

Homework #1 — Due 9/14/98

1. Convert the following to decimal:

$$1101_2 \quad 8+4+0+1 = 13$$

$$244_8 \quad 2*64+4*8+4 = 164$$

$$2B9_{16} \quad 2*256+11*16+9 = 697$$

2. Convert the following to binary:

$$89_{10} \quad 89/2=44, \text{ rem } 1$$

$$44/2=22, \text{ rem } 0$$

$$22/2=11, \text{ rem } 0$$

$$11/2=5, \text{ rem } 1$$

$$5/2=2, \text{ rem } 1$$

$$2/2=1, \text{ rem } 0$$

$$1/2=0, \text{ rem } 1 \quad 1011001_2$$

$$1C4_{16} \quad 0001 \ 1100 \ 0100_2$$

$$56_8 \quad 101 \ 110_2$$

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3. Convert the following to octal:

$$12.484375_{10}$$

$$12/8=1, \text{ rem } 4$$

$$1/8=0, \text{ rem } 1 \quad 14_8$$

$$0.484375 \times 8 = 3.875$$

$$0.875 \times 8 = 7.0 \quad 14.37_8$$

$$1010_2 \quad \underline{001} \ 010 \quad 12_8$$

$$9E7_{16} \quad 1001 \ 1110 \ 0111$$

$$100 \ 111 \ 100 \ 111 \quad 4747_8$$

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4. Give the 8-bit two's complement encoding of the following:

$$-46_{10} \quad 256-46=210 \quad 11010010$$

$$78_{10} \quad 11101_2 \quad 01001110$$

5. The UPC code for Ty Inc's Beanie Babie named "Bernie" begins 0 08421 04109. Show the computation of the check sum.

$$(0+8+2+0+1+9)(3)+(0+4+1+4+0)=$$

$$20(3)+9=69 \quad \text{multiple is } 70$$

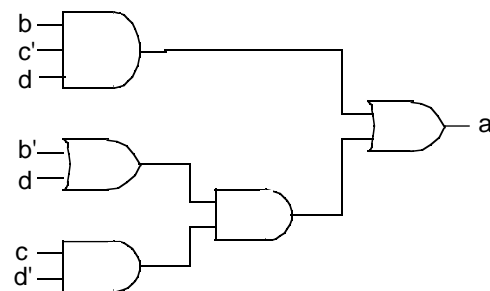
$$\text{check sum is } 70-69 = 1$$

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6. Draw the combinational circuit that directly implements the Boolean expression $a = bc'd + (b' + d)(cd')$



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