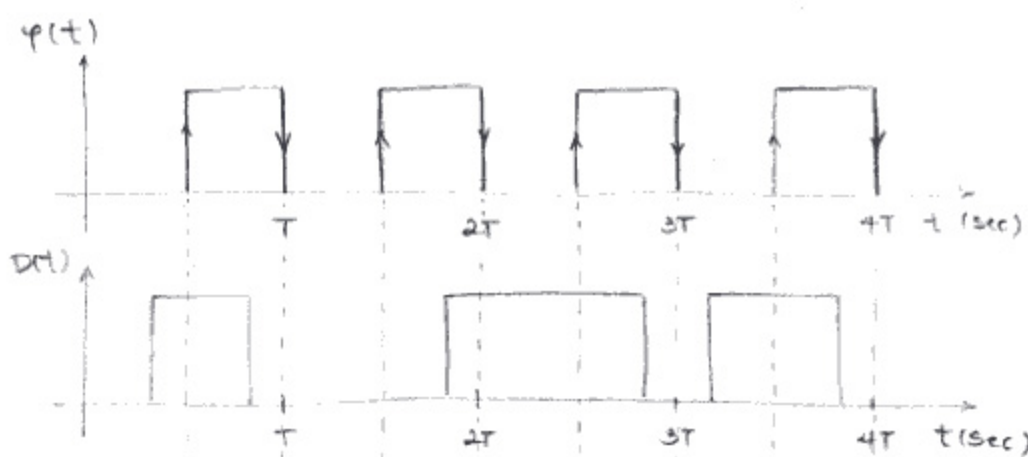
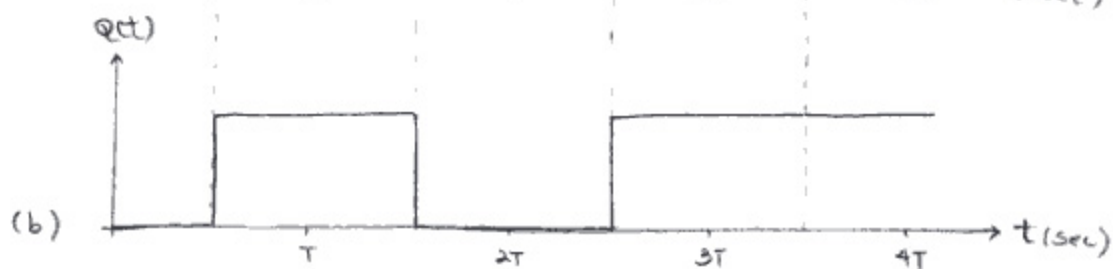


1)	Binary	Decimal	Octal	Hex
	1011 0010	178	262	B2
	1011 1010	186	272	BA
	1101 1110	222	336	DE
	1001 0101	149	225	95

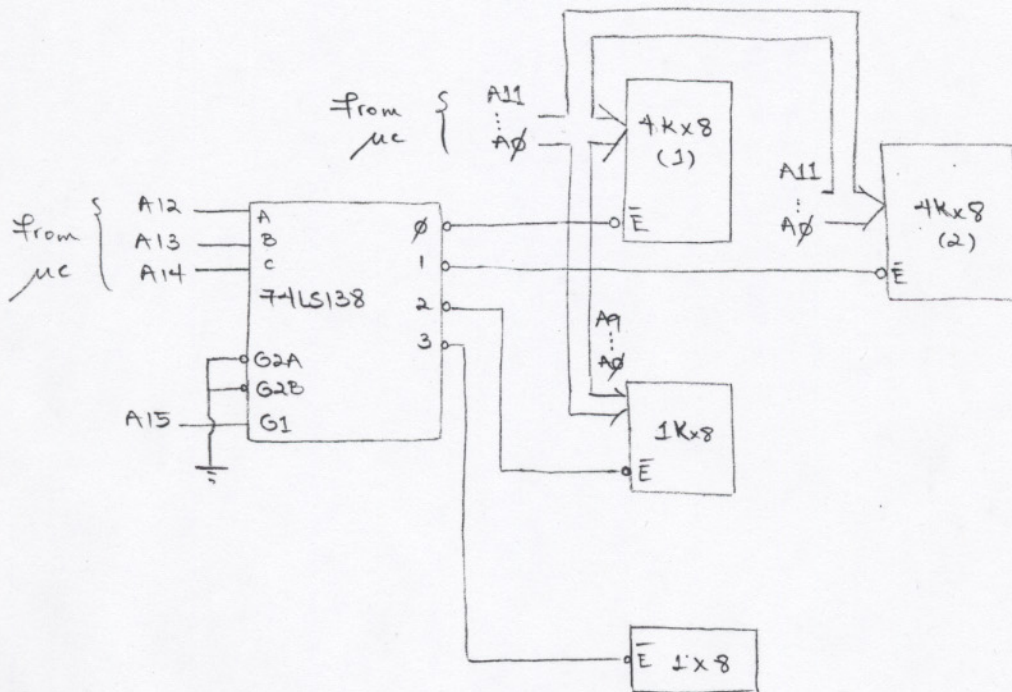
2,



(a)



3)



a) We need to distinguish among 4 different devices, hence we use 4 of the decoder's 8 outputs, each output enables one of the devices.

Each of the 4K chips needs 12 address lines to address its $4K = 4096 = 2^{12}$ internal locations.

The $1K = 1024 = 2^{10}$ chip needs 10 address lines.

The 1 byte register doesn't need any address lines as it has $1 = 2^0$ locations only.

3, Continued:

For $4K \times 8$ (chip labeled 1) :

A15	A14	A13	A12	A11	A10	A9	A8	A7	A6	A5	A4	A3	A2	A1	A0
1	0	0	0	0	0	...	...	...	...	...	...	...	...	...	0
└─┬─┐ enables decoder		└─┬─┐ selects device			└──────────────────────────────────┐ can vary from all 0's to all 1's										

1	0	0	0	1	1	1
---	---	---	---	---	---	-----	-----	-----	-----	-----	-----	-----	-----	-----	---

The address space will be from $\overline{8000}$ to $\overline{8FFF}$

Similarly, for the second $4K \times 8$:

1	0	0	1	0	...	...	...	...	...	...	...	...	...	...	0
to	1	0	0	1	1	...	...	...	...	...	...	...	...	...	1

The address space will be from $\overline{9000}$ to $\overline{9FFF}$.

For the $1K \times 8$,

A15	A14	A13	A12	A11	A10	A9	A8...	A0
1	0	1	0	x	x	0	0	0
to	1	0	1	0	x	x	1	1

Address space will be from $\overline{Ax00}$ to $\overline{Ax11}$

because A11 and A10 are don't cares.

The address space for the 1-byte register will be ;

A15	A14	A13	A12	A11	A10	A9	A8...	A0
1	0	1	1	x	...	x	...	x

corresponding to \overline{Bxxx}

3 (continued)

Note that internally each of the $4K \times 8$ memory chips will have addresses ranging from:

A11	A10	...	A0	
0	0	...	0	to
1	1	...	1	

corresponding to 000_x to FFF_x .

The $1K \times 8$ will have internal addresses from

A9	A8	...	A0	to	A9	A8	...	A0
0	0	...	0		1	1	...	1

4/ ① Difference in HW. The μP is a single-chip CPU.
The μC contains μP 's, RAM, ROM, I/O, timers, etc.

② Difference in applications:

μP is for arithmetic and logic operations, is flexible and can be used for various tasks.

μC is used for controlling other devices, generally programmed for a single, dedicated task.

③ Difference in instruction set features:

μP has a processing-intensive instruction set.

μC " " control " " " " .