In an IPv4 address (___.___.____.) each of the four numbers ranges from 0 through what upper limit?

Which network type (peer-to-peer, star, token ring, Ethernet) has every machine connected to exactly two neighbors?

In an Ethernet network, does the entire network fail if one of the computers crashes and disconnects?

When you request a Web page from the Internet, does the machine hosting the page represent the client or the server?

Of the image file types .BMP, .GIF, .JPG, and .PNG, which one supports both millions of colors and transparency?

Of the image file types .BMP, .GIF, .JPG, and .PNG, which ones are recommended for use in Web pages?

Of the image file types .BMP, .GIF, and .JPG, which one is best for cartoons and line art?

What color does the HTML code "#000000" refer to?

Does case (upper case and lower case) matter in UNIX commands?

What are the permissions on a UNIX file after typing the command chmod 406 filename? (Use the rwxrwxrwx form.)

10 Points – I want an HTML color with the red value set to 247, the green value set to 19, and the blue value set to 239.

What is the HTML color code (6 points)?
10 Points – Here is a URL (web address) for a page I want. Point out in the URL the **host address**, the **protocol**, the **file path**, and the **username** (underline and label each section). There is no filename specified, so write into the URL the name of the actual file that will be fetched by default.


15 Points – Write a **fragment** of HTML (NOT a complete Web page) that defines a table to look as shown to the right:

```
<table>
<thead>
<tr>
<th>cat</th>
<th>dog</th>
</tr>
</thead>
<tbody>
<tr>
<td>bat</td>
<td></td>
</tr>
<tr>
<td></td>
<td>snake</td>
</tr>
</tbody>
</table>
```
15 points – find, identify and fix all of the errors in the following html web page:

<html>
  <head>
    <title> My Web Page</title>
  </head>
  <body background="#FF00FF">
    <center>
      <h2>Welcome to my Page!</h2>
    </center>
    Here is my spiffy Web page. I hope you <b>really</b> like it, and come back often.
    Here are favorite links:
    <br>
    <a src="MyPicture.jpg">
      Click to see my photograph
    </a>
    <a href="http://www.yahoo.com">
      <img src="Yahoo.gif" title="My Yahoo Button">
    </a>
  </body>
</html>
Earlier Exams

True/False Questions (2 pts each):

1. High-bandwidth net access is faster than low-bandwidth access.
2. Client/server interactions are always initiated by clients.
3. The BMP file format is recognized by all Web browsers.
4. Employers can legally monitor all e-mail sent to or from company computers.
5. A good computer password should contain numbers as well as letters.
6. Only computer programmers need to know about AUPs.
7. The Lynx Web browser does not display images.
8. You can pass along an e-mail virus (or worm) without knowing it.
9. There is nothing you can do about a “404 Not Found” error.
10. Whenever you receive an e-mail virus warning, you should forward it to all your friends.
11. POP and IMAP are two different e-mail protocols.
12. All Web browsers display the same Web page the same way.
13. An <H1> heading is larger than an <H2> heading.
14. All absolute URLs can be replaced with relative URLs.
15. Web browsers download files from Web servers.
16. Sealing an image down reduces its bandwidth requirements.
17. Web browsers normally ignore carriage returns in HTML files.
Multiple Choice Questions (4 pts. each). Circle the letter of the best answer.

22. A domain name server (DNS) is used to ...
   (a) find fast routes between Internet hosts.
   (b) keep track of user passwords.
   (c) report server problems to ISPs.
   (d) translate domain names into IP numbers.

25. When you create an .html file,
   (a) the BODY element goes inside the HEAD element.
   (b) the HEAD element goes inside the BODY element.
   (c) the TITLE element goes inside the BODY element.
   (d) the TITLE element goes inside the HEAD element.

26. 1,000 pages of single-spaced text (60 lines per page, 110 characters per line) ...
   (a) will consume less than 1 MB of memory.
   (b) will consume roughly 6 MB of memory.
   (c) will consume roughly 60 MB of memory.
   (d) will consume roughly 600 MB of memory.

27. Your browser's stop button is useful when ...
   (a) your browser appears to get "stuck" during a Web page download.
   (b) your browser won't quit when you try to exit or close the application.
   (c) you want to close the current browser window.
   (d) your computer seems to be frozen.

28. Tables are most often used on Web pages ...
   (a) to create a small scrollable window inside a Web page.
   (b) to receive input from users.
   (c) for controlling the overall layout of a Web page.
   (d) for displaying lots of numerical data.

30. HTML has elements ...
   (a) that allow users to set their browser preferences.
   (b) for creating both enumerated and bulleted lists.
   (c) that can change screen resolution settings on computer monitors.
32. Which is the more robust design for network communications: a hierarchical network or a heterarchical network? Explain your answer. Show the difference between the two types of networks by drawing a picture of each one (be careful to label each picture).

1-6 points) This question is to demonstrate your understanding of the structure of a web page. For this question write the complete HTML necessary to create a web page with title: 'the title' and the words: 'in the body' in the body of the page.

Assume that the answers to all of the following questions appear in the body of an HTML document unless otherwise specified.

2-6) Write the code necessary to create the following line in a web page:
'This question distinctly reminds me of a homework problem.'

3-6) Write the code necessary to put the image found at www-edlab.cs.umass.edu/cs120/image.jpg into a webpage.

5-3) What is the hexadecimal code for blue?

6-6) Write the HTML to create two lists, one with numbers and one with bullets. Each list should contain the items item1, item2, and item3.

8-6) Write the code necessary to create a link within a web page. The link should function so that the user is taken to the location 'www.umass.edu' when the image 'clickMe.jpg' is clicked. The image 'clickMe.jpg' is located in the same folder as the web page.
Question 9 – 21 points
Draw the webpage that would be created by the following, and include description of likes and images:
<html>
    <head>
        <title>Question 9</title>
    </head>
    <body>
        <h6>Wow, so this is the size that all spam gets me!</h6>
        <a href="#ed">I am just normal text ... </a>
        <a href="http://www.cs.umass.edu">For a good time click me</a>
        <img src="Yahoo.gif" align="center">
        <a name="ed">Am I worth it?</a>
    </body>
</html>
10-18) Write a complete web page which includes the following:

1. the words 'I love exams' in the top bar of the browser.
2. a red background
3. a table with
   - 4 rows
   - 2 columns per row
   - each box labeled with its row and column number
   - a border of 6 pixels
Section 1. Questions related to html coding and webpages.

For questions 1-7, assume you created a file named “example.html” that includes the following html code (I have included line numbers for reference):

```html
doctype html public "//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd">
<html>
<head>
title>An Example File</title>
</head>
<body>
<p>This is an excellent example of a website.<br>This is a picture of President Obama<br></p>
</body>
</html>
```

1. Where in your file system on the Ed Lab server would you put this file to ensure that it be rendered by a browser? [5 pts]

2. What URL would you enter in the browser to display this webpage? [5 pts]

3. Label the protocol, the host address, and the username in the above URL [5 pts]

4. Provide an html fragment replacing line 9 that links the word “website” to the URL http://www.cs.umass.edu, in other words the following is displayed and website is a link to the URL [5 pts]

   This is an excellent example of a website.

5. Provide an html fragment following line 10 that inserts the image located at the URL http://www.businesspundit.com/wp-content/uploads/2009/01/obama.jpg that is scaled to 100x150 pixels, in other words the following is displayed [5 pts]:

   This is a picture of President Obama

   Don’t take off for no <br>
6. Suppose you had a legal copy of the image in the directory ~yourname/public_html/Images/obama.jpg, how would you modify your answer in 5 above to use relative addressing for the image. [5 pts]

7. Provide an html fragment that adds emphasis to the word “excellent” in line 9, in other words the following is displayed [5 pts]:

This is an **excellent** example of a website.

8. I want to display the following table and propose the following html. Please correct. Note that the image (“Fruit_Candles.jpg”) is located in ~yourname/public_html and should be scaled 50x50 pixels [15 pts].

```html
<html>
<head>
<title> Table Example </title>
</head>
<body>
<table border="1" cellspacing="0" cellpadding="10">
<tr align="left center">
<th bgcolor="#FFFFFF" rowspan =2><img src="Images/Fruit_Candles.jpg" width="200" Height="50"></th>
<th bgcolor="#CCCCCC" colspan ="3">Costs in various packaging</th>
</tr>
<tr align="center">
<td bgcolor="#FFFF99">Apples</td>
<td bgcolor="#FFFF99">$15.00</td>
<td bgcolor="#FFFF99">$5.00</td>
<td bgcolor="#FFFF99">$0.75</td>
</tr>
<tr align="center"><font color="white">
<td bgcolor="#FFFF99">Oranges</td>
<td bgcolor="#FFFF99">$20.00</td>
<td bgcolor="#FFFF99">$7.00</td>
<td bgcolor="#FFFF99">$1</td>
</tr>
</table>
</body>
</html>
```

Here is how the above html is actually displayed (not how it should be displayed):

<table>
<thead>
<tr>
<th>Costs in various packaging</th>
<th>Cost per Carton</th>
<th>Cost per bag</th>
<th>Cost per Individual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apples</td>
<td>$15.00</td>
<td>$5.00</td>
<td>$0.75</td>
</tr>
<tr>
<td>Oranges</td>
<td>$20.00</td>
<td>$7.00</td>
<td></td>
</tr>
</tbody>
</table>
Section 2. Questions related to computing and the Internet.

1. Match the following machines with their creators/designers/proposers. **Hint: each inventor is associated with one and only one machine. In some cases you may be able to determine an inventor by the name of the machine and/or you may be able to determine some matches by a process of elimination.**

<table>
<thead>
<tr>
<th>Inventor</th>
<th>Machine</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Charles Babbage</td>
<td>A Alto</td>
</tr>
<tr>
<td>2 Howard Aiken</td>
<td>B Apple I</td>
</tr>
<tr>
<td>3 J. Presper Eckert &amp; John Mauchly</td>
<td>C Atanasoff–Berry Computer</td>
</tr>
<tr>
<td>4 Konrad Zuse</td>
<td>D Colossus</td>
</tr>
<tr>
<td>5 Alan Turing</td>
<td>E Difference Engine</td>
</tr>
<tr>
<td>6 John V. Atanasoff</td>
<td>F ENIAC</td>
</tr>
<tr>
<td>7 Vannevar Bush</td>
<td>G Harvard Mark I</td>
</tr>
<tr>
<td>8 Steve Jobs &amp; Steve Wozniak</td>
<td>H Intel 8088 PC</td>
</tr>
<tr>
<td>9 IBM</td>
<td>I Memex</td>
</tr>
<tr>
<td>10 Xerox PARC</td>
<td>J Z1</td>
</tr>
</tbody>
</table>

[1 point each]

2. Match the following systems/terms with their creators/designers/proposers. **Hint: each innovator is associated with one and only one innovation. In some cases you may be able to determine an innovator by the name of the innovation and/or may be able to determine some matches by a process of elimination.**

<table>
<thead>
<tr>
<th>Innovator</th>
<th>Innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Robert Metcalfe</td>
<td>A “cyberspace”</td>
</tr>
<tr>
<td>2 Robert Kahn and Vincent Cerf</td>
<td>B email programs</td>
</tr>
<tr>
<td>3 Paul Baran</td>
<td>C ethernet</td>
</tr>
<tr>
<td>4 Bill Gates &amp; Paul Allan</td>
<td>D Mosaic Browser</td>
</tr>
<tr>
<td>5 Dennis Ritchie &amp; Ken Thompson</td>
<td>E MS-DOS</td>
</tr>
<tr>
<td>6 Tim Berners Lee</td>
<td>F packet-switching</td>
</tr>
<tr>
<td>7 Mark Andreessen</td>
<td>G RSA encryption</td>
</tr>
<tr>
<td>8 William Gibson</td>
<td>H TCP/IP</td>
</tr>
<tr>
<td>9 Ron Rivest, Adi Shamir &amp; Len Adelman</td>
<td>I Unix</td>
</tr>
<tr>
<td>10 Ray Tomlinson</td>
<td>J Web</td>
</tr>
</tbody>
</table>

[1 point each]

3. What is the “stored program concept”? [3 points]

4. How many 5MB MP3-encoded “songs” can be stored on a 10GB MP3 player? [5 points]
5. Convert 100110011₂ to:
   a. base-10 (decimal) [2 points]
   1* 2⁸ + 0* 2⁷ + 0* 2⁶ + 1* 2⁵ + 0* 2⁴ + 0* 2³ + 1* 2² + 1* 2¹ + 1* 2⁰
   = 256 + 32 + 16 + 2 + 1 = 307₁₀
   b. base-8 (octal) [1 point]
   1

6. If Moore’s Law says that complexity doubles every two years, how much will complexity increase in ten years? [3 points]

7. Consider the RGB code (204, 255, 51)
   a. Convert it to hexadecimal notation. [2 points]
   204/16 = 12₁₂ = CC, 255/16 = 15₁₂ = FF, 51/16 = 3₁₂ = 33
   —> CCFF33
   b. What color would this represent? [1 point]
   Saturated Red & Green = Yellow

8. How many bits can be stored on a 1GB Flash Drive? [3 points]

9. Order the following memory types by speed (1= fastest, 6 = slowest): [1/2 point each]

<table>
<thead>
<tr>
<th>Memory type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1 (L1) cache</td>
</tr>
<tr>
<td>Flash Drive</td>
</tr>
<tr>
<td>Level 2 (L2) cache</td>
</tr>
<tr>
<td>Hard Disk</td>
</tr>
<tr>
<td>DRAM</td>
</tr>
<tr>
<td>Processor registers</td>
</tr>
</tbody>
</table>

10. What is the primary distinction in using the term Internet and internet? [3 points]

11. Consider the DNS address ripples.cs.umass.edu
    a. How is it translated into an IP address? [1 point]
    
    b. Can an IP address have more than one DNS address? Explain? [2 points]

12. Why are DSL or Cable modems preferable to POTS (“plain old telephone service”) for Internet Access? Explain. [3 points]
Exam 1
Fall 2009
For questions 1-7 [worth 4 pts each], assume you created a file named "example.html" that includes the following html code (I have included line numbers for reference) and displays as shown below:

```
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd">
<html>
<head>
<title>An Example File for Exam 1 Fall 2009</title>
</head>
<body>
<p>This is an excellent example of a website.<br>
My first exam in CMPSCI 120 is being held in Herter Hall
</p>
<p>To prepare for this exam, I did the following:
<ul>
<li>studied the class notes
<li>took the W3C html exam
<li>got a good night's sleep
</ul>
</p>
</body>
</html>
```
9. Modify line 10 and add additional html “code” that inserts the image located at the URL: http://www-edlab.cs.umass.edu/cs120/Images/Herter.png scaled to 200x300 (height x width) pixels, so that the following is displayed: (Provide the html fragment below for the new line 10 and additional lines below) [5 pts]:

```
<body>
<p>This is an excellent example of a website. My first exam in CMPSCI 120 is being held in Herter Hall as shown below:
</p>
<img src="http://www-edlab.cs.umass.edu/cs120/Images/Herter.png" height="200" width="300"/>
</body>
```

10. Suppose you had a legal copy of the image in the directory ~yourname/public_html/Images/Herter.png, how would you modify your answer in 1 above to use relative addressing for the image.

```
<body>
<p>This is an excellent example of a website. My first exam in CMPSCI 120 is being held in Herter Hall as shown below:
</p>
<img src="Images/Herter.png" height="200" width="300"/>
</body>
```
11. Where your directory on the Ed Lab server would you put this file (named example.html) to ensure that it be rendered by a browser?

In ~myname/public_html

12. What URL would you enter in the browser to display this webpage? Please label the protocol, the host address, and the username in the above URL

http://www-edlab/~myname/example.html

13. Modify line 16 to link the words “W3C html exam” to the URL http://www.w3schools.com/html/html_quiz.asp, so that the following is displayed and W3C html exam is a link to the URL as shown:

To prepare for this exam, I did the following:

- studied the class notes
- took the W3C html exam
- got a good night's sleep

14. Provide an html fragment that changes the unordered list to an ordered list and adds a unordered sub-list of one item under item 2 (“took the W3C html exam”), where this item is “I got an 85 the first try”.

To prepare for this exam, I did the following:

1. studied the class notes
2. took the W3C html exam
   - I got an 85 the first try
3. got a good night's sleep
15. Provide an html fragment that *adds emphasis* to the words “excellent example” in line 9, so that the following is displayed:

This is an *excellent example* of a website.

Multiple choice questions 8-14 are worth **3 pts each**. *Circle the correct answer.*

16. Violating the University of Massachusetts AUP (Associated Use Policy) can result in withdrawal of your Internet access privilege and, perhaps, arrest.

   a. true
   b. false

17. How can you create an e-mail link in HTML?

   a. `<mail>xxx@yyy</mail>`
   b. `<a href="xxx@yyy">`
   c. `<mail href="xxx@yyy">`
   d. `<a href="mailto:xxx@yyy">`

18. If you receive an email from an UMass system administrator asking you to choose a new password and return it by email, you should do so immediately.

   a. true
   b. false

19. Choose the correct HTML tag for the largest heading

   a. `<h1>`
   b. `<heading>`
   c. `<h6>`
   d. `<head=1>`

20. How many 5MB MP3-encoded “songs” can be stored on a 16GB MP3 player?

   a. 80 songs
   b. 320 songs
   c. 3200 songs
21. Choose the correct HTML to left-align the content inside a table cell

   22. `<td left>`
   23. `<td leftalign>`
   24. `<td align="left">`
   25. `<td valign="left">`

26. If Moore’s Law says that speed doubles every three years, how much will speed increase in fifteen years?

   a. 64 times
   b. 32 times
   c. 5 times

Except where noted, the following short answer questions (15-20) are worth 4 pts each.

13. What is the “stored program concept”?

14. Convert $110101111_2$ to [4 points each]:
   a. base-10 (decimal)
   b. base-8 (octal)
   c. base-16 (hexadecimal)

15. Order the following memory types by speed (1 = fastest, 6 = slowest) [5 pts]:

<table>
<thead>
<tr>
<th>Order</th>
<th>Memory type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Processor registers</td>
</tr>
<tr>
<td>2</td>
<td>Level 1 (L1) cache</td>
</tr>
<tr>
<td>3</td>
<td>Hard Disk</td>
</tr>
<tr>
<td>4</td>
<td>Level 2 (L2) cache</td>
</tr>
<tr>
<td>5</td>
<td>DRAM</td>
</tr>
</tbody>
</table>

16. What is the primary distinction in using the term Internet and internet?
17. Consider the DNS address ripples.cs.umass.edu [4 points each]
   a. How is it translated into an IP address?

   b. Can an IP address have more than one DNS address? Explain?

18. Why are DSL or Cable modems preferable to POTS (“plain old telephone service”) for Internet Access? Explain.

19. I want to display the following table and wrote the html on the following page. Please correct it. Note that the image (“RaosLogo.jpg”) is located in ~yourname/public_html/Images and should be scaled 120x80 (wxh) pixels [14 pts].

<table>
<thead>
<tr>
<th></th>
<th>Direct from Raos</th>
<th>Whole Foods</th>
<th>CMPSCI Coffee Coop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guatemalan Antigua</td>
<td>$11.50</td>
<td>$13.00</td>
<td>$7.00</td>
</tr>
<tr>
<td>Tanzanian Peaberry</td>
<td>$15.75</td>
<td>$16.00</td>
<td>$7.00</td>
</tr>
<tr>
<td>Sumatra</td>
<td>$11.25</td>
<td>$13.00</td>
<td>$7.00</td>
</tr>
</tbody>
</table>

Here is how the html on the next page is actually displayed (not how it should be displayed):
<table>
<thead>
<tr>
<th></th>
<th>Cost per pound through various sources</th>
<th>Direct from Raos</th>
<th>Whole Foods</th>
<th>CMPSCI Coffee Coop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guatemalan Antigua</td>
<td>$11.50</td>
<td>$13.00</td>
<td>$7.00</td>
<td></td>
</tr>
<tr>
<td>Tanzanian Peaberry</td>
<td>$15.75</td>
<td>$16.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sumatra</td>
<td>$11.25</td>
<td>$13.00</td>
<td>$7.00</td>
<td></td>
</tr>
</tbody>
</table>
**HTML for question 20:**

```html
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN" "http://www.w3.org/TR/html4/loose.dtd">
<html>
<head>
<title>Exam 1 Example - Table</title>
</head>
<body>
<table border="10" cellspacing="0" cellpadding="10">
<tr align="left">
<th bgcolor="#FFFFFF" rowspan ="3">
<img href="Images/RaosLogo.png" width="50" Height="100"></th>
<th bgcolor="#AAAAAA" colspan ="3">Cost per pound through various sources</th>
</tr>
<tr align="center">
<td bgcolor="#DDDDDD">Guatemalan Antigua</td>
<td bgcolor="#DDDDDD">$11.50</td>
<td bgcolor="#DDDDDD">$13.00</td>
<td bgcolor="#DDDDDD">$7.00</td>
</tr>
<tr align="center">
<td bgcolor="#DDDDDD">Tanzanian Peaberry</td>
<td bgcolor="#DDDDDD">$15.75</td>
<td bgcolor="#FFFFFF">$16.00</td>
</tr>
<tr align="center">
<td bgcolor="#BBBBBB">Sumatra</td>
<td bgcolor="#DDDDDD">$11.25</td>
<td bgcolor="#DDDDDD">$13.00</td>
<td bgcolor="#DDDDDD">$7.00</td>
</tr>
</table>
</body>
</html>
```
Additional space for answers, if you need it. Please clearly with the question number, e.g. #6
<table>
<thead>
<tr>
<th></th>
<th>Direct from Raos</th>
<th>Whole Foods</th>
<th>CMPSCI Coffee Coop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guatemalan Antigua</td>
<td>$11.25</td>
<td>$13.00</td>
<td>$7.00</td>
</tr>
<tr>
<td>Tanzanian Peaberry</td>
<td>$15.75</td>
<td>$16.00</td>
<td>$7.00</td>
</tr>
<tr>
<td>Sumatra</td>
<td>$11.25</td>
<td>$13.00</td>
<td>$7.00</td>
</tr>
</tbody>
</table>