

1. Problem 5-2

What is the difference between a direct and an indirect address instruction? How Many references to memory are needed for each type of instruction to bring an operand into a processor register?

Direct address: 2 references

Read instruction

Read operand

Indirect address: 4 references

Read instruction

Read effective address

Read operand

2. Problem 5-4

The following register transfers are to be executed in the system of Fig. 5-4. For each transfer, specify:

(1) the binary value that must be applied to bus select inputs S2, S1, and S0

(2) the register whose LD control input must be active (if any)

(3) a memory read or write operation (if needed)

(4) the operation in the adder and logic circuit (if any)

a. AR ← PC

b. IR ← M[AR]

c. M[AR] ← TR

d. AC ← DR, DR ← AC (done simultaneously)

	S2S1S0	LD	Memory	Adder
a.	010	AR	-	-
b.	111	IR	read	-
c.	110	-	write	-
d.	100	AC, DR	-	Transfer DR to AC

3. Problem 5-7

What are the two instructions needed in the basic computer in order to set the E flip-flop to 1?

CLE

CME

4. Problem 5-8

Draw a timing diagram similar to Fig. 5-7 assuming that SC is cleared to 0 at time T3 if control signal C7 is active.

C7T3: SC \leftarrow 0

