i)

| $A_1$ | $A_2$ | $t_3$ |
|---|---|---|
| 0 | 0 | alu-out |
| 0 | 1 | PC |
| 1 | 0 | mem-d |
| 1 | 1 | OFF |

ii)

| $B_1$ | $B_2$ | MEM-a |
|---|---|---|
| 0 | 0 | PC |
| 0 | 1 | $t_2$ |
| 1 | 0 | off |
| 1 | 1 | $t_1$ |

iii)

| $C_1$ | mem-d |
|---|---|
| 0 | $t_1$ |
| 1 | $t_2$ |

iv)

| $D_1$ | RF-$a_1$ |
|---|---|
| 0 | $IR_{9-11}$ |
| 1 | PEN-0 |

v)

| $E_1$ | $E_2$ | RF-$a_3$ |
|---|---|---|
| 0 | 0 | $IR_{9-11}$ |
| 0 | 1 | $IR_{6-8}$ |
| 1 | 0 | $IR_{3-5}$ |
| 1 | 1 | PEN-0 |

vi)

| $F_1$ | RF-$d_3$ |
|---|---|
| 0 | $t_3$ |
| 1 | $IR_{0-8}$ + 7S |

vii)

| $G_1$ | $G_2$ | ALU-a |
|---|---|---|
| 0 | 0 | $t_1$ |
| 0 | 1 | $t_3$ |
| 1 | 0 | $t_2$ |
| 1 | 1 | PC |

viii)

| $H_1$ | $H_2$ | ALU-b |
|---|---|---|
| 0 | 0 | +1 |
| 0 | 1 | $IR_{0-5}$ + SE6 |
| 1 | 0 | $t_2$ |
| 1 | 1 | $IR_{0-8}$ + SE9 |

ix)

| $I_1$ | $t_1$ |
|---|---|
| 0 | alu-out |
| 1 | RF-$d_3$ |

x)

| $J_1$ | $J_2$ | $t_2$ |
|---|---|---|
| 0 | 0 | RF-$d_1$ |
| 0 | 1 | alu-out |
| 1 | 0 | RF-$d_2$ |
| 1 | 1 | |

xi)

| $K_1$ | $K_2$ | ALU |
|---|---|---|
| 0 | 0 | ADD |
| 0 | 1 | ADD |
| 1 | 0 | NAND |
| 1 | 1 | XOR |

xii)

| $L_1$ | C |
|---|---|
| 0 | $\overline{\text{Modify}}$ |
| 1 | Modify |

xiii)

| $L_2$ | Z |
|---|---|
| 0 | Modify |
| 1 | $\overline{\text{Modify}}$ |

xiii)

| $M_1$ | $M_2$ | $M_3$ | R7 |
|---|---|---|---|
| 1 | 1 | 0 | PC |
| 0 | 0 | 1 | $t_3$ |
| 0 | 0 | 0 | alu-out |
| 0 | 1 | 0 | $t_2$ |
| others | | | RF-$d_3$ |

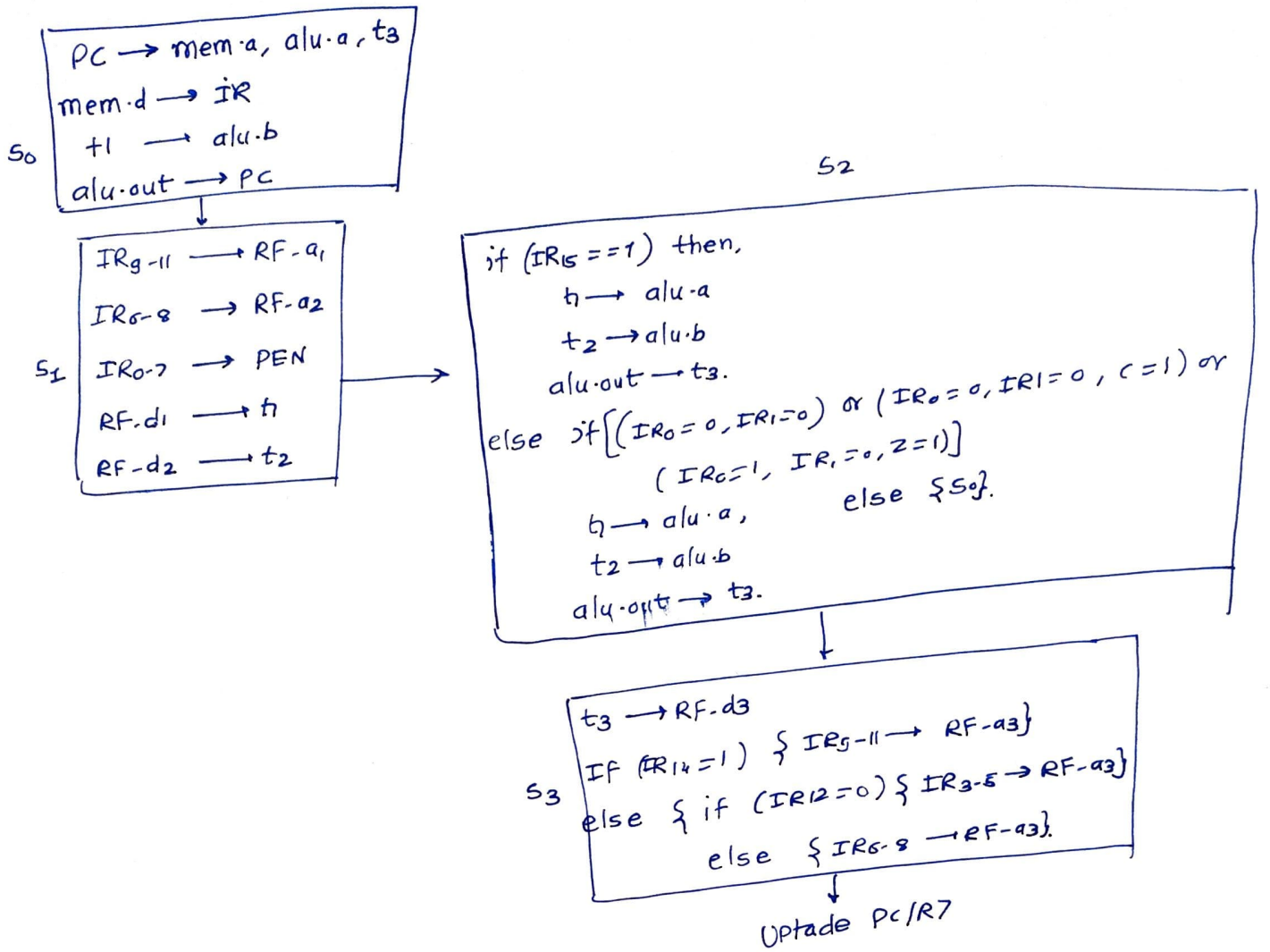
xiv)

| N | PE (Register) |
|---|---|
| 0 | PE-0 |
| 1 | $IR_{0-7}$ |

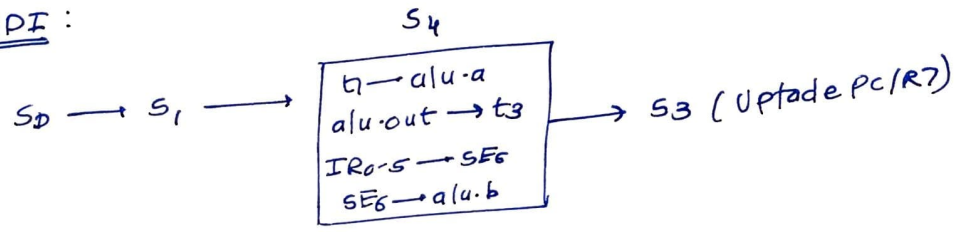
(xv)

| $P_1$ | $P_2$ | PC |
|---|---|---|
| 0 | 0 | alu-out |
| 0 | 1 | $t_3$ |
| 1 | 0 | $t_2$ |
| 1 | 1 | off |

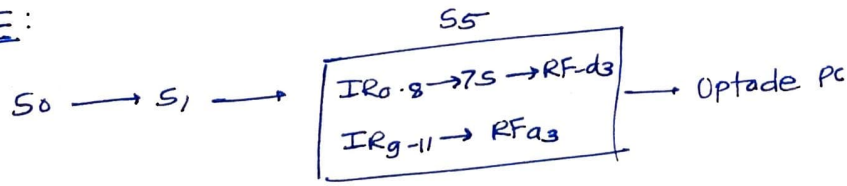
i) ADD, ADC, ADZ, NDU, NDC, NDZ:



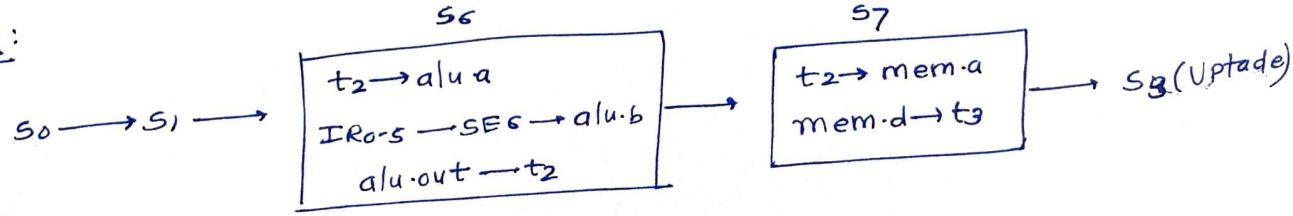

④ ADI:



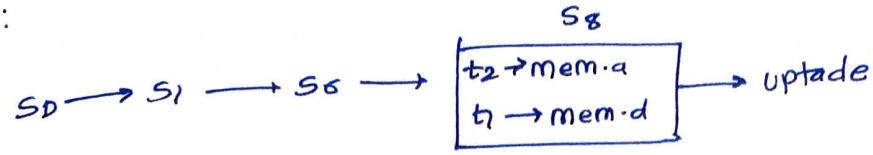

⑧ LHI:



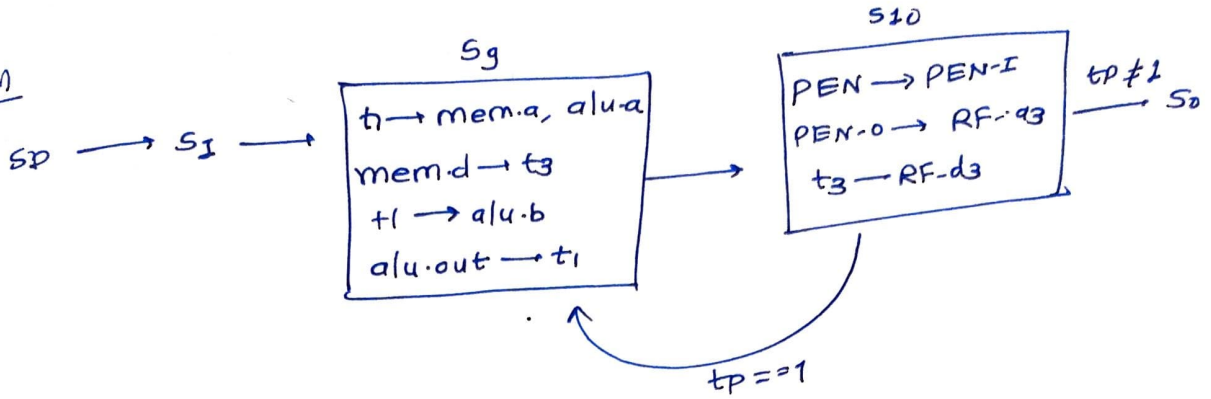

⑨ LW:



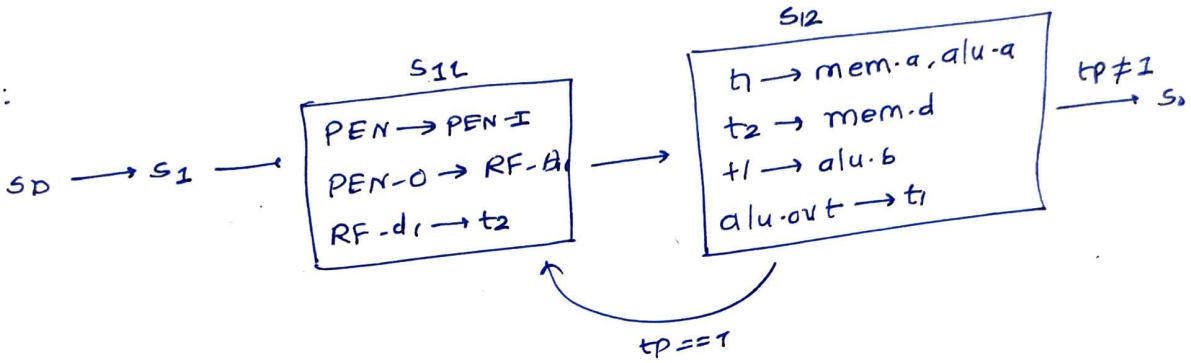
(10) SW:



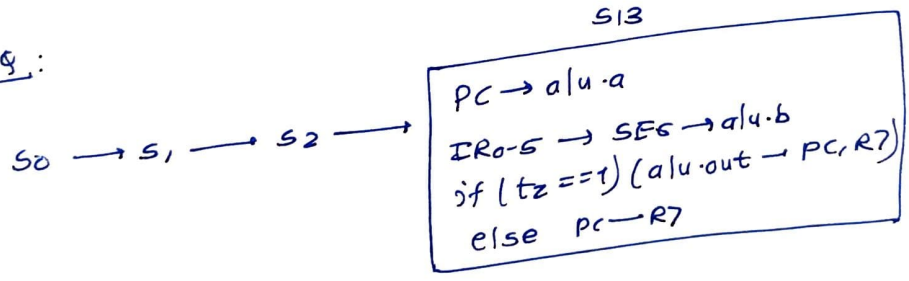

(11) LM



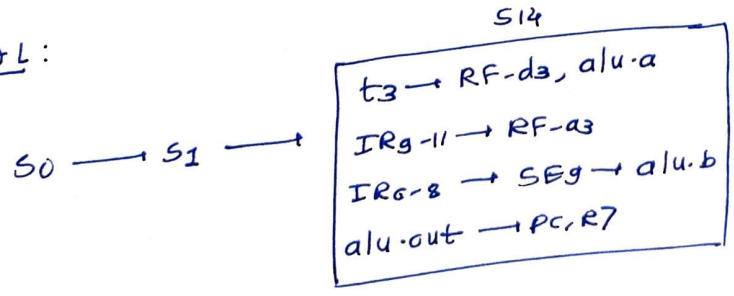

(12) SM:




(13) BEQ:




(14) JAL:




(15) JLR: