Yeachan Okh
<div align="center">Homework #1</div>

1.3 The program is compiled in assembly then built in a machine language program

1.4

  A. $1280*1024=1310720*3=3932160$ bytes/frame

  B. $3932160*8/100E6=.31sec$

1.5

  A. P1: $3*10E9/1.5=2E9$

     P2:$2.5*10E9=2.5E9$

     P3:$4*10E9/2.2=1.8E9$

  B. P1: $3*10E9=30E9s$

     P2: $10*2.5E9=25E9s$

     P3: $10*4E9=40E9s$

  C. P1: $30E9/1.5=20E9$

     P2: $25E9$

     P3: $40E9/2.2=18.18E9$

     $f(p1)= 20E9*1.8/7=5.14Ghz$

     $f(p2)= 25E9*1.2/7=4.25Ghz$

     $f(p3)=18.19E9*2.6/7=6.75Ghz$

1.6

  A. P1: $(1E5+2E5*2+5E5*3+2E5*3)/2.5E9=10.4E-4s$

     P2:$(1E5*2+2E5*2+5E5*2+2E5*2)/3E9=6.66E-4s$

     $CPI1=10.4E-4*2.5E9/1E6=2.6$

     $CPi2=6.66E-4*3*1E9/1E6=2$

  B. $p1=1E5+2E5*2+5E5*3+2E5*3=26E3$

     $p2=2E5+2E5*2+5E5*2+2E5*2=20E5$

1.7

  A. CPI-T*f/instr

     a=1.1

     b=1.25

  B. $Fb/fA=(instrB*CPIB)/(instrA*CPIA)=1.37$

  C. $Ta/Tnew=1.67$

     $Tb/Tnew=2.27$

1.11

  1. $CPI=clock*cputime/intr=3E9*750/(2389E9)=.94$

  2. Spec ratio=reftime/exec time=$9650/750=12.86$

  3. If cpi and clock rate dont change cputime iis increased by 10% depending on instructions

  4. $CPU=1.1*instr*1.05*cpi/clock=1.155$ 15.5%

  5. specratio=ref time/cpu=$1/1.15555=.86$

  6. $cpi=700*4*1E9/(.85*2389E9)=1.37$

  7. $4/3=1.33$ clock rate

     4ghz to 3ghz is 1.45 ratio bc of the 15% difference in instruction

  8. $700.750=.933$ 6.7 reduction

9. instr=cpu*clock/cpi=960*.9*4E9/1.61=2146E9
10. Clock rate =instr*cpi/cpi=1/.9clockrate=3.33Ghz
11. clockrate=instr*cpi/cpu=.85/.8=3.18GHZ

1.12

1) $P1 = 5 * 10^9 * 0.9 / 4 * 10^9 = 1.125$ sec, $P2 = 10^9 * 0.75 / (3 * 10^9) = 0.25$ sec
2) $p1 = 2.25 * 3 = 1021$ sec. $P2 = 5 * 0.75 / 3 * 10^9 = 9 * 10^8$
3) $MIPS = 4 * 10^9 * 10^{-6} / 0.9 = 4.44 * 10^3$
   $MIPS2 = 3 * 10^9 * 10^{-6} / 0.75 = 4.0 * 10^3$
4) $p1 = 0.4 * 5 * 10^9 * 10^{-6} / 1.125 = 175 * 10^3$
   $P2 = 0.4 * 10^9 * 10^{-6} / 0.25 = 1.60 * 10^3$