

1. (12 points; 3 points each) Define the following terms:

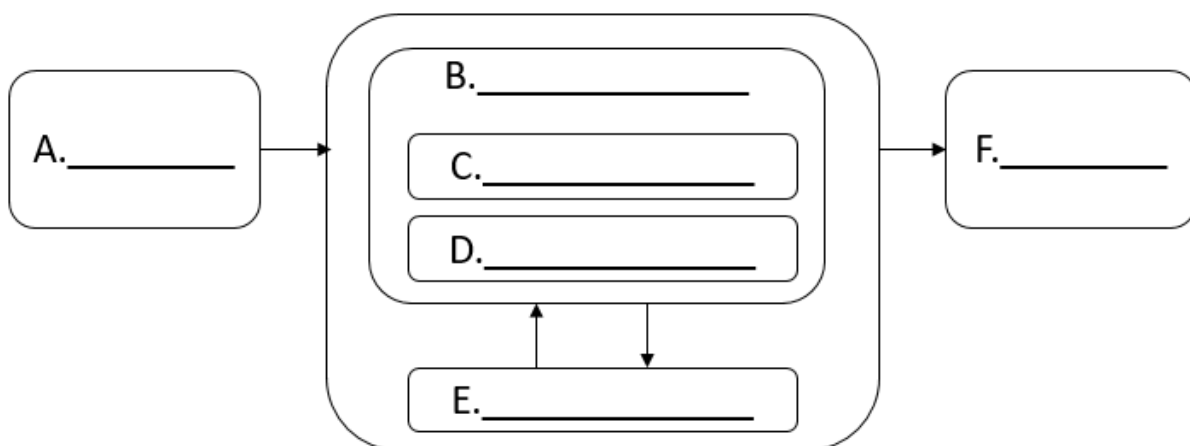
a. Computer

b. Computer Science

c. Programming Language

d. Algorithm

2. (6 points) Label the units/devices in the diagram for the von Neumann architecture given below:



3. In the first column write the century or year to the corresponding value in Column B. Then match the answers in Column C to the correct value in Column B. See example in grey.

(1 point each; 22 points total)

<u>Century or Year</u>	<u>Column B</u>
1971-1980	L 4 th Generation Hardware
_____	_____ Joseph Jacquard
_____	_____ Univac I
_____	_____ Charles Babbage
_____	_____ Herman Hollerith
_____	_____ 2 nd Generation Software
_____	_____ Leibniz Machine
_____	_____ Ada Lovelace
_____	_____ Alan Turing
_____	_____ Harvard Mark I
_____	_____ 1 st Generation Hardware
_____	_____ Abacus

Column C

- A. First computer used to predict outcome of a presidential election
- B. Transistor
- C. Developed concept of a loop
- D. Inventor of loom that used a series of punched cards
- E. Revolutionized the census
- F. Calculating Machine that included multiplication and division
- G. British Mathematician that developed a test for AI
- H. Analytical Machine
- I. Instrument to record numeric values and on which a human can perform basic arithmetic
- J. High Level Languages
- K. IBM automatic sequence controlled calculator given to Harvard
- L. Large Scale Integration

4. (5 points) Draw a control flow diagram of a loop.

For the following short-answer questions, check your work carefully, since no partial credit can be given. Note that "output" means what will be printed on the display screen.

5. (10 points) Given the following code fragment, state clearly and precisely what the output will be:

```
int j = 6;
int k = 2;
k = j;
System.out.println(j + " and " + k);
```

6. (10 points) Given the following code fragment, state clearly and precisely what the output will be:

```
int b = 12;
System.out.println("First " + --b);
System.out.println("Then " + b);
```

7. (10 points) Given the following code fragment, state clearly and precisely what the output will be:

```
int a = 5;
System.out.println("First " + a++);
System.out.println("Then " + a);
```

8. (5 points) Write the following Java statement using a compound operator:
`gradeTotal = gradeTotal + labTotal;`

9. (5 points) For the following identifiers, which are legal and which are not?
- | | |
|------------------|---------------|
| a. \$total | d. student Id |
| b. 1sum | e. account# |
| c. employee_Name | |

10. (10 points) Below, within the given program "shell," and write the code fragment that asks the user for an integer number. Get the number as input. Then, if the number is negative, print the message "Your number is negative." Otherwise, print the message, "Your number is nonnegative."

```
public class PosOrNeg {  
    public static void main(String[] args) {  
        Scanner input = new Scanner(System.in);  
  
        // code your variable declarations and logic below:
```

```
    }  
}
```

11. (5 points) What would you name the file (include the extension) of the above program?

Bonus

1. (5 points) What country just granted citizenship to a robot for the first time?

2. (5 points) What is the output of the following program?

```
4 import java.util.Scanner;
5
6 public class NestedWhileLoop {
7     public static void main(String[] args) {
8
9         Scanner input = new Scanner(System.in);
10
11         int outerLoop = 1;
12
13         while(outerLoop < 4){
14
15             int innerLoop = 3;
16
17             while(innerLoop < 6){
18                 System.out.println(outerLoop + " : " + innerLoop);
19                 innerLoop++;
20             }
21
22             outerLoop++;
23         }
24
25     }
26 }
```