**Control Funtion And Microoperations of the DEUSEM**

Fetch T0 AR🡨PC

T1 IR🡨M[AR], PC🡨PC+1

Decode T2 D0...D63 Decode IR(4..9), AR🡨IR(0..3), I🡨IR(10)

Indirect ID’63T3 AR🡨M[AR]

**Memory Referance**

OR D1T4 DR🡨M[AR]

D1T5 AC🡨AC v DR, SC🡨0

AND D2T4 DR🡨M[AR]

D2T5 AC🡨AC Λ DR, SC🡨0

XOR D3T4 DR🡨M[AR]

D3T5 AC🡨 AC ⊕ DR, SC🡨0

ADD D4T4 DR🡨M[AR]

D4T5 AC🡨AC + DR, E🡨Cout, SC🡨0

LDA D5T4 DR🡨M[AR]

D5T5 AC🡨DR, SC🡨0

STA D6T4 M[AR]🡨AC, SC🡨0

BUN D7T4 PC🡨AR, SC🡨0

BSA D8T4 M[AR]🡨PC, AR🡨AR+1

D8T5 PC🡨AR, SC🡨0

ISZ D9T4 DR🡨M[AR]

D9T5 DR🡨DR+1

D9T6 M[AR]🡨DR, if( DR=0 ) then ( PC 🡨 PC+1 ), SC🡨0

JMR D10T4 DR🡨AR, AC🡨PC

D10T5 AC🡨AC+DR, E🡨Cout

D10T6 PC🡨AC , S🡨0

**Register Referance**

I’D63T3 = r

Decode B0...B15 🡨 Decode IR(3..0), S🡨0

CLA rB2 AC🡨0

CLE rB3 E🡨0

INC rB4 AC🡨AC + 1

LBA rB5 AC🡨BUS

CMA rB6 AC🡨AC’

CIR rB7 AC🡨shrAC, AC(3)🡨E, E🡨AC(0)

CIL rB8 AC🡨shlAC, AC(0)🡨E, E🡨AC(3)

SNA rB10 if( AC(3) = 1 ) then PC🡨PC + 1

SZA rB11 if( AC = 0 ) then PC🡨PC + 1

SZE rB12 if( E = 0 ) then PC🡨PC + 1

HLT rB1 S🡨0

CML rB9

**Input-Output**

D63IT3 = p

Decode B0...B15🡨Decode IR(3..0) S🡨0

INP pB2 AC🡨INPR, FGI🡨0

OUT pB3 OUTR🡨AC, FGO🡨0

SKI pB4 if( FGI = 1 ) then PC🡨PC + 1

SKO pB5 if( FGO = 1 ) then PC🡨PC + 1

DSI

OPP

**Stack**

PSH D11T4 AR🡨M[AR]

D11T5 M[AR]🡨AC

D11T6 M[0]🡨M[0] + 1

POP D12T4 M[0]🡨M[0] – 1

D12T5 AR🡨M[0]

D12T6 AC🡨M[AR]

SZN D13T4 if( M[0] = 0 ) then PC🡨PC + 1

SPF D14T4 if( M[0] = 64 ) then PC🡨PC + 1