ShanghaiTech University

EE 115B: Digital Circuits

Fall 2022

Homework 1

Total: 100 Points

Assigned: September 20, 2022. Due: September 27, 2022.

1. Number conversions. (40 points, 5 points each.)
   (1) $(17.25)_{10}$ to binary.
   (2) $(10110.101)_{2}$ to decimal.
   (3) $(2D.8)_{16}$ to decimal.
   (4) $(35.25)_{10}$ to octal.
   (5) $(12E.2)_{16}$ to binary.
   (6) $(110.01)_{2}$ to octal.
   (7) $(3C.2)_{16}$ to octal.
   (8) $(72.4)_{8}$ to hexadecimal.
2. Code conversions. (10 points, 5 points each.)
   (1) $(547)_{10}$ to BCD.
   (2) $(001001100001)_{BCD}$ to decimal.
3. Complete the 5-bit Gray code table using the bit patterns discussed in class. Note that the first code corresponding to the decimal number of 0 is "00000" and the bit pattern for the rightmost bit is "0110". (32 points, 1 point each.)

Decimal	Gray Code
0	00000
1	
2	
3	
4	
5	
6	
7	
8	
9	

10	
11	
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4. Determine the odd parity bit for the following codes. (10 points, 5 points each.)
   (1) 1111
   (2) 100101
5. For an even parity system, determine if the following codes (the parity bit is included) are in error assuming that if there is indeed an error, only one bit is corrupted (i.e., errors involving multiple bits are not considered). (8 points, 4 points each.)
   (1) 101011
   (2) 1000