REŠITVE KOLOKVIJ-A:

Naloga 1

a) odmik je lahko 2^{n-1} ali pa $2^{n-1}-1$ za n = 8 je odmik torej lahko128 ali 127

$44 + 128 = 172 = 10101100_{(2)} = AC_{(16)}$
$-56 + 128 = 72 = 01001000_{(2)} = 48_{(16)}$

```
172:2 = 86   ost  0   ▲
 86:2 = 43   ost  0   |
 43:2 = 21   ost  1   |
 21:2 = 10   ost  1   |
 10:2 = 5    ost  0   |
  5:2 = 2    ost  1   |
  2:2 = 1    ost  0   |
  1:2 = 0    ost  1   |
```

b) predstavitev s predznakom in velikostjo

$44 = 00101100_{(2)} = 2C_{(16)}$
$-56 = 10111000_{(2)} = B8_{(16)}$

c) eniški komplement

$44 = 00101100_{(2)} = 2C_{(16)}$
$-56 = 11000111_{(2)} = C7_{(16)}$

$56 = 00111000_{(2)}$ -> zamenjamo 0 in 1 -> 11000111

d) dvojiški komplement

$44 = 00101100_{(2)} = 2C_{(16)}$
$-56 = 11001000_{(2)} = C8_{(16)}$

$56 = 00111000_{(2)}$ -> 11000111 + 1 = 11001000

Vsota

```
    44   00101100(2)
+(-56)   11001000(2)
-------------------
   -12   11110100(2) = F4(16)
```

Naloga 2

a) SISD
b) Enooperandni procesor

Naloga 3

```
MEDPOM   RMB    8
         ...
         LDX    #MEDPOM
         LDAA   #1
ZANKA    STAA   0,X
         INX
         ADDA   #2
         CMPA   #17
         BNE    ZANKA
         ...
```

Naloga 4

a) CPI(P1) = 8*0.3 + 5*0.2 + 6*0.1 + 10*0.35 + 4*0.05 =
= 2.4 + 1.0 + 0.6 + 3.5 + 0.2 = 7.7

$$MIPS(P1) = \frac{f_{CPE}}{CPI(P1)*10^6} = \frac{1200*10^6}{7.7*10^6} = 155.8$$

CPI(P2) = 8*0.35 + 5*0.4 + 6*0.12 + 10*0.1 + 4*0.03 =
= 2.8 + 2.0 + 0.72 + 1 + 0.12 = 6.64

$$MIPS(P2) = \frac{f_{CPE}}{CPI(P1)*10^6} = \frac{1200*10^6}{6.64*10^6} = 180.7$$

b) P2

c) $t_{CPE} = \frac{1}{f_{CPE}} = \frac{1}{1.2*10^9\,Hz} = 0.8\overline{3}*10^{-9}\,s = 0.8\overline{3}\,ns = 833.\overline{3}\,ps$

Naloga 5

B = število prenosov /s * širina vodila = $\frac{frekvenca\_vodila}{ur.per/prenos} * širina\_vodila$

$$B = \frac{66*10^6\,Hz}{2} * 32bit = 33*10^6/s * 4B = 132MB/s$$

REŠITVE KOLOKVIJ-B:

Naloga 1

e) odmik je lahko 2^{n-1} ali pa $2^{n-1}-1$ za n = 8 je odmik torej lahko128 ali 127

$-33 + 128 = 95 = 01011111_{(2)} = 5F_{(16)}$
$55 + 128 = 183 = 10110111_{(2)} = B7_{(16)}$

```
183:2 = 91   ost  1   ▲
 91:2 = 45   ost  1   |
 45:2 = 22   ost  1   |
 22:2 = 11   ost  0   |
 11:2 = 5    ost  1   |
  5:2 = 2    ost  1   |
  2:2 = 1    ost  0   |
  1:2 = 0    ost  1   |
```

f) predstavitev s predznakom in velikostjo

$-33 = 10100001_{(2)} = A1_{(16)}$
$55 = 00110111_{(2)} = 37_{(16)}$

g) eniški komplement

$-33 = 11011110_{(2)} = DE_{(16)}$
$55 = 00110111_{(2)} = 37_{(16)}$

$33 = 00100001_{(2)}$ -> zamenjamo 0 in 1 -> 11011110

h) dvojiški komplement

$-33 = 11011111_{(2)} = DF_{(16)}$
$55 = 00110111_{(2)} = 37_{(16)}$

$33 = 00100001_{(2)}$ -> 11011110 + 1 = 11011111

Vsota

$$\begin{array}{rr} (-33) & 11011111_{(2)} \\ + \;\; 55 & 00110111_{(2)} \\ \hline 22 & 00010110_{(2)} = 16_{(16)} \end{array}$$

Naloga 2

```
TABELA   RMB    8
         ...
         LDX    #TABELA
         LDAA   #2
ZANKA    STAA   0,X
         INX
         ADDA   #2
         CMPA   #18
         BNE    ZANKA
         ...
```

Naloga 3

B = število prenosov /s * širina vodila = $\frac{frekvenca\_vodila}{ur.per/prenos} * širina\_vodila$

$$B = \frac{66*10^6\,Hz}{2} * 64bit = 33*10^6/s * 8B = 264MB/s$$

Naloga 4

d) CPI(P1)= 6*0.3 + 4*0.2 + 5*0.1 + 8*0.35 + 3*0.05 =
= 1.8 + 0.8 + 0.5 + 2.8 + 0.15 = 6.05

$$MIPS(P1) = \frac{f_{CPE}}{CPI(P1)*10^6} = \frac{1250*10^6}{6.05*10^6} = 206.6$$

CPI(P2)= 6*0.35 + 4*0.4 + 5*0.12 + 8*0.1 + 3*0.03 =
= 2.1 + 1.6 + 0.6 + 0.8 + 0.09 = 5.19

$$MIPS(P2) = \frac{f_{CPE}}{CPI(P1)*10^6} = \frac{1250*10^6}{5.19*10^6} = 240.8$$

e) P2

f) $t_{CPE} = \frac{1}{f_{CPE}} = \frac{1}{1.25*10^9\,Hz} = 0.8*10^{-9}\,s = 0.8ns = 800\,ps$

Naloga 5

c) SISD
d) Enooperandni procesor