**20.2**

**- Load Accumulator**

MAR <- (IR(Address)) C8

MBR <- Memory C5, CR

AC <- (MBR) C10

**- Store Accumulator**

MAR <- (IR(Address)) C8

MBR <- (AC) C11

Memory <- (MBR) C12, Cw

**- Add to Accumulator**

MAR <- (IR(Address)) C8

MBR <- Memory C5, CR

AC <- (AC) + (MBR) CALU, C7, C9

**- AND to accumulator**

MAR <- (IR(Address)) C8

MBR <- Memory C5, CR

AC <- (AC) AND (MBR) CALU, C7, C9

**- Jump**

PC <- (IR(Address)) C3

**- Jump if AC = 0**

AC == 0 이면 C3 활성화 C3

**- Complement Accumulator**

AC <- () CALU, C7, C9

**20.3**

a. time of data from one register to another : propagation time of bus(20ns) + copy time(10ns)

답 : 30ns.

b. program counter 의 동작은

pc + 1 -> Z (20 + 100 + 10 copytime) = 130ns.

Z -> pc ( data from register to another ) = 30ns

이렇게 진행된다.

답 : 160ns(130ns + 30ns)

**20.4**

**(a)**

Y <- (IR(Address))

Z <- (AC) + (Y)

AC <- (Z)

**(b)**

MAR <- (IR(Address))

MBR <- Memory

Y <- (MBR)

Z <- (AC) + (Y)

AC <- (Z)

**(c)**

MAR <- (IR(Address))

MBR <- Memory

MAR <- (MBR)

MBR <- Memory

Y <- (MBR)

Z <- (AC) + (Y)

AC <- (Z)