Løsningsforslag digitalteknikk INF 2270 til uke 8 (19/2-23/2) 2007

Fra læreboka: Oppgave 1-7 på side 66.

Oppgave 1.
IP – Instruction Pointer. Holds the address of the next Instruction.
MBR – Memory Buffer Register. Temporarily holds data passing between the processor and the data bus.
MAR – Memory Address Register. Temporarily holds addresses being placed on the address bus by the processor.
Flag – Indicates the status of an arithmetic or logical operation performed by the Arithmetic and Logic Unit (ALU)
within the processor.

Oppgave 2.
[MAR] <- [IP]
[IP] <-[IP] + 1
[MBR] <- [M([MAR])]
[IR] <- [MBR]

Oppgave 3.
Z is the zero bit. It is set to 1 (or true) if the result of an operation is zero or if zero is loaded into a register.

Oppgave 4.
Changing the value in the IP register causes a change in the next instruction to be executed. A jump or branch instruction causes the value of the IP register to change to the address of the instruction to which the program jumps.

Oppgave 5.
PC stands for Program Counter. PC is a common alternative to IP, as explained in the text. In a 16-bit computer the instructions are 16 bits or two bytes long. If all the data was also two bytes long then the PC can address each 2-byte unit. This CPU can address individual bytes which means each address refers to a byte not a word (two byte unit). To move from one word (or instruction) to the next means an increment of two bytes.

Oppgave 6.
A machine code program is one that is in the binary code used by the specific CPU. This is difficult to read so an assembly language program uses mnemonics (textual code) to represent machine code. An assembler is used to translate the assembly code to machine code.

Oppgave 7.
There are many options here but an example would be 'load MBR from data bus' or 'place content of A on internal bus'.

Løsningsforslag til eksamensoppgaven finnes på http://www.ifi.uio.no/~inf103/Eksamener/Fasit-2001.pdf