Computer architectures

exam

(INBMA0212-21, INBMA0212-17)

'A' testsheet

Available time frame: 60 minutes.

What is the value of the short int type variable, which has the following memory content as a fixed-point big-endian byte sequence?

`00000001 00000011`

3 points

answer:

How many characters are encoded in the following bit sequence using UTF-8?

`11101001 10000001 10000101`

3 points

answer:

Which 1 byte long bit sequence represents the following decimal integer in case of unpacked BCD representation?

`8`

3 points

answer:

What is the value of the float type variable, which has the following memory content as a single precision floating point big-endian bit sequence?

`11111111 10000000 00000000 00000000`

3 points

answer:

What is the value of the q variable after the execution of the following C instruction?

```
float q, w=2.0/0.0;
q=0.0*w;
```

3 points

answer:

Are the following statements true?   *(30 points; +1, 0, -1 point per statement)*

Statements	Answers	
The CPU can directly execute an assembly instruction without any further transformation.	yes	no
The output of a multiplexer is independent of the previous state of the circuit.	yes	no
The address bus is used only during memory reading operation, while the data bus is used during both reading and writing.	yes	no
The value of the stack pointer register can change during execution of some intructions.	yes	no
Context saving is necessary during non-maskable instructions as well.	yes	no
The "dirty" cache lines must be frequently deleted from the cache, because they are stored in DRAM.	yes	no
In case of x86 architectures, if the content of the BL register change, it is affects the EBX registercontent as well.	yes	no
The superscalar processors use out of order execution.	yes	no
Dynamic linking cause large executable files because the generation of object code from assembly code happens in execution time.	yes	no
Further statement ...	yes	no
Further statement ...	yes	no
Further statement ...	yes	no
Further statement ...	yes	no
Further statement ...	yes	no
Further statement ...	yes	no
Further statement ...	yes	no
Further statement ...	yes	no
Further statement ...	yes	no
Further statement ...	yes	no
Further statement ...	yes	no
Further statement ...	yes	no
Further statement ...	yes	no
Further statement ...	yes	no
Further statement ...	yes	no

Further statement ...		yes	no
Further statement ...		yes	no
Further statement ...		yes	no
Further statement ...		yes	no
Further statement ...		yes	no
Further statement ...		yes	no

What do you know about the processors? (Role in computer, schematic structure, basic operation, fetch-execute cycle etc.)

15 points