Hank  Bae

400062215

1.a)  $f = 2.27$ GHz

b)
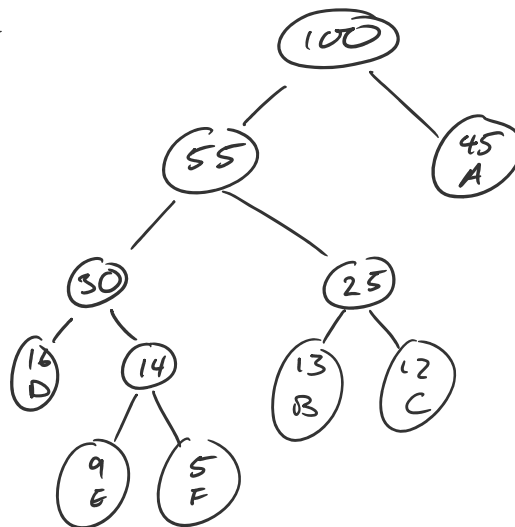


$70 + 100 + 100 = 270$ ps

$\therefore f = 3.70$ GHz
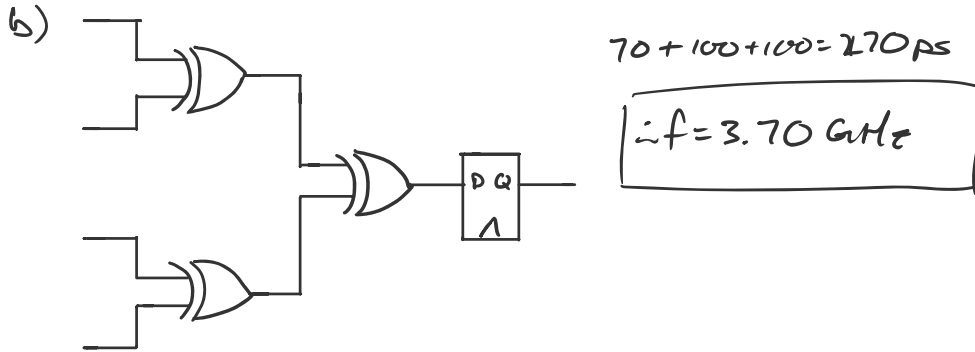
2.a)

| A | 000 |
|---|-----|
| B | 001 |
| C | 010 |
| D | 011 |
| E | 100 |
| F | 101 |

$\therefore$ 3 bits

b)

| A | 45 |
|---|----|
| B | 13 |
| C | 12 |
| D | 16 |
| E | 9 |
| F | 5 |

→

| A | 45 | 30 |
|---|----|----|
|   |    | 25 |
| D | 16 |    |
| B | 13 | 14 |
| C | 12 |    |
| E | 9 |    |
| F | 5 |    |



$A = 1$      : 45

$D = 000$  : 16

$B = 010$  : 13

$C = 011$  : 12

$E = 0010$ : 9

$F = 0011$ : 5

$\therefore 2.24$ bits

3.) when dividing the coefficients by the Quantizer matrix, the resulting value can be $\emptyset$ which means a lot of information can be lost