Section 1: COMPUTER LITERACY

Question 1

Answer: _____

In the Von Neumann machine, what does ALU stand for?

(A) Addition Logical Unit
(B) Arithmetic Logic Unit
(C) Arithmetic Language Unit
(D) Absolute Link Unit

Question 2

Answer: _____

Which of the following is not part of the Microsoft Office Suite?

(A) Access
(B) Word
(C) Excel
(D) Photoshop

Question 3

Answer: _____

From what company does the software application, Photoshop, originate?

(A) Microsoft
(B) Adobe
(C) Macromedia
(D) Sun

Question 4

Answer: _____

Which programming language was introduced first?

(A) Pascal
(B) Java
(C) COBOL
(D) PHP
Question 5

Answer: _____

What inventor of the analytic engine is oftentimes dubbed the “father of computer science?”

(A) Blaise Pascal  
(B) Bill gates  
(C) Euclid  
(D) Charles Babbage

Section 2: BOOLEAN ALGEBRA AND LOGIC

BOOLEAN ALGEBRA

Boolean values: true, false.

A true value is denoted with 1 while a false value is denoted with 0. Thus, a Boolean variable can have one of two values: 1 (true) or 0 (false).

Operations that can be performed on two Boolean variables:

AND: If both values are true, the result is true. Otherwise, the result is false.
OR: If either or both values are true, the result is true. Otherwise, the result is false.
XOR: If only one of the two values is true, the result is true. Otherwise, the result is false.

The following series of tables illustrate the results of AND, OR, and XOR Boolean operations.

<table>
<thead>
<tr>
<th>AND</th>
<th>TRUE</th>
<th>FALSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRUE</td>
<td>TRUE</td>
<td>FALSE</td>
</tr>
<tr>
<td>FALSE</td>
<td>FALSE</td>
<td>FALSE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OR</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRUE</td>
<td>TRUE</td>
<td>TRUE</td>
</tr>
<tr>
<td>FALSE</td>
<td>TRUE</td>
<td>FALSE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>XOR</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRUE</td>
<td>FALSE</td>
<td>TRUE</td>
</tr>
<tr>
<td>FALSE</td>
<td>TRUE</td>
<td>FALSE</td>
</tr>
</tbody>
</table>

Examples: 1 AND 0 = 0  1 OR 0 = 1  1 XOR 1 = 0

The AND operation on two Boolean variables, A and B, is denoted AB, A*B, or A · B.
The OR operation on two Boolean variables, A and B, is denoted $A+B$.

The XOR operation on two Boolean variables, A and B, is denoted $A \oplus B$.

Examples: Let $A = 0$, and let $B = 1$.

$AB = A*B = A \land B = 0$  $A+B = 1$  $A \oplus B = 1$

The complement of A is denoted $A'$ or $\overline{A}$. If $A = 0$, $A' = 1$. If $A = 1$, $A' = 0$.

When evaluating Boolean expressions, the order of precedence is as follows:

1. Parentheses
2. Complement
3. $\land$, $\lor$, and $\oplus$ (from left to right)

BIT STRING OPERATIONS

BITWISE operations are performed on bit strings. To execute BITWISE operations on two bit strings, perform the operation on the rightmost bits in the pair of strings, then the second rightmost bits, and so on.

For example, to execute a BITWISE OR on bit strings 1001 and 1100 to yield the result of 1001, execute the following steps:

Step 1:

<table>
<thead>
<tr>
<th>1001</th>
<th>1 OR 0 = 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>BITWISE OR</td>
<td>1100</td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

Step 2:

<table>
<thead>
<tr>
<th>1001</th>
<th>0 OR 0 = 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>BITWISE OR</td>
<td>1100</td>
</tr>
<tr>
<td></td>
<td>01</td>
</tr>
</tbody>
</table>

Step 3:

<table>
<thead>
<tr>
<th>1001</th>
<th>0 OR 1 = 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>BITWISE OR</td>
<td>1100</td>
</tr>
<tr>
<td></td>
<td>001</td>
</tr>
</tbody>
</table>

Step 3:

<table>
<thead>
<tr>
<th>1001</th>
<th>1 OR 1 = 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>BITWISE OR</td>
<td>1100</td>
</tr>
<tr>
<td></td>
<td>1001</td>
</tr>
</tbody>
</table>

When bit strings vary in size, add leading 0s to the shorter string.
Circuit Logic

Circuits consist of gates, and each gate executes a specific Boolean operation on Boolean input values to yield a Boolean output value.

**Question 6**

Answer: _____

Let A be the bitstring 11001, let B be the bitstring 001, and let C be the bitstring 11100. Let D be the result of a BITWISE OR operation on A and B. What is the result of the BITWISE AND operation on D and C?

(A) 10000  
(B) 11000  
(C) 11100  
(D) 11110

**Question 7**

Answer: _____
Bob weighs 200 lbs. Sue weighs 150 lbs. If Ellen weighs more than 250 lbs, then Rick weighs the sum of 1/10 of Bob’s weight and 1/2 of Sue’s weight. If Ellen weighs exactly 250 lbs, Rick weighs thirty times as much as Bob’s weight after it has been divided once by Sue’s weight. Otherwise, Rick weighs ½ of Bob’s weight. If Ellen weighs five-fourths of Bob’s weight, what is Rick’s weight?

(A) 40 lbs.
(B) 95 lbs.
(C) 100 lbs.
(D) 160 lbs.

**Question 8**

Answer: ______

If \( A = 1, B = A, C = D = 0, E = (AB)' + (C*D), F = (E \oplus A)' \), what are the values of \( E \) and \( F \)?

(A) \( E=0, F=0 \)
(B) \( E=0, F=1 \)
(C) \( E=1, F=0 \)
(D) \( E=1, F=1 \)

**Question 9**

Answer: ______

What are the values of \( A \) and \( B \) in the following circuit?

(A) \( A=0, B=0 \)
(B) \( A=0, B=1 \)
(C) \( A=1, B=0 \)
(D) \( A=1, B=1 \)
**Question 10**

Answer: _____

If A is 111, B is 1110, and C is 1010, what is the result of $(AB) \oplus C$?

(A) 0100  
(B) 0110  
(C) 1100  
(D) 1110

**Section 3: HARDWARE & SOFTWARE**

**Question 11**

Answer: _____

If $2^{10}$ bytes are in a Megabyte, how many bits are in a Megabyte?

(A) 8*512  
(B) $2^{13}$  
(C) 8*(1.44)  
(D) 1024 + 3

**Question 12**

Answer: _____

What does DVD stand for?

(A) Digital Video Disc  
(B) Digital Von Neumann Disc  
(C) Digital Versatile Disc  
(D) Digital Virtual Disc

**Question 13**

Answer: _____

Which came first?

(A) Apple II Computer  
(B) Compact Disk  
(C) Laser Printer  
(D) Mouse
Question 14

Answer: _____

What is RAM?

(A) Read Access Machine
(B) Random Access Machine
(C) Read Access Memory
(D) Random Access Memory

Question 15

Answer: _____

Which screen resolution produces a larger image in the eyes of the user?

(A) 800 by 600 pixels
(B) 1024 by 768 pixels
(C) 1152 by 864 pixels
(D) 1280 by 1024 pixels
Section 4: PROGRAMMING CONSTRUCTS

Question 16

Answer: _____

After executing the following code, what is the value of x?

(A) 2
(B) 4
(C) 6
(D) 8

x = 6;
y = 7;

if (y > x)
    x = x + 2;
else
    y = x – 1;
if (y > x)
    x = x + 2;
else
    x = x – 2;

Question 17

Answer: _____

After executing the following code, what is the value of y?

(A) 1
(B) 3
(C) 5
(D) 7

y = 2;
for (int x = 0; x < 3; x++)
{
    if (y < 3)
    {
        y = y – 1;
    }
    y = y + 2;
}
**Question 18**

Answer: _____

If the variables x, y, and z are listed from largest to smallest according to value, in what order would they be listed after executing the following code?

- (A) y, x, z
- (B) z, x, y
- (C) x, y, z
- (D) x, z, y

x = 15;
y = 50;
z = 5;

for (int c = 1; c < 3; c++)
{
    x = x + (y/z);
    z = c * z;
    y = y + 5;
}

**Question 19**

Answer: _____

What is the value of z after executing the following code?

- (A) 10
- (B) 12
- (C) 16
- (D) 18

z = 0;
for (int x = 1; x < 5; x++)
    for (int y = x + 1; y < (2 * x); y++)
        z = z + y - x;
Question 20

Answer: _____

After executing the following code, what is the correct order of the values of the variables if sorted from smallest to largest?

- (A) x, y, z
- (B) x, z, y
- (C) y, x, z
- (D) y, z, x

\[
x = 2; \quad y = 3; \quad z = 4;
\]

if (y < 10)
{
    if (x < 3)
    {
        y = y + 2;
        x = x - 1;
    }
}
else
{
    if (y > 2)
    {
        x = x + 1;
        if (x > -2)
        {
            y = y - 2;
        }
    }
    else if (x < -2)
    {
        y = y - 1;
    }
    else
    {
        x = x + 5;
    }
    z = z * 2;
}
Section 5: INTRANET/HTML

**Question 21**

Answer: _____

In the URL www.armstrong.edu, “edu” stands for education. In the URL www.google.com, what does com stand for?

(A) Commerce  
(B) Commercial  
(C) Community  
(D) Company

**Question 22**

Answer: _____

Which opening HTML tag has an associated closing tag?

(A) <BR> (line break)  
(B) <HR> (horizontal rule)  
(C) <IMG> (image)  
(D) <LI> (list item)

**Question 23**

Answer: _____

Which of the following pairs of image file types and extensions is incorrect?

(A) BMP: Binary Microsoft Photograph  
(B) GIF: Graphics Interchange Format  
(C) JPEG: Joint Photographic Experts Group  
(D) PNG: Portable Network Graphics

**Question 24**

Answer: _____

What is the correct HTML code segment for inserting a hyperlink to www.google.com in the html file of a Web page?

(A) <A HREF=www.google>Link to Google</HREF>  
(B) <A HREF="www.google.com">Link to Google</HREF>  
(C) <A="www.google.com">Link to Google</A>
Question 25

Answer: _____

Which of the following is a browser?

(A) Google
(B) NetSearch
(C) Mozilla
(D) Lycos