Name,Surname:.....:..... Signature..... Student. Nr: .....

CMPE108, Homework-1 (H/W-S/W and Algorithms/Flowcharts.) Please write your number on every page.

Please fill the answers by **pen** or **pencil**. Late submissions, printout solutions, and photocopies will not be graded.

Q1 Find the best choice among A, B, C, or D as the answer of each question. Write your answer in the answer box provided.

a. Which of the following properties does not belong to C? [ ]
A) It is a high-level programming language.
B) It is a small programming language.
C) It is an efficient programming language.
D) It has standard libraries.

b. What is the correct order of memory unit magnitudes?
TB=Terabyte, GB=Gigabyte, MB=Megabyte, and KB=Kilobyte [ ]
A) KB < GB < MB < TB
B) KB < MB < TB < GB
C) KB < MB < GB < TB
D) MB < KB < GB < TB

c. The main circuit board in system unit is called ... ? [ ]
A) CPU B) Graphic Card
C) Motherboard D) Hard-drive

d. Central Processor Unit (CPU) is composed of two components: ..... and …… [ ]
A) input and output
B) primary and secondary storage
C) ALU and CU
D) none of the choices

e. Each of ASCII, ANSI, and Unicode standards is based on how many bits respectively? [ ]
A) 8, 7, and 16 B) 7, 8, and 16
C) 7, 16, and 8 D) 16, 7, and 8

f. Which of the following components is connected to the motherboard? [ ]
A) Processor B) Memory Chips
C) Expansion boards D) All of the choices

g. Choose which set of operations are the task of Control Unit [ ]
1. Reads and interprets instructions
2. Performs computations
3. Performs logical operations (comparisons)
4. Directs the operation of internal processor components
5. Controls the flow of programs and data in and out of RAM
6. Stores the machine code instructions
A) 1,2, and 3 B) 4, 5, and 6
C) 1, 3, and 6 D) 1, 4, and 5

h. Which of the following is NOT a kind of memory? [ ]
A) RAM B) Register
C) Cache D) BUS

i. Which of the choices is one of the specifications of ROM? [ ]
A) It is volatile
B) Contains instructions that the user cannot change
C) It is inside CPU
D) Performs computations

j. Which of the following is NOT a programming language? [ ]
A) UNIX B) Java
C) Perl D) C#

Q2 Find the best choice among A, B, C, or D as the answer of each question. Write your answer in the answer box provided.

a. Physical components of computer system are named as ..... . [ ]
A) Hardware B) Software
C) Operating system D) Application programs

b. A set of instructions that tells the computer what to do is called ..... . [ ].
A) Databases B) Programs
C) Peripherals D) Input/Output devices

c. The term "bit" shortly stands for ..... . [ ].
A) Megabyte B) Binary language
C) Binary digit D) Binary number

d. The CPU consists of ..... . [ ]
A) an arithmetic logic unit and a front side bus
B) a control unit and an arithmetic logic unit
C) a control unit and a front side bus
D) a control unit and a cache memory

e. We may represent ..... by a single bit. [ ]
A) a logical value such as 0 or 1
B) a signed integer C) an ASCII character
D) a real number.

f. The programs and data that the computer is currently using are stored at ..... . [ ]
A) ROM B) CPU C) RAM
D) Hard Disk

g. The following algorithm finds product P of two numbers A and B. Find the choice that completes the missing line. [ ]

```
BEGIN
INPUT  A, B
ASSIGN P=0
WHILE B is nonzero,
    P = A + P
    .............
ENDWHILE
OUTPUT  P
END
```

A) assign B= A*B B) assign A=A*B
C) increment A by 1 D) Decrement B by 1

Q3 Find the best choice among A, B, C, or D as the answer of each question. Write your answer in the answer box provided.

a. Central Processor Unit (CPU) is composed of two components: ..... and …… [ ]
A) input and output B) primary and secondary storage
C) ALU and CU D) none of the choices

b. Which of the following components is connected to the motherboard? [ ]
A) Processor B) Memory Chips C) Expansion boards D) All of the choices

c. Which of the following is NOT a kind of memory? [ ]
A) RAM B) Register C) Cache D) BUS

d. Which of the choices is one of the specifications of ROM? [ ]
A) It is volatile B) Contains instructions that the user cannot change
C) It is inside CPU D) Performs computations

Q4 Fill in correct terms or choices.

i) What do we call the electronic and mechanical (physical) parts and components of a computer system?

_____.

ii) What are the four major functions of a computer?

_____

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iii) What is the numbering system used by computers to perform operations? _____

iv) ASCII stands for? _____
a) American National Standards Institute
b) American Standard Code for International Interchange
c) American Standard Code for Information Interchange
d) American National Standards Interface

v) A number is composed of 8 bytes. How many bits it is?

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vi) Determine which one of the following devices are INPUT or OUTPUT
a) Keyboard _____
b) Printers _____
c) Mouse _____
d) Smartphone Touchscreen _____
e) Earphones _____
f) Microphone _____
g) Scanner _____
h) Monitors _____

vii) What does CPU stand for? _____
a) Central Programmable Unit
b) Control Processing Utility
c) Central Processing Unit
d) Control Processing Unit

viii) Which item below is not directly connected to motherboard? _____
a) Memory Chipsets
b) ALU
c) Hard Disk Drive
d) CPU

ix) Which component of CPU performs operations such as adding two numbers? _____

x) RAM stands for:
a) Remarkable Attribute Model
b) Random Access Module
c) Random Access Memory
d) Read Only Memory

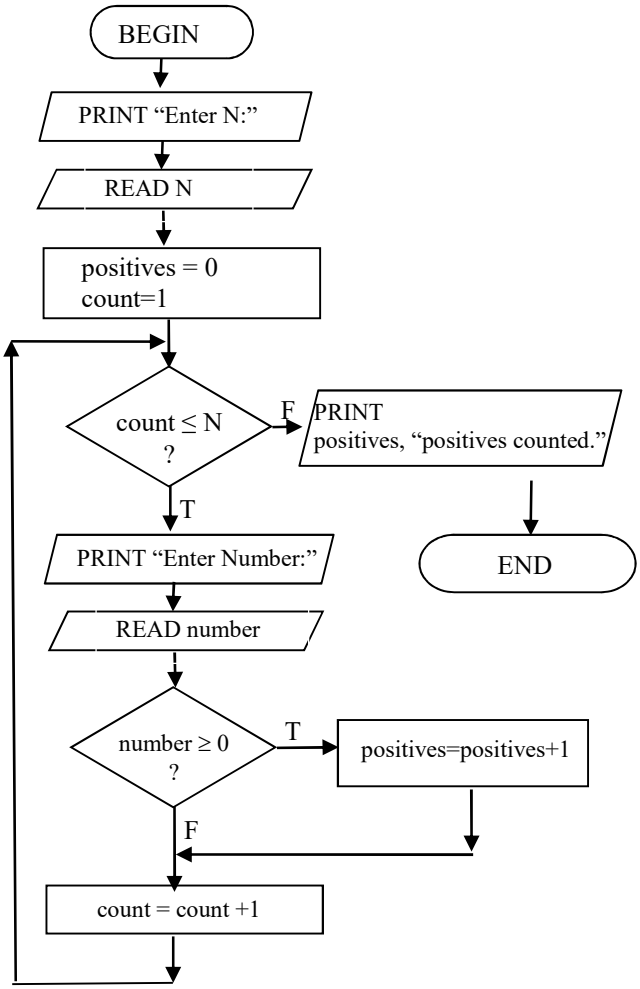
xi) Determine which one of the following memories are VOLATILE or NON-VOLATILE
a) PROM _____
b) Flash Memory _____
c) RAM _____
d) Hard Disk Drive _____
e) Cache Memory _____

xii) In terms of speed which of the following memories is the fastest? _____ ,

which one is the slowest?_____.
Cache, Register, RAM, ROM,
Hard Disk Drive, CD-ROM

xiii) In terms of speed which relation is correct ? _____
a) GHz is faster than KHz which is faster than MHz
b) KHz is faster than MHz which is faster than GHz
c) GHz is faster than MHz which is faster than KHz

Q5. Design an algorithm for the given flowchart. ALGORITHM



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b) Trace the flowchart for N=3 and numbers −1, 5, 4 .

N	positives	count	number	number>=0	count <= N

Q6 Consider the following flowchart, where The function **abs(A)** represents the absoute value of A.

a) Write a algorithm of the flowchart by using a do-while structure.

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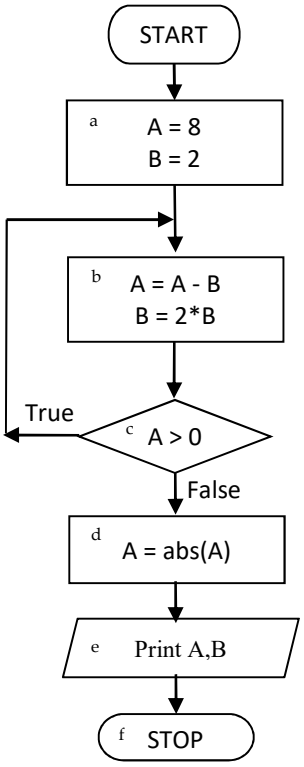
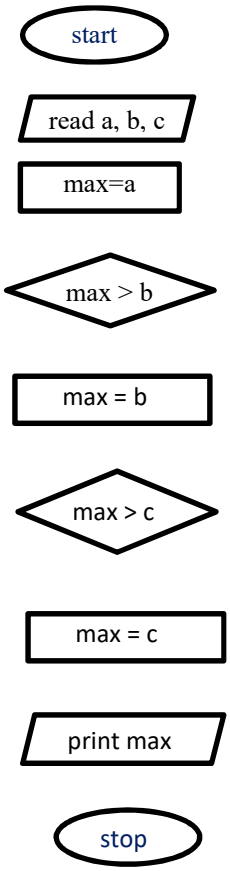


b) Trace the flowchart for input value **A=8 and B=2**.

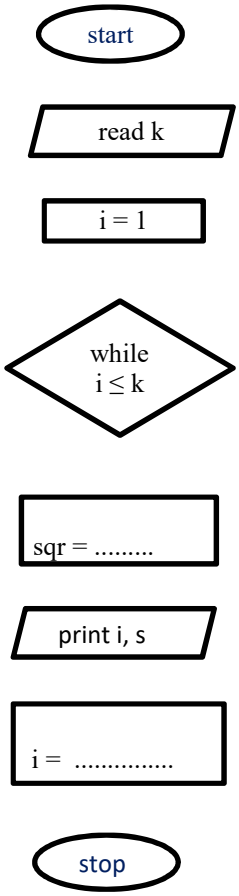
step	A	B	A>0
a	8	2	

Q7 Connect the following flow diagram correctly to solve the described problems. Please do not forget to mark "yes" and "no" of the decision box outlets.

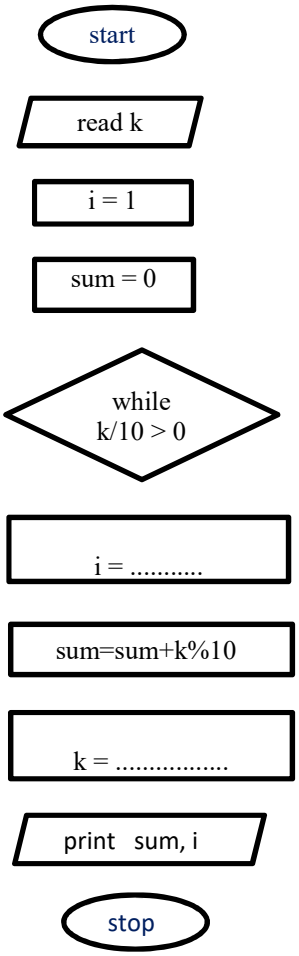
a) print maximum of a, b, c, printed with arrowed lines.



b) print the list of squares for the first k integers



c) print the sum of digits, and the count of digits of an integer number k.



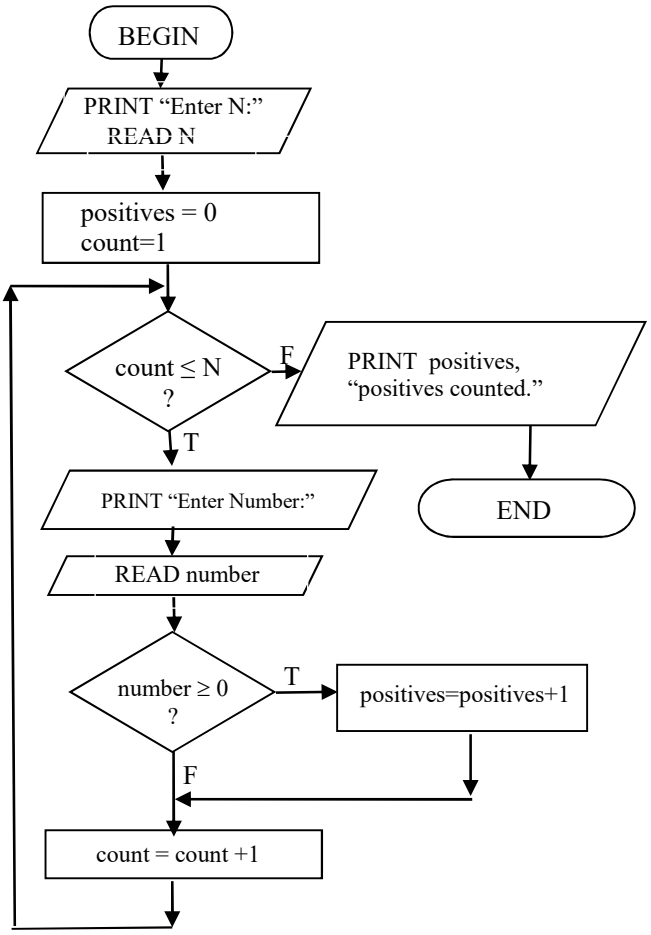
Q8 Write an ALGORITHM and draw a FLOWCHART for the following problem:

We want to compute and display the sum of 10 numbers.

- The numbers shall be entered one by one as input.
- Use a while loop in your algorithm and flowchart.
- Use only three variables: **X** for the entered number, **SUM** for the sum of entered numbers, and **COUNT** is to count the entered numbers and terminate the loop. Use the answer boxes for your answer.

Algorithm:	Flowchart:
....	

Q9 Design an algorithm for the given flowchart.



ALGORITHM

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b) Trace the flowchart for N=3 and numbers −1, 5, 4 .

N	positives	count	number	number>=0	count <= N

Q10. Euler's convergence improvement transformation provides a sum of series to calculate π/2 by:

$$\pi/2 = 1 + \frac{1}{3} + \frac{1\cdot 2}{3\cdot 5} + \frac{1\cdot 2\cdot 3}{3\cdot 5\cdot 7} + \frac{1\cdot 2\cdot 3\cdot 4}{3\cdot 5\cdot 7\cdot 9} + \ldots$$

Using the variables

i: for counting terms;

t: for the value of the term;

s: for the summation of the terms,

p: for the π number

write an algorithm that calculates an approximated value of π by the sum of the first 50 terms.

Q11. Gregory-Leibniz formula provides a sum of series to calculate π/4 by:

$$\pi/4 = + \frac{1}{1} - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \frac{1}{11} + \ldots$$

Using the variables

i: for counting terms;

t: for the value of the term;

s: for the summation of the terms,

p: for the π number

write an algorithm that calculates an approximated value of π by the sum of the first 50 terms.