Design 8086 based minimum mode system for
256kB RAM using 64kB
128kB EPROM using 64kB.

I Total EPROM required 128kB
Chip size available = 64kB
No. of Chips required = $\frac{128}{64} = 2$

No. of sets required = $\frac{\text{No. of chips}}{\text{No. of Banks}} = \frac{2}{2} = 1$

Ending address = FFFFF H
set size = Chip size X 2 = 64X2 = 128kB
128kB = 2^{17}
= 0001 1111 1111 1111 1111
= 1 F F F F

Starting address = Ending address − SET size
= FFFFF H − 1FFFF
= E0000 H.

		Even Bank	odd Bank
ROM.	Starting address	E0000	E0001 H.
	Ending address	FFFFE	FFFFF H.

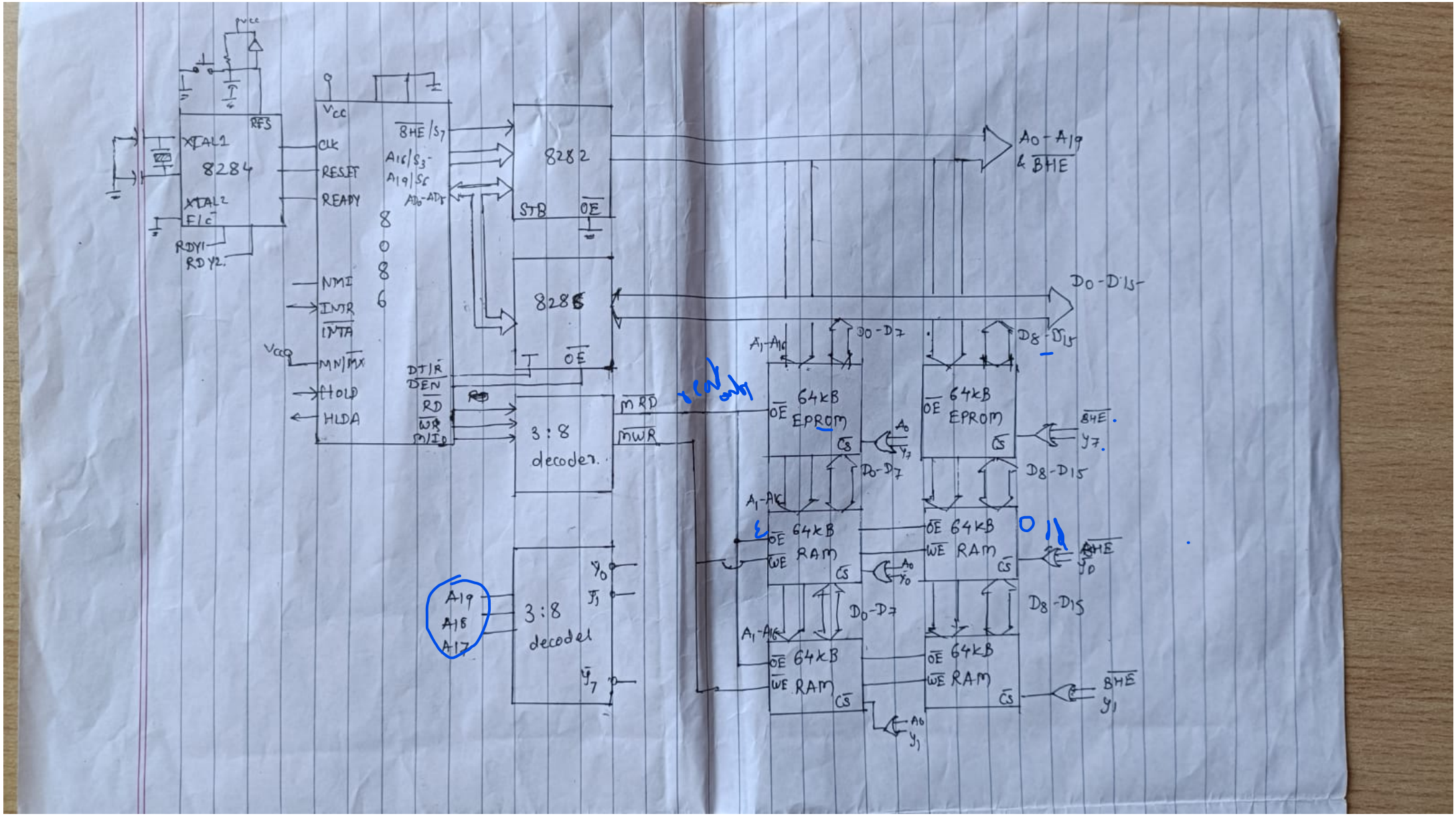
$2^2 = 4$
$2^3 = 8$
$2^4 = 16$
$2^5 = 32$
$2^6 = 64$
$2^7 = 128$
$2^8 = 256$
$2^9 = 512$
$2^{10} = 1024 = 1k$
$2^{11} = 2048 = 2k$
$2^{12} = 4k.$
$2^{13} = 8k$
$2^{14} = 16k$
$2^{15} = 32k$
$2^{16} = 64k$
$2^{17} = 128k$

II Total RAM required is 256kB
Chip size available = 64kB.
∴ No. of chips required = $\frac{256}{64} = 4$

No. of sets = 4/2 = 2.
SET 1: Starting address = 00000 H.
set size = 64X2 = 128kB = 2^{17} = 1FFFF H.
Ending address = Starting address + SET size
= 00000 H + 1FFFF H = 1FFFE H
SET 2: Starting address = 20000 H
Ending address = 20000 + 1FFFF H = 3FFFF H

		Even Bank	odd Bank
Set 1	Starting	00000 H	00001 H
	Ending Address	1FFFE H	1FFFF H.
Set 2	Starting Addr	20000 H	20001 H
	Ending Addr.	3FFFE H	3FFFF H.

	A_{19}	A_{18}	A_{17}	A_{16}	A_{15}	A_{14}	A_{13}	A_{12}	A_{11}	A_{10}	A_9	A_8	A_7	A_6	A_5	A_4	A_3	A_2	A_1	A_0
RAM EB SA 00000H Set1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EA FFFFH	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
OB SA: 00001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
EA: 1FFFF	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
RAM EB SA 20000 Set2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EA 3FFFF	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
OB 20001	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3FFFFH	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ROM E0000	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FFFFE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
E0001	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
FFFFF	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1


8284
XTAL1
XTAL2
RES
F/C
RDY1
RDY2
CLK
RESET
READY
8086
NMI
INTR
INTA
MN/MX
HOLD
HLDA
DT/R
DEN
RD
WR
M/IO
8282
STB
OE
3:8 decoder
A19
A18
A17
MRD
MWR
64kB EPROM
64kB RAM
A0-A19
& BHE
D0-D15
D0-D7
D8-D15
A1-A16
BHE
A0

Design an 8086 based maximum mode system working at 6 MHz
32 KB EPROM using 16 KB chips.
128 KB RAM using 32kB chips

I. Total EPROM required 32KB.
Chip size = 16kB.
∴ No. of Chips required = $\frac{32}{16} = 2$
∴ No. of sets required
$\frac{2}{2} = 1$.

Ending address = FFFFF H.
set size = Chip size × 2 = 16 × 2 = 32kB.
32KB = 2^{15}
= 0000 0111 1111 1111 1111
= 0 7 F F F
Starting address = Ending address − set size
= FFFFF − 07FFF
= F8000 H

		(Even)	(odd)
ROM	Starting addr.	F8000 H	F8001 H
	Ending address	FFFFE H	FFFFF H

II Total RAM reqd = 128kB.
chip size = 32 KB.
∴ No. of chips reqd = $\frac{128}{32} = 4$ No. of sets reqd = $\frac{4}{2} = 2$.

Set 1. set size = 32 × 2 = 64 kB = 2^{16} = 0FFFF H.
Ending addr = Starting addr + set size = 00000 + 0FFFF
= 0FFFF H

Set 2 Starting address. = 10000 H
Ending addr. = 10000 + 0FFFF H = 1FFFF H.

		Even Bank	odd Bank
Set 1	Starting addr.	00000 H.	00001 H
	Ending addr.	0FFFE H	1FFFF H
set 2	starting addr	10000H	10001 H
	Ending addr	1FFFEH	1FFFF H

		A_{19}	A_{18}	A_{17}	A_{16}	A_{15}	A_{14}	A_{13}	A_{12}	A_{11}	A_{10}	A_9	A_8	A_7	A_6	A_5	A_4	A_3	A_2	A_1	A_0
RAM.																					
Set 1	00000H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0FFFEH	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
	00001H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	0FFFFH	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Set 2	10000H	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1FFFEH	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
	10001	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	1FFFF	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ROM	F8000	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	FFFFE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
	F8001	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	FFFFF	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1