in IPv6?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Unknown -- there is no translation from IPv4 to IPv6 addresses Incorrect |  |
|  | b. 141.224.159.30::0 Incorrect |  |
|  | c. 8D:E0:9F:1E::0 Incorrect |  |
|  | d. 0::8D:E0:9F:1E Correct |  |

IPv4 unicast addresses make up the lowest addresses of the IPv6 space. Any address that begins with 96 0's is the IPv6 version of the IPv4 address in the next 32 bits. Of course that also has to be converted to hexidecimal since IPv6 addresses are rendered in Hex to keep them different from the dotted decimal of IPv4.

Incorrect

Marks for this submission: 0/1.

Question7

Marks: 1

Which is not a reason for development of a replacement protocol for IP version 4?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. IP v 4 has too few addresses Incorrect |  |
|  | b. IP v 4 has only one header format Incorrect |  |
|  | c. IP v 4 has no facilities for real time applications Incorrect |  |
|  | d. IP v 4 error correction is not sufficient Correct |  |

All the reasons above were reasons for IP v 4 development, except the error correction. IP v 4 has a checksum in its header and since the physical layers already did error detection it is not necessary for the IP layers to have their own error detection.

Incorrect

Marks for this submission: 0/1.

Question8

Marks: 1

What is the theoretical maximum length of an IPv6 datagram?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 40 bytes -- see figure 24.3 Incorrect |  |
|  | b. 65,636 bytes -- limited by the PAYLOAD LENGTH field length Incorrect |  |
|  | c. 2 to the 128 bytes -- limited by the size of the address field Incorrect |  |
|  | d. Unlimited -- it can have as many extension headers as you want, only the payload is limited in size Correct |  |

The IPv6 datagram is not limited in size. The payload can be no longer than 65,536 bytes (due to the number of bits in the PAYLOAD LENGTH field). However, there is no limit to the number of headers at the front of the datagram. We could have thousands of headers (each 40 bytes long) and stretch the datagram to any length.

Incorrect

Marks for this submission: 0/1.

Question9

Marks: 1

What is the purpose of the TRAFFIC CLASS segment of the IPv6 header?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. To designate the type of communication of the datagram. To give the network some idea of how to handle the packet. Correct |  |
|  | b. To designate the importance of the packet and be sure that the network never drops this packet. Partially correct |  |
|  | c. To designate the route of this packet and ensure it is sent over the same route as all the others in this stream. Incorrect |  |
|  | d. To designate a packet from someone who has to received a ticket and is now limited in their internet use Incorrect |  |

TRAFFIC CLASS is to differentiate interactive, stream and bulk data packets in an attempt to better handle packet streams that cannot experience delay or lag. This is just in the experimental stage and may not really amount to anything once the network is all IPv6.

Incorrect

Marks for this submission: 0/1.

Question10

Marks: 1

IPv6 has been implemented in most operating systems and networks.

Answer:

True CorrectFalse Incorrect

IPv6 has been implemented by most operating systems and networks. It is only lightly used as most applications do not need any more than unicast addresses and one-to-one connections.

Correct

Marks for this submission: 1/1.

Quiz 25:

1

Marks: 1

Match the UDP port numbers with their well known usage.

|  |  |  |
| --- | --- | --- |
| echo |  | Correct |
| timeserver |  | Correct |
| domain name service |  | Correct |
| ping |  | Correct |
| DAYTIME |  | Correct |

Correct

Marks for this submission: 1/1.

Question2

Marks: 1

The UDP datagram is normally encapsulated how?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Inside an ethernet frame Incorrect |  |
|  | b. Inside an ethernet frame which is inside an IP datagram Incorrect |  |
|  | c. Inside an IP packet which is inside an ethernet frame Correct |  |
|  | d. Inside an echo reply packet Incorrect |  |

The UDP datagram is encapsulated inside an IP datagram which is inside an ethernet (or other physical) frame.

Correct

Marks for this submission: 1/1.

Question3

Marks: 1

What is meant by and "end-to-end" protocol?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Only the end point computers (eg server and client) decode and use the headers and data of this protocol. Correct |  |
|  | b. This protocol is not in effect until the end computers have been notified Incorrect |  |
|  | c. All the computers and routers along the entire route decode and use this header Incorrect |  |
|  | d. This protocol is in effect from one end of the conversation to the other Incorrect |  |

UDP is an example of an end-to-end protocol that is only decoded and acted on by the end point machines. All of the other computers, routers, bridges, etc. in the path of the datagram ignore the UDP header and payload. They just deliver the message and let the end point machines act on it.

Incorrect

Marks for this submission: 0/1.

Question4

Marks: 1

What if the UDP datagram is too large for the existing network? What happens?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. The IP layer will fragment the UDP packet before sending it over the network Correct |  |
|  | b. The ethernet layer will fragment the UDP packet before sending it over the network Incorrect |  |
|  | c. The transport layer will fragment the UDP packet before sending it over the network Incorrect |  |
|  | d. The packet will be rejected and not travel over the network Incorrect |  |

If a UDP packet is too large for the underlying network, it will be fragmented by the IP layer and transmitted as a number of IP packets. It is up to the receiving station to reassemble the UDP packet and present it to the receiver's transport layer.

Correct

Marks for this submission: 1/1.

Question5

Marks: 1

How many UDP ports does a server with a single IP number have?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 16 Incorrect |  |
|  | b. 32 Incorrect |  |
|  | c. 512 Incorrect |  |
|  | d. 65,536 Correct |  |

The port number is a 16 bit number so there are 65,536 of them for UDP on any one IP number.

Correct

Marks for this submission: 1/1.

Question6

Marks: 1

What is the advantage of producing large datagrams for the Internet?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. The larger datagram has more data with the same size of header and is more efficient to get data thru the network. Correct |  |
|  | b. Larger datagrams travel faster down the ethernet. Incorrect |  |
|  | c. Larger datagrams allow us to mix data from many applications in the same packet Incorrect |  |
|  | d. Larger datagrams can contain larger headers with more delivery information Incorrect |  |

Since the size of the headers remains the same, if we increase the size of the data payload we will waste a smaller percentage of the time on overhead. The larger datagram has a smaller percentage of overhead and thus more quickly delivers the message to its destination.

Correct

Marks for this submission: 1/1.

Question7

Marks: 1

If two computers are communicating via UDP datagrams, how does the receiving computer know the sending computer has stopped sending data in mid-stream?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. The sending computer sends a terminate notice Incorrect |  |
|  | b. The receiving computer loses contact Incorrect |  |
|  | c. The sending computer signal is lost Incorrect |  |
|  | d. It doesn't really know as there are no control packets in the UDP protocol. The receiving computer must just wait until it should have expected and answer and then assume the sending computer has died. Correct |  |

When the packets stop, there is no control message send from sender to receiver. The receiver must have some time-outs running and assume that it has heard nothing for an appropriate amount of time and that the sender has quit.

Correct

Marks for this submission: 1/1.

Question8

Marks: 1

What is meant by a message oriented protocol?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Datagrams can only contain instant messages Incorrect |  |
|  | b. Datagrams must be a complete message that stands alone and don't depend on other datagrams before or after them. Correct |  |
|  | c. Messages in the datagrams are limited to text and images Incorrect |  |
|  | d. The receiving station must acknowledge with a proper message. Incorrect |  |

UDP datagrams are self-contained messages. They stand by themselves and don't depend on messages before or after them. A UDP datagram cannot be a fragment of a larger UDP datagram.

Correct

Marks for this submission: 1/1.

Question9

Marks: 1

What is the purpose of the port numbers in the UDP header?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Designates the type of operating system used by the destination machine Incorrect |  |
|  | b. Designates the type of service needed by that datagram Incorrect |  |
|  | c. Designates the speed that is needed for proper delivery of the datagram Incorrect |  |
|  | d. Designates the application/window/task/thread that has created or is expecting the delivery of the datagram Correct |  |

Each application/thread/window/task that initiates a data transfer over the Internet registers with the operating system and asks for a port number to monitor. When data is sent by the application, that port number is appended to the UDP datagram by the operating system. When a datagram is received, the operating system reads the port number in the UDP header and delivers the datagram to the appropriate application/thread/task/window.

Correct

Marks for this submission: 1/1.

Question10

Marks: 1

When can a UDP datagram be sent to a destination computer?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. After a connection has been established between machines Incorrect |  |
|  | b. After the destination computer has been notified that a datagram is coming Incorrect |  |
|  | c. At any time, there is no set up and connection time for UDP datagrams Correct |  |
|  | d. Whenever the source and destination computers are synchronized Incorrect |  |

UDP is a connectionless protocol meaning that there is no setup or connection necessary for the protocol to start sending data. In fact, only data packets are sent in UDP and the receiving computer is expected to be ready for them at any time.

Correct

Marks for this submission: 1/1.

Quiz 26:

1

Marks: 1

If computer A sends 20 bytes in a TCP datagram that contains a SEQUENCE NUMBER of 4254. What will computer B send back as an ACKNOWLEDGEMENT NUMBER?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 4254 Incorrect |  |
|  | b. 4573 Incorrect |  |
|  | c. 4274 Correct |  |
|  | d. 4275 Incorrect |  |

The ACKNOWLEDGEMENT NUMBER is the byte number of the next expected byte.(Comer calls this "first sequence number for which data is missing") This may require you taking off your shoes and socks but bear with me. The SEQUENCE number of A's first byte is 4254. That and 19 more bytes are sent 4254 thru 4273. Then B's counter has advanced to 4274 and that is the next expected byte and the ACKNOWLEDGEMENT NUMBER that B sends. A just matches that number with its SEQUENCE NUMBER and knows that all of the sent bytes have been acknowledged.

Incorrect

Marks for this submission: 0/1.

Question2

Marks: 1

What is meant by a connection oriented protocol?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Data is transfered only after an exchange of packets between the server and client, and only while the connection remains. Correct |  |
|  | b. The sending and receiving computers must be directly connected to exchange data Incorrect |  |
|  | c. The sending and receiving computers can have only one connection between themselves when transferring data.Incorrect |  |
|  | d. There must be an intermediate computer between the sending and receiving system to connect the two computers Incorrect |  |

Before data are transfered in a connection oriented protocol, the two machines must exchange a setup sequence of packets. This insures that both machines are ready and able to exchange data.

Correct

Marks for this submission: 1/1.

Question3

Marks: 1

What is the sequence of packets sent when two computers establish a TCP connection?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. SYN, ACK, SYN Incorrect |  |
|  | b. SYN, SYN+ACK, ACK Correct |  |
|  | c. SYN, ACK, SYN, ACK Incorrect |  |
|  | d. FIN+ACK, FIN+ACK,ACK Incorrect |  |

The sequence send is: SYN, ACK+SYN, ACK in the three way hand shake to establish a TCP connection

Correct

Marks for this submission: 1/1.

Question4

Marks: 1

The TCP sequence number designates:

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Which packet this is beginning with the first packet number 1 Incorrect |  |
|  | b. Which computer this is that has made a TCP connection numbered from 1 Incorrect |  |
|  | c. Which bytes of data are in the packet numbered from 1 Incorrect |  |
|  | d. Which bytes of data are in the packet numbered from a random number exchanged when the TCP connection is made Correct |  |

The sequence number begins with a random number at connection time and is incremented every byte of data transmitted in the TCP datagram.

Incorrect

Marks for this submission: 0/1.

Question5

Marks: 1

What is the advantage of the sliding window protocol?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Allows more than one conversation over the same TCP connection before it must be acknowledged. Incorrect |  |
|  | b. Allows larger packets to flow between sender and receiver before they must be acknowledged. Incorrect |  |
|  | c. Allows the receiver to collect more packets before it has to acknowledge any sent. Incorrect |  |
|  | d. Allow the sender to send more packets before the first one is acknowledged Correct |  |

If the network is large and the packets small the sender may have to wait long times for an individual packet to be acknowledged. By putting more than one packet out before the acknowledgement is received, the network can be fully utilized and data arrive at the destination more quickly.

Incorrect

Marks for this submission: 0/1.

Question6

Marks: 1

How does the TCP protocol know the network is congested?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Packets arrive fragmented at the destination Incorrect |  |
|  | b. Packets arrive late at the destination (or not at all) Correct |  |
|  | c. Packets are marked by routers when they are delayed along the way Incorrect |  |
|  | d. Packets arrive with that frazzled look of an airline passenger who has just spent 8 hours on the tarmac at Rochester, MN. Incorrect |  |

Each receiving station starts a timer when packets are transmitted. If the acknowledgement for that packet is not received within a reasonable amount of time it assumes the packet lost and slows down the network by reducing the rate it sends data and making the advertised window smaller so the other machine sends less data before acknowledgement.

Incorrect

Marks for this submission: 0/1.

Question7

Marks: 1

TCP heads off congestion by shrinking the size of its advertised window. This causes the other machine to send fewer packets and unload the network. If the network is very congested the TCP window may shrink to ZERO. If both stations get down to a ZERO window size, how do they ever get started again since they cannot send data?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. TCP allows zero or small data packets to be sent to probe the network and see if the congestion has eased. Correct |  |
|  | b. TCP terminates the connection if the window size reaches zero Incorrect |  |
|  | c. TCP never sets the window to zero to prevent just this problem Incorrect |  |
|  | d. TCP increases the window size automatically after 2 seconds Incorrect |  |

This is called the silly window syndrome and is prevented by allowing the TCP connection to send small window packets occasionally to probe the network and see if the windows can be expanded.

Correct

Marks for this submission: 1/1.

Question8

Marks: 1

Which end of the TCP connection can terminate the connection?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Either end Correct |  |
|  | b. The end which created the original SYN packet on connection Incorrect |  |
|  | c. The end which created the SYN+ACK packet on connection Incorrect |  |
|  | d. Neither end, it must end by timing out. Incorrect |  |

To allow for full control of the TCP connection, it is designed so that either end of a connection can terminate it. If either end sends a FIN+ACK, the other will respond with a FIN+ACK and then an ACK is send terminating the connection.

Correct

Marks for this submission: 1/1.

Question9

Marks: 1

Connect to port 5193 of yspace.augsburg.edu using a TCP program such as telnet. you have to do this on campus because off campus this port is blocked. What do you get back from the server?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Nothing, you cannot connect manually to a TCP server Incorrect |  |
|  | b. This server has been contacted X times. (this is the correct answer) Incorrect |  |
|  | c. Connection closed by foreign host Partially correct |  |

yspace.augsburg.edu is running a server waiting for you to connect. It should respond with "Go away and stop bothering me" on port 5193. You also get a message saying that the "Connection closed by foreign host" but that comes from your machine when it gets a FIN+ACK packet to shutdown the connection.

Correct

Marks for this submission: 1/1.

Question10

Marks: 1

TCP calculates the round trip time of a connection when the connection is made and assumes that any packets that are later than that time are lost. In other words, TCP assumes that round trip times are fixed once the connection is made.

Answer:

True IncorrectFalse Correct

TCP dynamically adjusts the round trip time for every connection. If the connection slows down it will lengthen the time it waits for acknowledgement. This prevents loading an already overloaded network with retransmissions.

Incorrect

Marks for this submission: 0/1.

Quiz 27:

Quiz 28:

Quiz 29:

1

Marks: 1

Match the VoIP gateways with their use.

|  |  |  |
| --- | --- | --- |
| Media Gateway |  | Incorrect |
| Media Gateway Controller |  | Correct |
| Signaling Gateway |  | Incorrect |

Partially correct

Marks for this submission: 0.33/1.

Question2

Marks: 1

Match these RTP Header fields with their use

|  |  |  |
| --- | --- | --- |
| Sequence Number |  | Correct |
| Timestamp |  | Correct |
| Synchronization Source |  | Correct |
| VER |  | Correct |
| PAYTYPE |  | Correct |
| CC |  | Correct |

Correct

Marks for this submission: 1/1.

Question3

Marks: 1

My office number is             612 330 1061       on the PSTN. What is it on the Internet?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 6.1.2.3.3.0.1.0.6.1.e164.arpa Incorrect |  |
|  | b. 1.6.0.1.0.3.3.2.1.6.e164.arpa Correct |  |
|  | c.             612 330 1061       Incorrect |  |
|  | d. 141.224.159.30:            612 330 1061       Incorrect |  |

E164 conversion of PTSN numbers to Internet numbers is done by reversing the number and adding .e164.arpa to the end. This is the same as we do with Internet domain (high order domain name is on the right). [www.augsburg.edu](http://www.augsburg.edu/). A little confusing but you will still enter the            612 330 1061       into the software and it will do the conversion to the E.164 number.

Correct

Marks for this submission: 1/1.

Question4

Marks: 1

How can you recognize when jitter has increased in your Internet connection when using RealPlayer or iTunes from a remote machine?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Music stops and you get a "rebuffering" message Correct |  |
|  | b. Music repeats some measures Incorrect |  |
|  | c. Music slows down Incorrect |  |
|  | d. Jitter cannot happen with RealPlayer or iTunes Radio Incorrect |  |

If RealPlayer or iTunes has determined an average jitter amount it will buffer data for that long before presenting it to the speaker. If jitter becomes significantly longer it will stop playing and issue a "rebuffering" message to tell you that it will wait even longer for packets to arrive before playing

Correct

Marks for this submission: 1/1.

Question5

Marks: 1

How would you find an RTP packet encapsulated?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Inside a TCP packet, inside an ethernet frame Incorrect |  |
|  | b. Inside a UDP packet, inside an IP packet, inside an ethernet frame Correct |  |
|  | c. Inside an IP packet, inside an ethernet frame Incorrect |  |
|  | d. Inside an RTP packet, inside a UDP packet, inside an ethernet frame. Incorrect |  |

As in figure 29.2 the RTP packet is found inside a UDP packet, inside an IP packet, inside an ethernet frame.

Correct

Marks for this submission: 1/1.

Question6

Marks: 1

What number is used for the first RTP packets Sequence Number?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 0 Incorrect |  |
|  | b. 255.255.255.255 Incorrect |  |
|  | c. The size of the first packet in bytes Incorrect |  |
|  | d. A random 16 bit number Correct |  |

All IP sequence numbers start with random numbers to prevent successive connections from getting confused by a new connection with similar SEQUENCE NUMBERS

Correct

Marks for this submission: 1/1.

Question7

Marks: 1

What is the purpose of Signaling in VoIP?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Manages the bandwidth used by the phone call Incorrect |  |
|  | b. Manages the connection, disconnection, busy signal, etc. of a call Correct |  |
|  | c. Informs the receiving phone that data is arriving Incorrect |  |
|  | d. Signals the phone system that there is a problem with the connection. Incorrect |  |

Signaling is the management function of the VoIP system. It looks up the phone number, make connections, forwards calls, sends busy signals, disconnects the phones. It does everything but send the voice signals between phones.

Correct

Marks for this submission: 1/1.

Question8

Marks: 1

SIP provides what function for VoIP?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Provides Quality of Service control Incorrect |  |
|  | b. Provides signaling service to VoIP calls Correct |  |
|  | c. Provides error messages when phone packets are lost Incorrect |  |
|  | d. Interfaces the IP phones with analog phones Incorrect |  |

The signaling protocol to establish and disconnect an IP call is provided using a sequence of messages in SIP. This allows us to look up the phone's location, ring, start and end the connection.

Correct

Marks for this submission: 1/1.

Question9

Marks: 1

When using VoIP, how often is your voice signal sampled?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 3000 samples/ second Incorrect |  |
|  | b. 8000 samples/second Correct |  |
|  | c. 15000 samples/second Incorrect |  |
|  | d. 30000 samples/second Incorrect |  |

To reproduce voice signals, we have to sample at twice the rate of the highest frequency that is to be heard at the far end. Since your voice is recognizable if we can hear the frequencies from 300 to 3300 hz we sample at 8,000 samples per second. Each sample is an 8 bit number and this makes 64,000 bits/second to digitize your voice in PCM.

Correct

Marks for this submission: 1/1.

Question10

Marks: 1

VoIP uses Pulse Code Modulation what does that mean?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Pulses sent down the wire proportional to the amplitude of the voice Incorrect |  |
|  | b. Pulses sent down the wire to represent the binary amplitude of your voice at sample time Correct |  |
|  | c. Pulses sent at a rate proportional to your voice amplitude Incorrect |  |
|  | d. Pulses sent proportional to your voice frequency Incorrect |  |

The amplitude of your voice is sampled at a continuous rate. Each sample amplitude is converted to a binary number with 0000 being a small amplitude and 1111 being a large amplitude, for example.

Correct

Marks for this submission: 1/1.

Quiz 30:

1

Marks: 1

How can you use ARP to break into a communication on the Internet?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Broadcast ARP messages to slow the network Incorrect |  |
|  | b. Send ARP messages indicating that the requested ethernet address is not available Incorrect |  |
|  | c. Send ARP messages indicating that you are the desired TCP port number Incorrect |  |
|  | d. Send ARP messages indicating that your ethernet number is at the desired IP address Correct |  |

Spoofing involves fooling the sending machine into thinking that you are the IP number it is looking for. For example, if someone wanted to login to augnet. (141.224.64.100) they will send an ARP message asking who is 141.224.64.100? You respond with your ethernet address as the correct ethernet address for 141.224.64.100 and the sender will login to your (not augnet's) web server and give up their passwords.

Correct

Marks for this submission: 1/1.

Question2

Marks: 1

How do you verify that connecting to www. wellsfargo.com for banking is really connecting to the bank's computer?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Wells Fargo's IP numbers are secure Incorrect |  |
|  | b. You exchange a certificate with a third party that knows wellsfargo.com's public key. Correct |  |
|  | c. You exchange encrypted packets with [www.wellsfargo.com](http://www.wellsfargo.com/) Incorrect |  |
|  | d. You verify the ethernet address of the wellsfargo.com computer Incorrect |  |

Third party certificate holders (such as Verisign) securely pass you the public key for wellsfargo.com. That key is only useful for certain registered servers (by number) and only [www.wellsfargo.com](http://www.wellsfargo.com/) knows the private key to create communication with you once you know its public key.

Incorrect

Marks for this submission: 0/1.

Question3

Marks: 1

What constitutes a Denial of Service attack on a host computer.

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Disconnect a host from the Internet Incorrect |  |
|  | b. Send big packets to a host Incorrect |  |
|  | c. Send packets that are too small to the host Incorrect |  |
|  | d. Send so many packets to the host that it cannot serve legitimate users. Correct |  |

DoS attacks usually involve many machines on the Internet all sending packets to the same host. That host is spending so much time attempting to decode the messages that it cannot service legitimate users.

Correct

Marks for this submission: 1/1.

Question4

Marks: 1

What makes a digital signature secure?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Only the receiver can decode the message and get the correct signature value Incorrect |  |
|  | b. Only the sender could have sent and encrypted the message using their private key, the receiver uses the public key from the known sender Correct |  |
|  | c. Only the sender can read the message Incorrect |  |
|  | d. The receiver recognizes the sender's key in the message Incorrect |  |

When decoded with a known public key, only the sender could have created that message since it was the sender's public key. Only the sender knows the private key that created the message.

Correct

Marks for this submission: 1/1.

Question5

Marks: 1

How can firewalls prevent intrusion into your network?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Blocking certain ethernet addresses from use on the network Incorrect |  |
|  | b. Blocking certain applications from sending packets into your network Incorrect |  |
|  | c. Blocking or allowing certain IP numbers and port numbers from being accessed Correct |  |
|  | d. Blocking or allowing TCP connections from entering your network. Incorrect |  |

Usually firewalls have a list of IP numbers and ports that are either allowed or forbidden to enter the network.

Incorrect

Marks for this submission: 0/1.

Question6

Marks: 1

Can you use encryption to detect a man-in-the-middle attack?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Yes, the middle machine cannot properly encrypt the messages as they pass thru Incorrect |  |
|  | b. Yes, the middle machine would cause undue delay in the encryption/decryption time. Incorrect |  |
|  | c. No, the middle machine just passes the encrypted message through Incorrect |  |
|  | d. No, the middle machine uses one encryption between it and the server and another between it and the source.Correct |  |

The man-in-the-middle creates two encrypted streams, one on each side. This means that the man-in-the-middle can read the stream and you cannot detect it. The only way to prevent a man-in-the-middle attack is to have some secure authentication between the server and source that the man-in-the-middle cannot corrupt.

Incorrect

Marks for this submission: 0/1.

Question7

Marks: 1

How many keys are involved when two machines communicate using a private key encryption system?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 1 Correct |  |
|  | b. 2 Incorrect |  |
|  | c. 3 Incorrect |  |
|  | d. 4 Incorrect |  |

Private key systems use one key that both ends of the communication know. The sender uses the key to encrypt and the receiver uses the same key to decrypt. The only real problem is how to get the private key distributed to all users without compromise.

Correct

Marks for this submission: 1/1.

Question8

Marks: 1

How many keys are used when two computers communicate using Public Key Encryption?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 1 Incorrect |  |
|  | b. 2 Incorrect |  |
|  | c. 3 Incorrect |  |
|  | d. 4 Correct |  |

This system uses 4 keys. Each end has a private key (that never leaves the machine) and a public key (that is freely broadcast wherever it might be needed. See figure 30.6.

Correct

Marks for this submission: 1/1.

Question9

Marks: 1

Why not just sent one public key out to all of your friends and they can encrypt using that key? Only you can read that message. Wouldn't that be secure enough?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Yes, it would work fine Incorrect |  |
|  | b. Yes, but it is only one-way communication. Incorrect |  |
|  | c. It doesn't work because someone could intercept you public key and read the message Incorrect |  |
|  | d. It would work fine, but anyone could spoof as a source of the message and there is no guarantee the source of the message is who it says it is. Correct |  |

Giving out your public key is fine, but anyone can write you a message and you don't know who the message came from. That is why the public key system uses 4 keys. By getting the public key from a known user, when you decode the message you know who it came from.

Incorrect

Marks for this submission: 0/1.

Question10

Marks: 1

What form do VPN packets take over the public Internet?

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. IP packets from one router to another with encrypted contents Correct |  |
|  | b. IP packets from the source machine to the destination machine with encrypted contents Incorrect |  |
|  | c. TCP packets from one host to another with encrypted contents Incorrect |  |
|  | d. IP packets broadcast to all host on the destination network. Incorrect |  |

For virtual private networks, the source packet begins on one network and is destined for another distant network. The packet is routed to the local router where it is encrypted and put in another packet to the distant router. The distant router decrypts the message an puts it on its local network for ultimate delivery.

Correct

Marks for this submission: 1/1.

Quiz 31/32:

Final: