Soln. Tutorial #10:

1. Binary equivalent of
12 → 1100
13 → 1101
14 → 1110
15 → 1111

A_7	A_6	A_5	A_4	A_3	A_2	A_1	A_0
0	0	0	0	1	1	0	0
0	0	0	0	1	1	0	1
0	0	0	0	1	1	1	0
0	0	0	0	1	1	1	1
← CS →						↓ RS_1	↓ RS_0

So, $CS = A_2 A_3 A_4' A_5' A_6' A_7'$
$RS_0 = A_0$
$RS_1 = A_1$
} for external circuit.

2.

Interface	Port A	Port B	Port C (control Reg.)	Port D (status Reg.)
no. # 1	10000000	10000001	10000010	10000011
2.	01000000	01000001	01000010	01000011
3.	00100000	00100001	00100010	00100011
4.	00010000	00010001	00010010	00010011
5.	00001000	00001001	00001010	00001011
6.	00000100	00000101	00000110	00000111

3.

inserted @ m bytes/sec. max. capcity K bytes.
deleted @ n bytes/sec.

a. empty buffer to fill when $m > n$, required time = $\frac{K}{m-n}$ sec
b. full buffer to empty when $m < n$, required time = $\frac{K}{n-m}$ sec
c. FIFO buffer is not required when $m = n$.

4. 1200 baud line → 1200 bits per second can be transmitted.

a. So for synchronous serial transmission no. of characters

$$= \frac{1200}{8}$$

$$= 150 \text{ char per second.}$$

b. Asynchronous serial transmission one bit for control signal.
with two stop bits.

so apart from 8 bits for a character 3 more bits

so total $8+3 = 11$ bits

so no. of characters $= \frac{1200}{11} = 109$ characters per second.

c. When asynchronous serial transmission ~~for~~ with one stop bit

so total $8+1+1 = 10$ bits.

so no. of characters $= \frac{1200}{10} = 120$ characters per second.

5. 20 MHz clock. i.e $\frac{1}{20} = 50$ ns clock pulse duration.
the access time to memory unit is 40 ns.