**8 Bit 2’s Complement +ve number (Range: -128 …. -1 to 0… +127)**

**+76 (01001100)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **-128** | **64** | **32** | **16** | **8** | **4** | **2** | **1** |
| **0** | **1** | **0** | **0** | **1** | **1** | **0** | **0** |

**64+8+4 = 76**

**76 – 64 = 12**

**12 – 32 = X, 12 – 16 = X**

**12 – 8 = 4**

**4 – 4 = 0**

**6 bit (range: -32 to +31)**

**+18**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **-32** | **16** | **8** | **4** | **2** | **1** |
| **0** | **1** | **0** | **0** | **1** | **0** |

**18-16 =2 , 2-2=0**

**8 Bit 2’s Complement -ve number (Range: -128 …. -1 to 0… +127)**

**-76**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **-128** | **64** | **32** | **16** | **8** | **4** | **2** | **1** |
| **1** | **0** | **1** | **1** | **0** | **1** | **0** | **0** |

**-128 + ? = -76 -128+32+16+4= -76**

**128-76 = 52**

**52 -64 = X , 52- 32= 20, 20-16= 4, 4-8=X, 4-4=0**

**6 bit (range: -32 to +31)**

**-18**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **-32** | **16** | **8** | **4** | **2** | **1** |
| **1** | **0** | **1** | **1** | **1** | **0** |

**-32 +? = -18 , -32+14=-18, -32+8+4+2= -18**

**32-18= 14**

**14 -16= X, 14-8=6, 6-4= 2, 2-2=0**

**-76 +76 (01001100)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2’s** | **1** | **0** | **1** | **1** | **0** | **1** | **0** | **0** |
| **SM** | **1** | **1** | **0** | **0** | **1** | **1** | **0** | **0** |
| **1’s** | **1** | **0** | **1** | **1** | **0** | **0** | **1** | **1** |

**+76 (01001100)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **-128** | **64** | **32** | **16** | **8** | **4** | **2** | **1** |
| **0** | **1** | **0** | **0** | **1** | **1** | **0** | **0** |

**-76**

**1’s complement (2= 10, 3=11)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **0** | **1** | **1** | **0** | **0** | **1** | **1** |

**+ 1**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **0** | **1** | **1** | **0** | **1** | **0** | **0** |

**2’s Complement**

**Ex-3 Code**

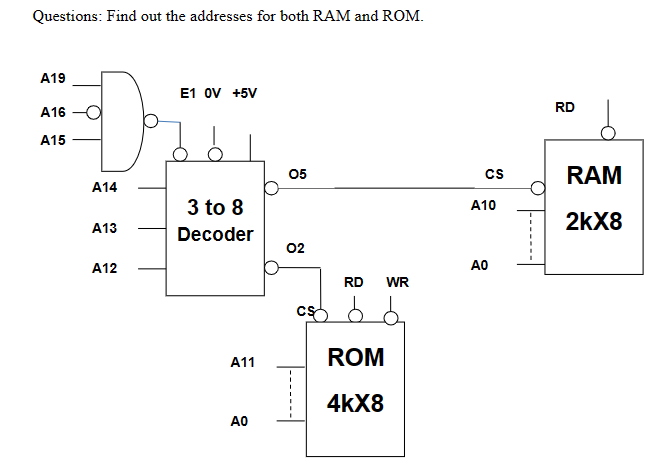
**APPLE 1 16 16 12 5**

**4(1+3) 19 (16+3)**

**DSSOH**

**Binary to gray**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **0** | **0** | **0** | **0** | **0** | **0** |
| **0** | **0** | **1** | **0** | **0** | **1** |
| **0** | **1** | **0** | **0** | **1** | **1** |
| **0** | **1** | **1** | **0** | **1** | **0** |
| **1** | **0** | **0** | **1** | **1** | **0** |
| **1** | **0** | **1** | **1** | **1** | **1** |
| **1** | **1** | **0** | **1** | **0** | **1** |
| **1** | **1** | **1** | **1** | **0** | **0** |

****