# Inämningsuppgift 1

## A.4

1.a) $1984_{10}$ till binärt

$1984_{10}$ mod 2 = 0
$1984_{10}$ / 2 = $992_{10}$

$992_{10}$ mod 2 = 0
$992_{10}$ / 2 = $496_{10}$

$496_{10}$ mod 2 = 0
$496_{10}$ / 2 = $248_{10}$

$248_{10}$ mod 2 = 0
$248_{10}$ / 2 = $124_{10}$

$124_{10}$ mod 2 = 0
$124_{10}$ / 2 = $62_{10}$

$62_{10}$ mod 2 = 0
$62_{10}$ / 2 = $31_{10}$

$31_{10}$ mod 2 = 1
$31_{10}$ / 2 = $15_{10}$

$15_{10}$ mod 2 = 1
$15_{10}$ / 2 = $7_{10}$

$7_{10}$ mod 2 = 1
$7_{10}$ / 2 = $3_{10}$

$3_{10}$ mod 2 = 1
$3_{10}$ / 2 = $1_{10}$

$1_{10}$ mod 2 = 1
$2_{10}$ / 2 = $0_{10}$

Svar: $11111000000_2$

1.b) $4000_{10}$ till binär

$4000_{10}$ mod 2 = 0
$4000_{10}$ / 2 = $2000_{10}$

$2000_{10}$ mod 2 = 0
$2000_{10}$ / 2 = $1000_{10}$

$1000_{10}$ mod 2 = 0
$1000_{10}$ / 2 = $500_{10}$

$500_{10}$ mod 2 = 0
$500_{10}$ / 2 = $250_{10}$

$250_{10}$ mod 2 = 0
$250_{10}$ / 2 = $125_{10}$

$125_{10}$ mod 2 = 1
$125_{10}$ / 2 = $62_{10}$

$124_{10}$ mod 2 = 0
$124_{10}$ / 2 = $31_{10}$

$31_{10}$ mod 2 = 1
$31_{10}$ / 2 = $15_{10}$

$15_{10}$ mod 2 = 1
$15_{10}$ / 2 = $7_{10}$

$7_{10}$ mod 2 = 1
$7_{10}$ / 2 = $3_{10}$

$3_{10}$ mod 2 = 1
$3_{10}$ / 2 = $1_{10}$

$1_{10}$ mod 2 = 1
$1_{10}$ / 2 = $0_{10}$

Svar: $111110100000_2$

1.c) $8192_{10}$ till binärt

$8192_{10}$ mod 2 = 0
$8192_{10}$ / 2 = $5096_{10}$

$4092_{10}$ mod 2 = 0
$4092_{10}$ / 2 = $2048_{10}$

$2048_{10}$ mod 2 = 0
$2048_{10}$ / 2 = $1024_{10}$

$1024_{10}$ mod 2 = 0
$1024_{10}$ / 2 = $512_{10}$

$512_{10}$ mod 2 = 0
$512_{10}$ / 2 = $256_{10}$

$256_{10}$ mod 2 = 0
$256_{10}$ / 2 = $128_{10}$

$128_{10}$ mod 2 = 0
$128_{10}$ / 2 = $64_{10}$

$64_{10}$ mod 2 = 0
$64_{10}$ / 2 = $32_{10}$

$32_{10}$ mod 2 = 0
$31_{10}$ / 2 = $16_{10}$

$16_{10}$ mod 2 = 0
$16_{10}$ / 2 = $8_{10}$

$8_{10}$ mod 2 = 0
$8_{10}$ / 2 = $4_{10}$

$4_{10}$ mod 2 = 0
$4_{10}$ / 2 = $2_{10}$

$2_{10}$ mod 2 = 0
$2_{10}$ / 2 = $1_{10}$

$1_{10}$ mod 2 = 1
$1_{10}$ / $2_{10}$ = 0

Svar: $10000000000000_2$

2.a) $1001101001 = 1 + 8 + 32 + 64 + 512 = 617_{10}$

b) $0010\ 0110\ 1001 = 269_{16}$
2 6 9

3) Giltiga hexadecimaltalsnotationer: BED, CAB, DEAD, DECADE, ACCEDED, DAD

$BED_{16} = 11 \cdot 16^2 + 14 \cdot 16^1 + 13 \cdot 16^0 = 3501_{10}$

$CAB_{16} = 12 \cdot 16^2 + 10 \cdot 16^1 + 11 \cdot 16^0 = 3243_{10}$

$DEAD_{16} = 13 \cdot 16^3 + 14 \cdot 16^2 + 10 \cdot 16^1 + 16 \cdot 16^0 = 57005_{10}$

$DECADE_{16} = 13 \cdot 16^5 + 14 \cdot 16^4 + 12 \cdot 16^3 + 10 \cdot 16^2 + 13 \cdot 16^1 + 14 \cdot 16^0 = 14600926_{10}$

$ACCEDED_{16} = 10 \cdot 16^6 + 12 \cdot 16^5 + 12 \cdot 16^4 + 14 \cdot 16^3 + 13 \cdot 16^2 + 14 \cdot 16^1 + 13 \cdot 16^0 = 181202413_{10}$

$DAD_{16} = 13 \cdot 16^2 + 10 \cdot 16^1 + 13 \cdot 16^0 = 3501_{10}$

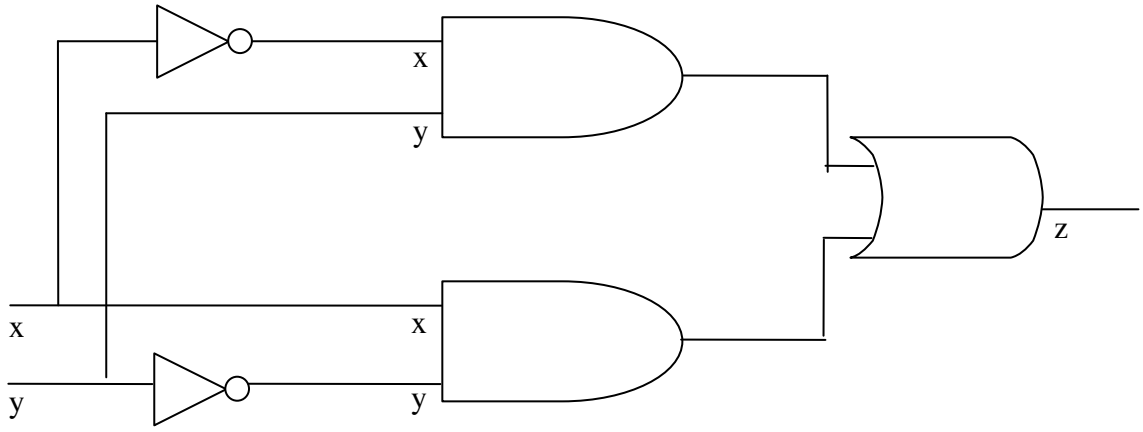
**B.5**

1.

| x | y | z |
|---|---|---|
| 1 | 1 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 0 | 0 | 0 |

2. $(x \wedge \overline{y}) \vee (\overline{x} \wedge y)$

3.




4. $(\overline{x \vee y}) = \overline{x} \wedge \overline{y}$

| x | y | $(\overline{x \vee y})$ | $\overline{x} \wedge \overline{y}$ |
|---|---|---|---|
| 0 | 0 | 1 | 1 |
| 0 | 1 | 0 | 0 |
| 1 | 0 | 0 | 0 |
| 1 | 1 | 0 | 0 |

$(\overline{x \wedge y}) = \overline{x} \vee \overline{y}$

| x | y | $(\overline{x \wedge y})$ | $\overline{x} \vee \overline{y}$ |
|---|---|---|---|
| 0 | 0 | 1 | 1 |
| 0 | 1 | 1 | 1 |
| 1 | 0 | 1 | 1 |
| 1 | 1 | 0 | 0 |

V.S.V

5.

| a | b | c | d | **U** |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | **1** |
| 0 | 0 | 0 | 1 | **0** |
| 0 | 0 | 1 | 0 | **0** |
| 0 | 0 | 1 | 1 | **1** |
| 0 | 1 | 0 | 0 | **0** |
| 0 | 1 | 0 | 1 | **1** |
| 0 | 1 | 1 | 0 | **1** |
| 0 | 1 | 1 | 1 | **0** |
| 1 | 0 | 0 | 0 | **0** |
| 1 | 0 | 0 | 1 | **1** |
| 1 | 0 | 1 | 0 | **1** |
| 1 | 0 | 1 | 1 | **0** |
| 1 | 1 | 0 | 0 | **1** |
| 1 | 1 | 0 | 1 | **0** |
| 1 | 1 | 1 | 0 | **0** |
| 1 | 1 | 1 | 1 | **1** |