

|      |                                                               |                                                              |                                                                 |                                                              |                                                        |                                         |
|------|---------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------|-----------------------------------------|
| 2.1  | a)<br>45                                                      | b)<br>55                                                     | c)<br>21                                                        | d)<br>5,375                                                  | e)<br>6,875                                            | f)<br>5,625                             |
| 2.2  | a)<br>187                                                     | b)<br>401                                                    | c)<br>12,453125                                                 | d)<br>62,53125                                               |                                                        |                                         |
| 2.3  | a)<br>707                                                     | b)<br>57845                                                  | c)<br>26,55859375                                               | d)<br>179,828125                                             |                                                        |                                         |
| 2.4  | a)<br>(133) <sub>8</sub>                                      | b)<br>(252) <sub>8</sub>                                     | c)<br>(15.3) <sub>8</sub>                                       | d)<br>(2.2) <sub>8</sub>                                     |                                                        |                                         |
| 2.5  | a)<br>(AA) <sub>16</sub>                                      | b)<br>(1B.9) <sub>16</sub>                                   | c)<br>(15.C) <sub>16</sub>                                      |                                                              |                                                        |                                         |
| 2.6  | a)<br>(10111) <sub>2</sub>                                    | b)<br>(101101) <sub>2</sub>                                  | c)<br>(1111010.0010111) <sub>2</sub>                            | d)<br>(1010111.1010011) <sub>2</sub>                         |                                                        |                                         |
| 2.7  | a)<br>(1163) <sub>8</sub>                                     | b)<br>(5566) <sub>8</sub>                                    | c)<br>(124.15341) <sub>8</sub>                                  | d)<br>(531.52703) <sub>8</sub>                               |                                                        |                                         |
| 2.8  | a)<br>(D7) <sub>16</sub>                                      | b)<br>(1B5) <sub>16</sub>                                    | c)<br>(13.5EC) <sub>16</sub>                                    | d)<br>(84.6E1) <sub>16</sub>                                 |                                                        |                                         |
| 2.9  | a)<br>(3375.3552) <sub>8</sub>                                | b)<br>(2461.4653) <sub>8</sub>                               | c)<br>(67.0514) <sub>8</sub>                                    | d)<br>(5274.0443) <sub>8</sub>                               |                                                        |                                         |
| 2.10 | a)<br>(ED5.716) <sub>16</sub>                                 | b)<br>(2E.EC8) <sub>16</sub>                                 | c)<br>(CA.EA8) <sub>16</sub>                                    | d)<br>(5C.B88) <sub>16</sub>                                 |                                                        |                                         |
| 2.11 | a) 7 bitar                                                    | 2 <sup>6</sup> < 360/5 < 2 <sup>7</sup>                      |                                                                 | 2.12                                                         | a) 7 bitar                                             | 2 <sup>6</sup> < 360/5 < 2 <sup>7</sup> |
|      | b) 1000000<br>1000001<br>1000010<br>1000011<br>1000100        |                                                              |                                                                 |                                                              | b) 0000000<br>0000001<br>0000011<br>0000010<br>0000110 |                                         |
| 2.13 | (0101 0110 0011 . 0111 1000 0010) <sub>NBCD</sub>             |                                                              |                                                                 |                                                              |                                                        |                                         |
| 2.14 | (8752,95) <sub>10</sub>                                       |                                                              |                                                                 |                                                              |                                                        |                                         |
| 2.15 | a)<br>10 bitar                                                | (2 <sup>9</sup> < 1000 < 2 <sup>10</sup> )                   |                                                                 | b)<br>12 bitar                                               | (3 x 4 bitar)                                          |                                         |
| 2.16 | a)<br>(3,7835) <sub>10</sub> ·10 <sup>2</sup>                 | b)<br>(7,693) <sub>10</sub> ·10 <sup>-3</sup>                | c)<br>(3.7ABC12) <sub>16</sub> ·16 <sup>(3)</sup> <sub>16</sub> |                                                              |                                                        |                                         |
|      | d)<br>(1.011011) <sub>2</sub> ·2 <sup>(11)</sup> <sub>2</sub> | e)<br>(1.11) <sub>2</sub> ·2 <sup>(-11)</sup> <sub>2</sub>   |                                                                 |                                                              |                                                        |                                         |
| 2.17 | a)<br>(1.0111) <sub>2</sub> ·2 <sup>(100)</sup> <sub>2</sub>  | b)<br>(1.0011) <sub>2</sub> ·2 <sup>(101)</sup> <sub>2</sub> | c)<br>(1.0111) <sub>2</sub> ·2 <sup>(-11)</sup> <sub>2</sub>    | d)<br>(1.0110) <sub>2</sub> ·2 <sup>(110)</sup> <sub>2</sub> |                                                        |                                         |

|                            |                            |                             |                            |
|----------------------------|----------------------------|-----------------------------|----------------------------|
| <b>2.18 a)</b>             | <b>b)</b>                  | <b>c)</b>                   | <b>d)</b>                  |
| $(1.70)_{16}16^{(1)_{16}}$ | $(2.5A)_{16}16^{(1)_{16}}$ | $(2.E1)_{16}16^{(-1)_{16}}$ | $(5.7A)_{16}16^{(1)_{16}}$ |

|                                  |                                  |                                   |
|----------------------------------|----------------------------------|-----------------------------------|
| <b>2.19 a)</b>                   | <b>b)</b>                        | <b>c)</b>                         |
| $(0001.0111)_2 \cdot 16^{(1)_2}$ | $(0010.0110)_2 \cdot 16^{(1)_2}$ | $(0010.1110)_2 \cdot 16^{(-1)_2}$ |
| <b>d)</b>                        |                                  |                                   |
| $(0101.1000)_2 \cdot 16^{(1)_2}$ |                                  |                                   |

|                |                |                |                |
|----------------|----------------|----------------|----------------|
| <b>2.20 a)</b> | <b>b)</b>      | <b>c)</b>      | <b>d)</b>      |
| $(100/0111)_2$ | $(101/0011)_2$ | $(-11/0111)_2$ | $(110/0110)_2$ |

|                 |                 |                 |                 |
|-----------------|-----------------|-----------------|-----------------|
| <b>2.21 a)</b>  | <b>b)</b>       | <b>c)</b>       | <b>d)</b>       |
| $(1100/0111)_2$ | $(1101/0011)_2$ | $(0101/0111)_2$ | $(1110/0110)_2$ |

|                 |                 |                 |                 |
|-----------------|-----------------|-----------------|-----------------|
| <b>2.22 a)</b>  | <b>b)</b>       | <b>c)</b>       | <b>d)</b>       |
| $(1011/0111)_2$ | $(1100/0011)_2$ | $(0100/0111)_2$ | $(1101/0110)_2$ |

**2.23** Talområdet  $1 \cdot 10^{-100} < N_{10} < 1 \cdot 10^{100}$  svara mot  $1 \cdot 2^x < N_{10} < 1 \cdot 2^y$   
vilket ger  $-x = y = 100/\log 2 = 332,2$

Exponentområdet är således bipolärt och skall minst ha  $333+1+332 = 666$  kvantiseringssteg.

Exponenten skall ha 10 bitar ty  $2^9 < 666 < 2^{10}$

Om antalet siffror i den decimala mantissan är 7 så bestäms antalet siffror n i den binära mantissan ur  $2^n = 10^7$  vilket ger  $n = 7/\log 2 = 23,25$ , dvs 24 siffror

|                |                                           |           |                                           |
|----------------|-------------------------------------------|-----------|-------------------------------------------|
| <b>2.24 a)</b> | $(1/10000011/011100000000000000000000)_2$ | <b>b)</b> | $(0/10000100/001011000000000000000000)_2$ |
| <b>c)</b>      | $(0/01111100/011100000000000000000000)_2$ | <b>d)</b> | $(1/10000101/010111101000000000000000)_2$ |

|                |                                           |
|----------------|-------------------------------------------|
| <b>2.25 a)</b> | $(0/00000000/000000000000000000000000)_2$ |
| <b>b)</b>      | $(1/11111111/000000000000000000000000)_2$ |

**2.26** "Heja Emil"

|             |          |                |           |           |    |
|-------------|----------|----------------|-----------|-----------|----|
| <b>2.27</b> | 100 1000 | <b>2.28 a)</b> | 1100 1000 | <b>b)</b> | C8 |
|             | 100 0001 |                | 1100 0001 |           | C1 |
|             | 100 0011 |                | 0100 0011 |           | 43 |
|             | 100 1011 |                | 1100 1011 |           | CB |
|             | 100 0101 |                | 0100 0101 |           | 45 |
|             | 010 0000 |                | 0010 0000 |           | 20 |
|             | 101 1011 |                | 0101 1011 |           | 5B |
|             | 101 0010 |                | 0101 0010 |           | 52 |
|             | 010 0000 |                | 0010 0000 |           | 20 |
|             | 100 0010 |                | 1100 0010 |           | C2 |
|             | 101 1011 |                | 0101 1011 |           | 5B |
|             | 101 0011 |                | 1101 0011 |           | D3 |
|             | 101 0100 |                | 0101 0100 |           | 54 |
|             | 010 0001 |                | 1010 0001 |           | A1 |

**2.29** Studentens egen lösning skall diskuteras!