

Digital Design & Verilog – Beginner Assignment

PART A: Digital Logic Warm-Up

- 1) 255.375 into
 - a) Binary : 11111111.011
 - b) Octal : 377.3
 - c) Hex : FF.6
- 2) 110101.101 into decimal : 53.625
- 3) Is 100111 divisible by 3?
 - a) Notice that every other power of two gives remainder of 1 or 2 with 3 ($2^0\%3=1$, $2^1\%3=2$, $2^2\%3=1$, $2^3\%3=2$, etc)
 - b) Infer that if the number of powers that give 1 and the number of powers that give 2 are the same then number must be divisible by 3
 - c) As 100111 has the same number of 1s in even and odd place, this means that the number is divisible by 3
- 4) -23 in binary is 11101001
- 5) $F = (A + B)(A' + C)(B + C')$
 - a) Expand first two brackets $(AC+A'B+BC)(B + C')$
 - b) Expand again $AC(B+C') + A'B(B+C') + BC(B+C')$
 - c) This leaves us with $ABC + A'B + A'BC' + BC$
 - d) Considering that $A'B$ and $A'BC'$ are in OR condition and second term has exact same conditions as first except for C' , we can say that the result this setup is just the result of $A'B$ therefore we can delete the second term
 - e) Same is done for $BC + ABC$
 - f) This leaves us with final answer $A'B + BC$
- 6) From the table we can see that the values of A and B do not matter, the only one that matters is C, therefore $F = C$

A/BC	00	01	11	10
A=0	01	1	1	0
A=0	0	1	1	0