LOVELY PROFESSIONAL UNIVERSITY

Tutorial-5

1: The register which holds the address of the location to or from which data are to be transferred is called

A. Index register
B. Instruction register
C. Memory address register
D. Memory data register

The following control inputs are active in the bus system shown in Fig. 5-4. For each case, specify the register transfer that will be executed during the next clock transition.

	S_2	S_1	S_0	LD of register	Memory	Adder
a.	1	1	1	*IR*	Read	—
b.	1	1	0	*PC*	—	—
c.	1	0	0	*DR*	Write	—
d.	0	0	0	*AC*	—	Add

(a) Memory read to bus and load to IR: IR ← M[AR]

(b) TR to bus and load to PC: PC ← TR

(c) AC to bus, write to memory, and load to DR:
DR ← AC, M[AR]← AC

(d) Add DR (or INPR) to AC: AC ← AC + DR

A group of bits that tell the computer to perform a specific operation is known as

(A) Instruction code

(B) Micro-operation

(C) Accumulator

(D) Register

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 S_2, S_1, and S_0; (2) the register whose LD control input must be active (if any); (3) a memory read or write operation (if needed); and (4) the operation in the adder and logic circuit (if any).

a. $AR \leftarrow PC$

b. $IR \leftarrow M[AR]$

c. $M[AR] \leftarrow TR$

d. $AC \leftarrow DR$, $DR \leftarrow AC$ (done simultaneously)

		(1) $S_2S_1S_0$	(2) Load(LD)	(3) Memory	(4) Adder
(a)	AR ← PC	010 (PC)	AR	—	—
(b)	IR ← M[AR]	111 (M)	IR	Read	—
(c)	M[AR] ← TR	110 (TR)	—	Write	—
(d)	DR ← AC AC ← DR	100 (AC)	DR and AC	—	Transfer DR to AC

The communication between the components in a microcomputer takes place via the address and

(A) I/O bus

(B) Data bus

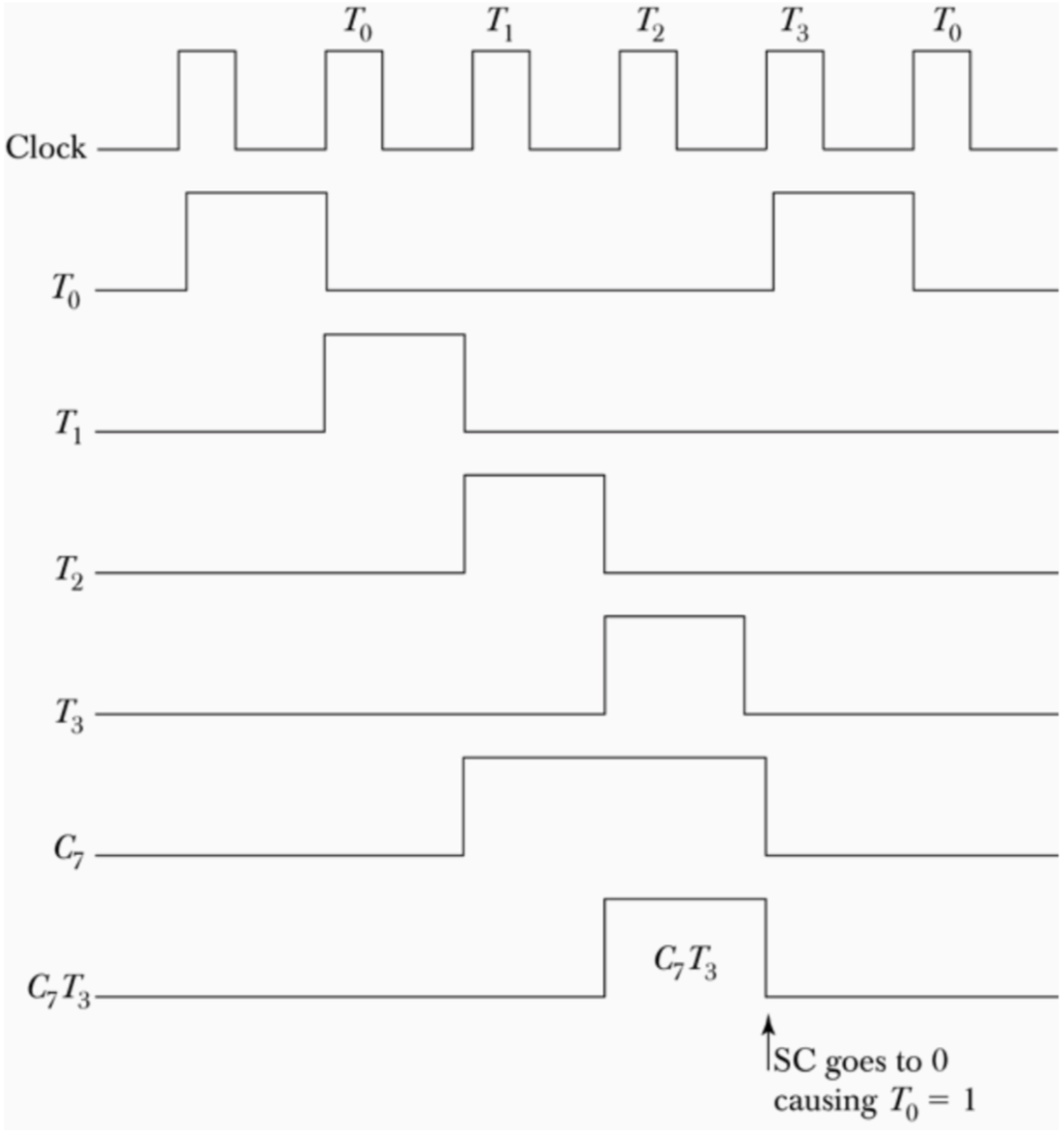
(C) Address bus

(D) Control lines

Draw a timing diagram similar to Fig. 5-7 assuming that SC is cleared to 0 at time T_3 if control signal C_7 is active.

$$C_7T_3: \quad SC \leftarrow 0$$

C_7 is activated with the positive clock transition associated with T_1.


T_0
T_1
T_2
T_3
T_0
Clock
T_0
T_1
T_2
T_3
C_7
C_7T_3
C_7T_3
SC goes to 0
causing $T_0 = 1$

The load instruction is mostly used to designate a transfer from memory to a processor register known as

(A) Accumulator

(B) Instruction Register

(C) Program counter

(D) Memory address Register

- WHAT ARE THE TWO INSTRUCTIONS NEEDED IN THE BASIC COMPUTER IN ORDER TO SET THE E-FLIP FLOP TO 1?

CLE Clear E

CME Complement E

_____ register keeps track of the instructions stored in program stored in memory.

(A) AR (Address Register)

(B) XR (Index Register)

(C) PC (Program Counter)

(D) AC (Accumulator)

State whether True or False:—-

An arithmetic shift left multiplies a signed binary number by 2

The BSA instruction is

(A) Branch and store accumulator

(B) Branch and save return address

(C) Branch and shift address

(D) Branch and show accumulator

_____is the sequence of operations performed by CPU in processing an instruction:

a. Execute cycle
b. Fetch cycle
c. Decode cycle
d. Instruction cycle

_____is the step during which a new instruction is read from the memory:

a. Decode
b. Fetch
c. Execute
d. None of these