BIT ADDRESSABLE MEMORY LOCATIONS IN RAM

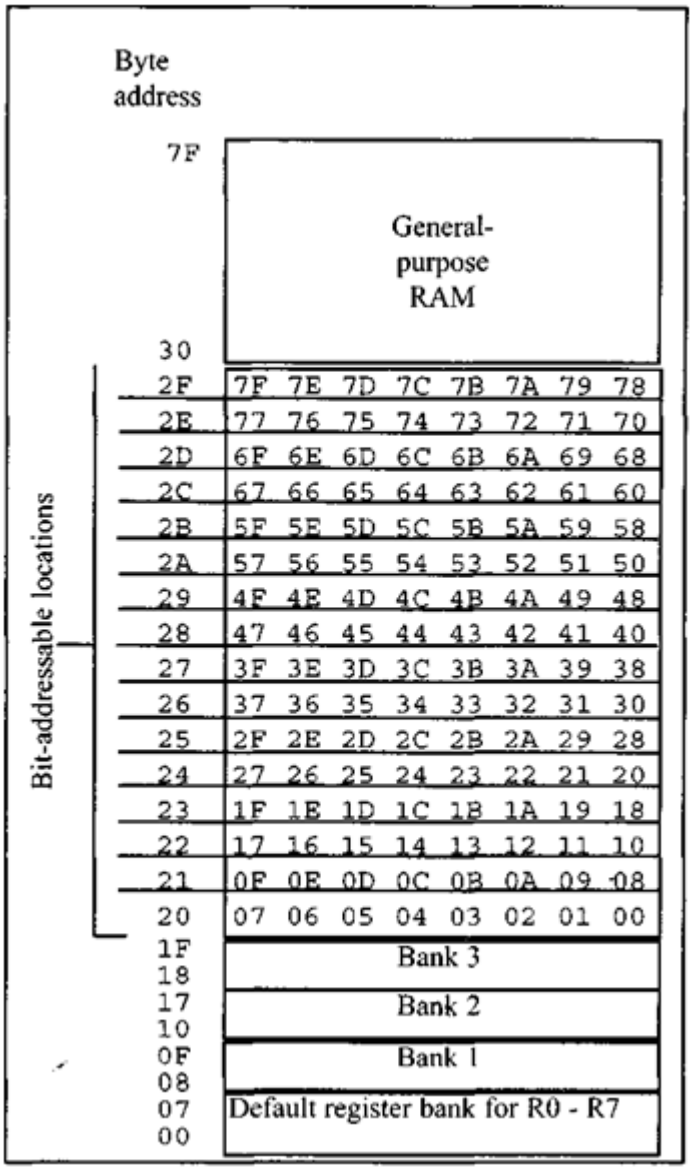
RAM 128 divided into 3 partitions

1. 32 bytes register Banks(Bank0 Bank1,Bank2,Bank3)
2. 16 bytes for bit address for RAM
3. 80 Bytes for Bit address for I/O

RAM 128k

32 Bytes	16 Byes	80Bytes Bit address

16 bytes for bit address for RAM



Find out to which byte each of the following bits belongs. Give the address of the RAM byte in hex.

```
(a) SETB 42H ;set bit 42H to 1 (d) SETB 28H ;set bit 28H to 1
(b) CLR 67H ;clear bit 67     (e) CLR 12 ;clear bit 12 (decimal)
(c) CLR 0FH ;clear bit 0FH    (f) SETB 05
```

Solution:

(a) RAM bit address of 42H belongs to D2 of RAM location 28H.
(b) RAM bit address of 67H belongs to D7 of RAM location 2CH.
(c) RAM bit address of 0FH belongs to D7 of RAM location 21H.
(d) RAM bit address of 28H belongs to D0 of RAM location 25H.
(e) RAM bit address of 12 belongs to D4 of RAM location 21H.
(f) RAM bit address of 05 belongs to D5 of RAM location 20H.

In order to avoid confusion regarding the addresses 00 – 7FH, the following two points must be noted.

1. The 128 bytes of RAM have the byte addresses of 00 – 7FH and can be accessed in byte size using various addressing modes such as direct and register-indirect, as we have seen in this chapter and previous chapters. These 128 bytes are accessed using byte-type instructions.

2. The 16 bytes of RAM locations 20 – 2FH also have bit addresses of 00 - 7FH since 16 x 8 =128(00-7FH). In order to access these 128 bits of RAM locations and other bit-addressable space of 8051 individually, we can use only the single-bit instructions such as SETB.

80 Bytes for Bit address for I/O

4 Ports (P0,P1,P2,P3)

P0	Addr	P1	Addr	P2	Addr	P3	Addr	Port's Bit
P0.0	80	P1.0	90	P2.0	A0	P3.0	B0	D0
P0.1	81	P1.1	91	P2.1	A1	P3.1	B1	D1
P0.2	82	P1.2	92	P2.2	A2	P3.2	B2	D2
P0.3	83	P1.3	93	P2.3	A3	P3.3	B3	D3
P0.4	84	P1.4	94	P2.4	A4	P3.4	B4	D4
P0.5	85	P1.5	95	P2.5	A5	P3.5	B5	D5
P0.6	86	P1.6	96	P2.6	A6	P3.6	B6	D6
P0.7	87	P1.7	97	P2.7	A7	P3.7	B7	D7

For each of the following instructions, state to which port the bit belongs. Use Table 5-3.

```
(a) SETB 86H      (b) CLR 87H      (c) SETB 92H      (d) SETB 0A7H
```

Solution:

(a) `SETB 86H` is for `SETB P0.6`.
(b) `CLR 87H` is for `CLR P0.7`.
(c) `SETB 92H` is for `SETB P1.2`.
(d) `SETB 0A7H` is for `SETB P2.7`.