SOLUTIONS

1.

To calculate yield of wafer:

First year we assume it works with %80 yield which is means

120*80/100= 96 dies works then for each year we should multply it by 0.9 because it decreases %10 each year so %90 of dies works. And we make it 4 times because we need tto find what yield is after 4 years so the calculations:

96*(0.9)^4=

96*0.6561=62.9856 dies works after 4 year

Second we need to calculate cost its 10000 for first year then it decreases %20 for each year. Which means we get for each year %80 of cost which means multiplying by 0.8

10000*(0.8)^4=

10000*0.4096=4096$ after 4 year to find cost of a single chip:

4096/62.9856 = **65.0307$ per die**

2.

a)

To calculate for first compiler we need to multiply each instruction aby their cycle times

Compiler A: 50*2 + 10*4 + 2*3= 146 *10^6 cycle needs to complete for first compiler
Compiler B: 80*2 + 5*4 + 1*3= 183 *10^6 cycle needs to complete for second compiler

Since the first compiler is complete with less cycle ,means the **first compiler** performance is better than second one.

And if we divide them according to their cycles we can talk about how many times is better one on another

183/146= 1,2534 First compiler **1,2534** times better than second one.

b)

Since the better compiler executes 146*10^6 cycles to complete program.

146*10^6 /X =0.1s(100ms)

x = 146*10^7 cycles

1 MHz executes 1*10^6 cycles per second

1GHz executes 1*10^9 cycles per second

146*10^7/1*10^9 = **1.46 GHz**

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