Q1 Academic Honesty

1 Point

It is a violation of the Academic Integrity Code to look at any reference material other than your textbook and lecture notes, or to give inappropriate help to someone or to receive unauthorized aid by someone in person or electronically via messaging apps such as WhatsApp. Academic Integrity is expected of all students of Hacettepe University at all times, whether in the presence or absence of members of the faculty. Do NOT sign nor take this exam if you do not agree with the honor code.

Understanding this, I declare I shall not give, use or receive unauthorized aid in this examination.

Signature (Specify your name and surname as your signature)

Mehmet Taha USTA MTUSTA

_While answering the following questions, please consider the implementations that we discussed in our lectures unless stated otherwise.

Q2 Brick game machine

1 Point

In the following, you see an image of a brick game machine which was very popular in the 90s.

This handheld game console was specially designed to run different variants of the original Tetris game which dates back to

1984-1985 and which was developed in the former Soviet Union by the Russian programmer Alexey Pazhitnov. The players have the ability the control the flow of the game by using the buttons placed on the machine.

Considering the computational capabilities, which one of the following computers is more similar to this brick game machine?

- ○ Colossus Mark 1
- ○ Difference Engine
- ○ Analytical Engine
- ◉ ENIAC

Q3 HMMM programming

1 Point

Consider the HMMM program given below:

```
1  00 read   r1
2  01 setn   r2 2
3  02 setn   r3 1
4  03 mul    r3 r3 r2
5  04 sub    r4 r3 r1
6  05 jgtzn  r4 09
7  06 jumpn  03
8  07 nop
9  08 nop
10 09 write  r3
11 10 halt
```

Suppose the user enters 18 as an input. What will be the content of r3 (in decimal form) after the instruction at 04 is executed four times.

- ◉ 2
- ○ 4
- ○ 8
- ○ 16

Note: While answering this question, you can refer to the HMMM documentation: https://www.cs.hmc.edu/~cs5grad/cs5/hmmm/documentation/documentation.h

Q4 Code tables

0 Points

The multiple choices provided below do not include the correct answer, hence this question is not graded.

Assume your computer is using ASCII codes to represent characters (letters, digits, etc.). Further assume that you wrote a program to sort strings in descending order. What would be the output of such a program, if you wanted to sort the list below?

abc, Abc, ABC, abC, 1abc, Abc1

- ○ abc, abC, Abc, Abc1, ABC, 1abc
- ○ 1abc, ABC, Abc1, Abc, abC, abc
- ◉ 1abc, ABC, Abc, Abc1, abC, abc
- ○ 1abc, ABC, Abc, Abc1, abc, abC

Q5 Instruction encoding

1 Point

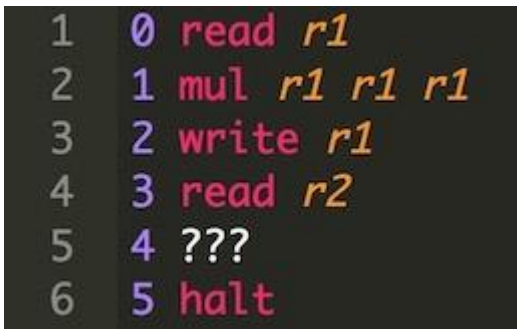
Assume you have a 10-bit computer, which contains 14 commands in it's instruction set. An instruction is encoded as an opcode to represent the instruction, a destination register to store the result, and two further registers containing operands. What is the maximum number of registers that you can have on this computer?

- ○ 2
- ○ 4
- ○ 8
- ◉ 16

Q6 HMMM programming

1 Point

Consider the HMMM program given below:



The program is supposed accept a number from its user, compute its square, and print the result. Then, it asks the user for another number. If this number is different than zero, the execution goes to the beginning of the code.

Complete the missing code shown by "???" in the program accordingly.

- ○ jeqzn r2 0
- ○ jeqzn r2 1
- ◉ jnezn r2 0
- ○ jnezn r2 1

Short Exam 1

● GRADED

STUDENT
MEHMET TAHA USTA

TOTAL POINTS
2 / 5 pts

QUESTION 1
Academic Honesty — **1** / 1 pt

QUESTION 2
Brick game machine — **0** / 1 pt

QUESTION 3

HMMM programming **0** / 1 pt

QUESTION 4

Code tables **0** / 0 pts

QUESTION 5

Instruction encoding **0** / 1 pt

QUESTION 6

HMMM programming **1** / 1 pt