Didado

# Problemas

**6.1.**

a) CPI = ¼ = 0.25 c/i
b) 20c x 4 = 80instr
c) CPI = 0.25+20*0.2 = 4.25 c/i
d) 4.25/0.25 = 17
e) CPI = 0.25+20*0.2*0.05 = 0.45 c/i
f) speedup = 4.25/0.45 = 9.44

**6.2**

a) IPC = 10^9i/10^9c = 1 i/c
   OPC = 4*10^9op/10^9c = 4o/c
b) 4*10^9 i/ 10^9 c = 4 i/c
c) 0.6*10^9+0.4*10^9*2 = 1.4*10^9ciclos
d) IPC = 10^9i/1.4*10^9c = 0.714 i/c
   OPC = 4*10^9o/1.4*10^9c = 2.857 o/c
e) 4/16 = 0.25
f) 0.6*10^9+0.25*0.4*10^9*2+0.75*0.4*10^9 = 1.1 * 10^9 ciclos
g) IPC = 10^9 i / 1.1*10^9c = 0.909 i/c
   OPC = 4*10^9 / 1.1*10^9 c = 3.63 o/c

**6.3**

a) Ganancia máxima = 200/(0.05*200+0.1*200) = 6.67
b) t(N) = 30+170/N +N
c) 0 = 30+170/N + N -> N = 170^(-½) = 13 procesadores
d) Ganancia = 200/(30+26) = 3.57
e) Ganancia = 200/(180+20/10) = 1.1
f) 5 horas
g) Ganancia = 200/(10+26+5) = 4.88
h) MIPS = 648*10^13/(10^6*200*3600) = 9000
   MFLOPS = 72*10^13/ (10^6*200*3600) = 1000
i) MIPS = (648*10^13 +13*10^13)/(10^6*(10+26+5)*3600 = 44783
   MFLOPS = 72*10^13 / (10^6 * (10+26+5)*3600 = 4878
j) PC: 1000 MFLOPS/ 120 w = 8.33 mflops/w
   Supercompu: 4878/(30*10+13*90) = 3.32 MFLOPS/W
k) 4878 MFLOPS / (90*13*26/41 + 90*1*15/41 + 30*10*5/41) = 6 MFLOPS/W
   Ganancia 6/3.32 = 1.81