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Cis 480
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1.

      The Bus carries information from the register, it can't take anything more than four bits so it is cap at 4 bit, the C bus on the other hand carries information from the ALU implying that some operation must have been done on the information does it has the potential of not being four bits.

2.)

First we

load J

then we load K

then add both terms

and store in i.

this is in total 4 *operations if one opertion takes* $4\,GHZ$ *then* 4 *opertions should take*

$$4 \times \frac{1}{4 \times 10^{9}} = 1 \times 10^{-9} sec = 1ns$$

3.)

Pop2 operation

      $SP = Sp - 1$ \\point to next on the stack

      $MAR = SP - 1; Rd$

      \\one clock circle to read

      $Tos = MDR:$ goto Main 1