

Study Questions and Answers

ISA level

1. Consider the instruction LOAD M(X), which transfers the contents of memory location X to the accumulator. Recall that instructions on this machine are 20 bits long: 8 bits for the opcode, and 12 bits for the operand. The opcode for the LOAD M(X) instruction consists of the 8 bits: 00000001.

What would the machine code instruction look like to load the contents of memory address 2?

2. Bellekte bir komutun kendisi 300. adresi ise 301. adrese konmuştur. Adres sahasının değeri 200 dür. Verilen adres modları için efektif adresi hesaplayınız. ([R1] = 400) (15)
 - a. direct
 - b. immediate
 - c. relative
 - d. register indirect
 - e. index (R1 index kayıtcı).
3. Bir bilgisayarın belleği 32 bitlik 256K kelimedenden oluşmaktadır. Komutlar bir bellek kelimesinde kodlanmıştır. Komut: işlem kodu, kayıtcı (64 kayıtcıdan birisini belirtecek şekilde) kodu ve adres kısmından oluşmaktadır (10)
 - a) Belleği data ve adres girişleri kaç bittir?
 - b) Komut formatını çizerek her saha için gerekli bit sayısını belirtiniz.
4. The performance ratio of the IBM 360 Model 75 is fifty times that of the 360 Model 30, yet the instruction cycle time is only five times as fast. How do you account for this discrepancy?
5. While browsing at Billy Bob's computer store, you overhear a customer asking Billy Bob what is the fastest computer in the store that he can buy. Billy Bob replies, "You're looking at our Macintoshes. The fastest Mac we have runs at a clock speed of 1.2 GHz. If you really want the fastest machine, you should buy our 2.4 GHz Intel Pentium IV instead." Is Billy Bob correct? What would you say to help this customer?

6. Compare zero, one, two, and three address machines by writing programs to compute $X=(A+B*C)/(D-E*F)$ for each of the four machines. The instructions available for use are as follows:

Zero address

PUSH M
POP M
ADD
SUB
MUL
DIV

One address

LOAD M
STORE M
ADD M
SUB M
MUL M
DIV M

Two address

MOVE ($X \leftarrow Y$)
ADD ($X \leftarrow X+Y$)
SUB ($X \leftarrow X-Y$)
MUL ($X \leftarrow X*Y$)
DIV ($X \leftarrow X / Y$)

Three Address

MOVE ($X \leftarrow Y$)
ADD ($T \leftarrow X + Y$)
SUB ($T \leftarrow X - Y$)
MUL ($T \leftarrow X * Y$)
DIV ($T \leftarrow X / Y$)