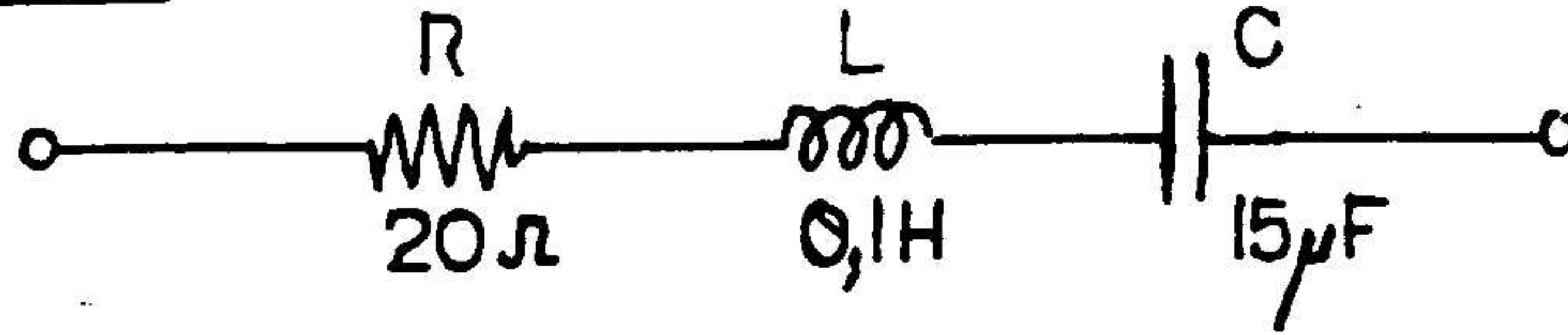


POSSIBLE ANSWERS FOR:

VRAAG / QUEST. 1



$$X_C = \frac{1}{2\pi f C} \quad \checkmark$$

$$= \frac{1}{2 \times \pi \times 100 \times (15 \times 10^{-6})}$$

$$= \frac{1}{2 \times \pi \times 0,01} \quad \checkmark$$

$$= \frac{1}{0,06}$$

$$= 16,67 \Omega \longrightarrow \checkmark \quad (3)$$

$$X_L = 2\pi f L \quad \checkmark$$

$$= 2 \times \pi \times 100 \times 0,1 \quad \checkmark$$

$$= 62,83 \Omega \longrightarrow \checkmark$$

$V = 100V$
 $f = 100 Hz$

$$Z = \sqrt{R^2 + (X_L - X_C)^2} \quad \checkmark$$

$$= \sqrt{(20)^2 + (62,83 - 16,67)^2}$$

$$= \sqrt{(20)^2 + (46,16)^2} \quad \checkmark$$

$$= \sqrt{400 + 2,130,75}$$

$$= 50,31 \Omega \longrightarrow \checkmark \quad (3)$$

$$1.1.2. \quad \bar{I}_T = \frac{V_T}{Z} \quad \checkmark$$

$$= \frac{100V}{50,31 \Omega} \quad \checkmark$$

$$= 1,99 \text{ Amp.} \longrightarrow \checkmark \quad (3)$$

$$\begin{aligned}
 1.1.1. \quad V_R &= I_T \times R \quad \checkmark \\
 &= 1,99 \text{ A} \times 20 \Omega \quad \checkmark \\
 &= 39,80 \text{ Volt} \quad \checkmark \longrightarrow \quad (3)
 \end{aligned}$$

$$\begin{aligned}
 V_L &= I_T \times X_L \quad \checkmark \\
 &= 1,99 \text{ A} \times 62,83 \Omega \quad \checkmark \\
 &= 125,03 \text{ Volt} \quad \checkmark \longrightarrow \quad (3)
 \end{aligned}$$

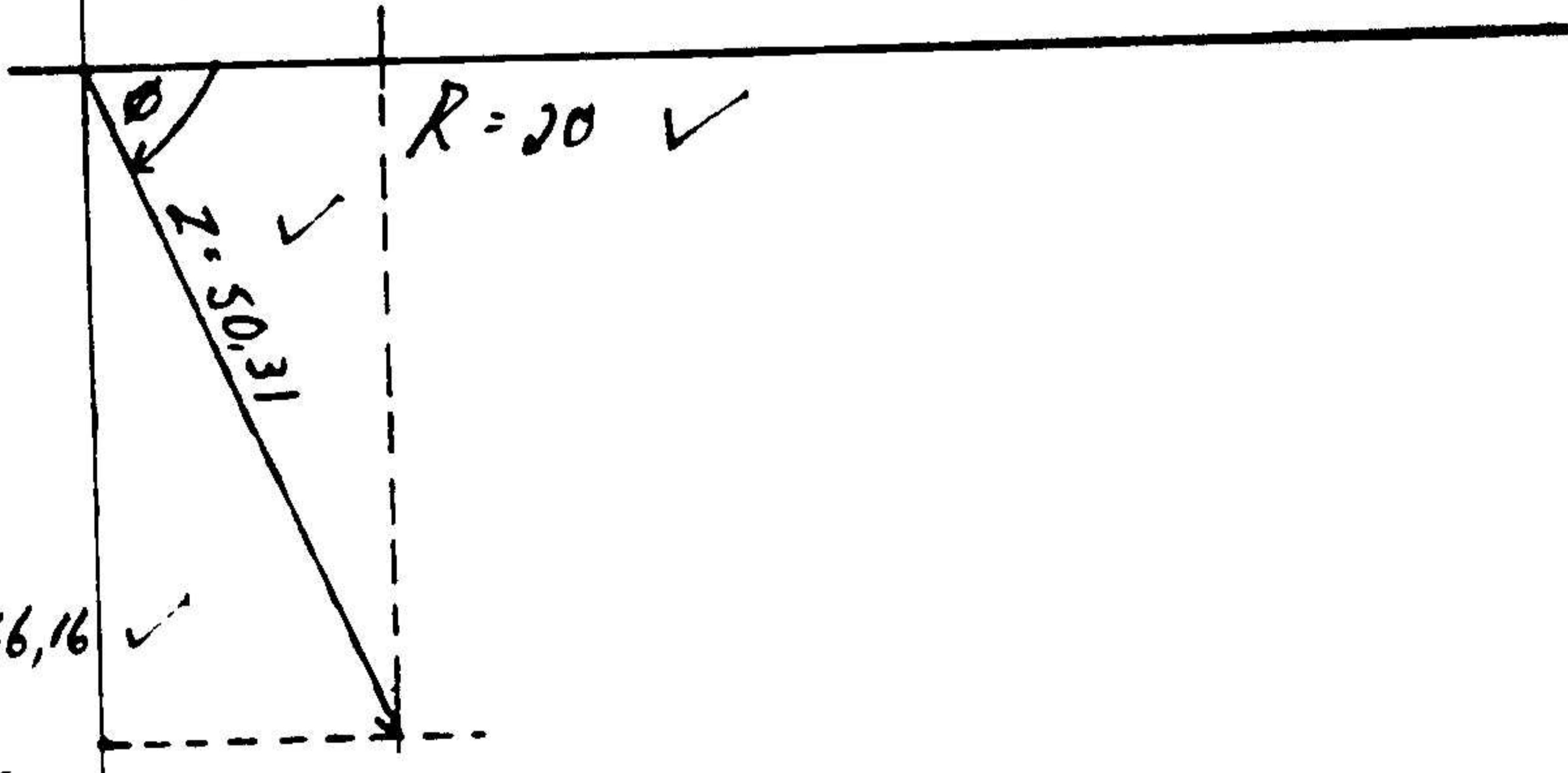
$$\begin{aligned}
 V_C &= I_T \times X_C \quad \checkmark \\
 &= 1,99 \text{ A} \times 16,67 \Omega \quad \checkmark \\
 &= 33,17 \text{ Volt} \quad \checkmark \longrightarrow \quad (3)
 \end{aligned}$$

1.1.3

FASOR DIAGRAM / FASOR DIAGRAM

$$X_C = 16,67 \quad \checkmark$$

(5)



$$X_L - X_C = 46,16 \quad \checkmark$$

$$X_L = 62,83 \quad \checkmark$$

$$\begin{aligned}
 \cos \theta &= \frac{a}{s} \quad \checkmark \\
 &= \frac{20}{50,31} \quad \checkmark \\
 &= 0,40
 \end{aligned}$$

$$\begin{aligned}
 \theta &= \cos^{-1} 0,40 \quad \checkmark \\
 &= 66,42^\circ \quad \checkmark \longrightarrow \quad (3)
 \end{aligned}$$

12. $C = \frac{1}{(f_r \times 2 \times \pi)^2 L}$ ✓

$= \frac{1}{(500 \times 10^3)^2 \times 2 \times \pi^2 \times 10 \times 10^{-6}}$ ✓

$= 10 \times 10^{-9} \text{ F}$ ✓

$= 10 \text{ nF} \longrightarrow$ ✓ (3)

$C = \frac{1}{(f_r \times 2 \times \pi)^2 L}$ ✓

$= \frac{1}{(1 \times 10^6)^2 \times 2 \times \pi^2 \times 10 \times 10^{-6}}$ ✓

$= 2,53 \times 10^{-9} \text{ F}$ ✓

$= 2,53 \text{ nF} \longrightarrow$ ✓ (3)

VERSTELBARE KAPASITOR / VARIABLE CAPACITOR = TUSSEN / BETWEEN 2,53 nF ✓

13. $X_L = 2\pi f L$ ✓

$= 2 \times \pi \times (10 \times 10^3) \times (0,1 \times 10^{-3})$ ✓

$= 6,28 \mu \longrightarrow$ ✓ (3)

$\phi = \frac{X_L}{R}$ ✓

$= \frac{6,28 \mu}{8 \mu}$ ✓

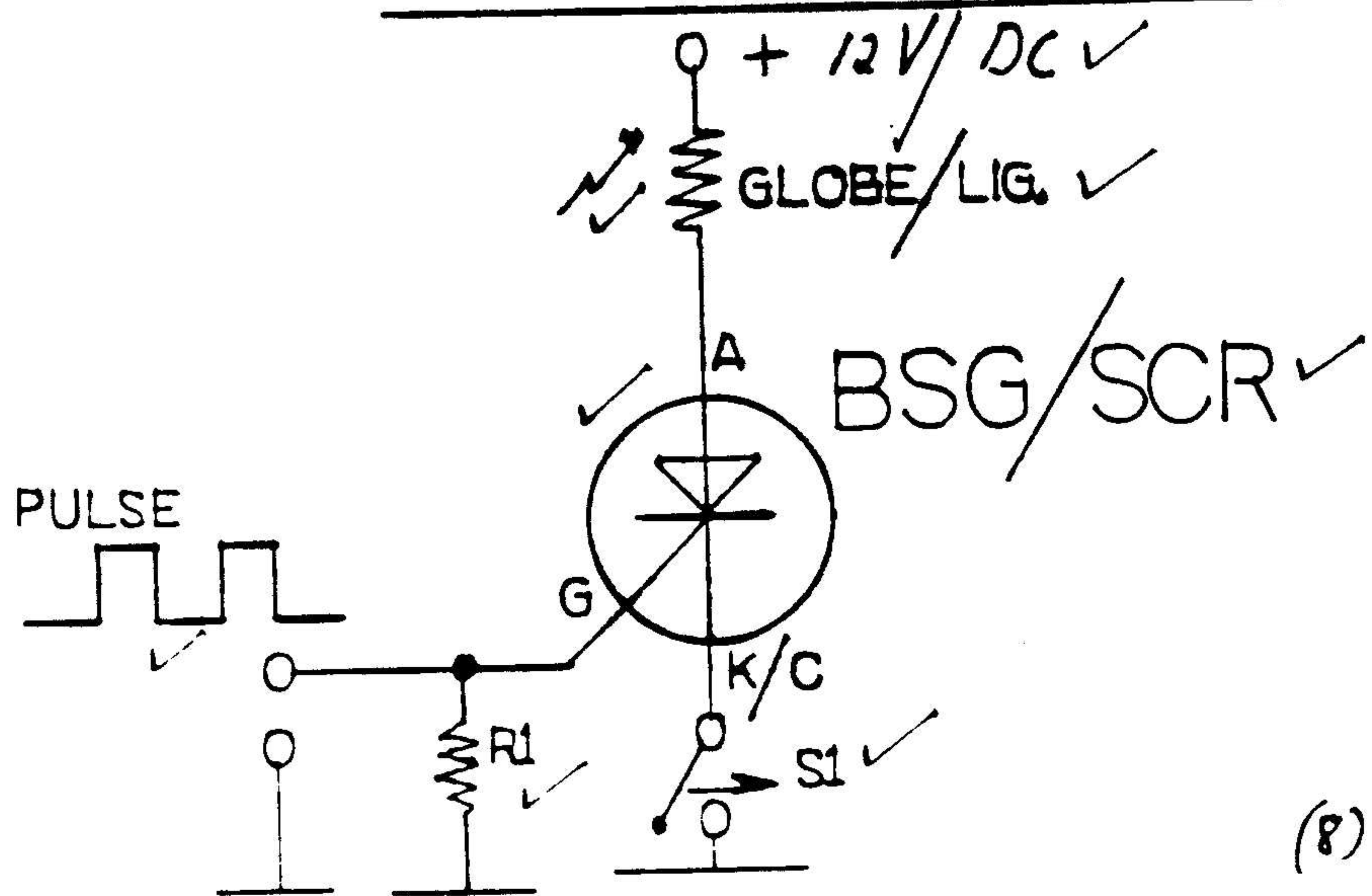
$= 0,79 \longrightarrow$ ✓ (3)

VRAAG 2 / QUEST. 2

- 2.1.1. NPN-TRANSISTOR. ✓
- 2.1.2. NORMAL DIODE / DIODE ✓
- 2.1.3. VERSTERBARE WEERSTAND / VARIABLE RESISTOR. ✓
- 2.1.4. WEERSTAND / RESISTOR ✓
- 2.1.5. INDUKTOR / COIL ✓
- 2.1.6. ELEKTROLYTIESE KAPASITOR / ELECTROLYTIC CAPASITOR. ✓ (6)

- 2.2. { DIE ANODE MOET POSITIEF T.O.V. DIE KATHODE WEES. ✓
 { THE ANODE MUST BE POSITIVE AND THE KATHODE NEGATIVE ✓
 { DAAR MOET 'N POSITIEWE PULS OP DIE HEK AANGELE' WORD ✓
 { A POSITIVE PULSE MUST BE FEED TO THE GATE ✓
 { DIE HOUSTROOM MOET GROOT GENOEG WEES. ✓
 { THE HOLDING-CURRENT MUST BE BIG ENOUGH. ✓
 { DIE λ MOET ONDERBREEK WORD OM DIE B.S.G. AF TE SKAKEL ✓
 { THE HOLDING-CURRENT MUST BE CUT OFF TO STOP THE P.C.R. CONDU ✓ (8)

2.3.

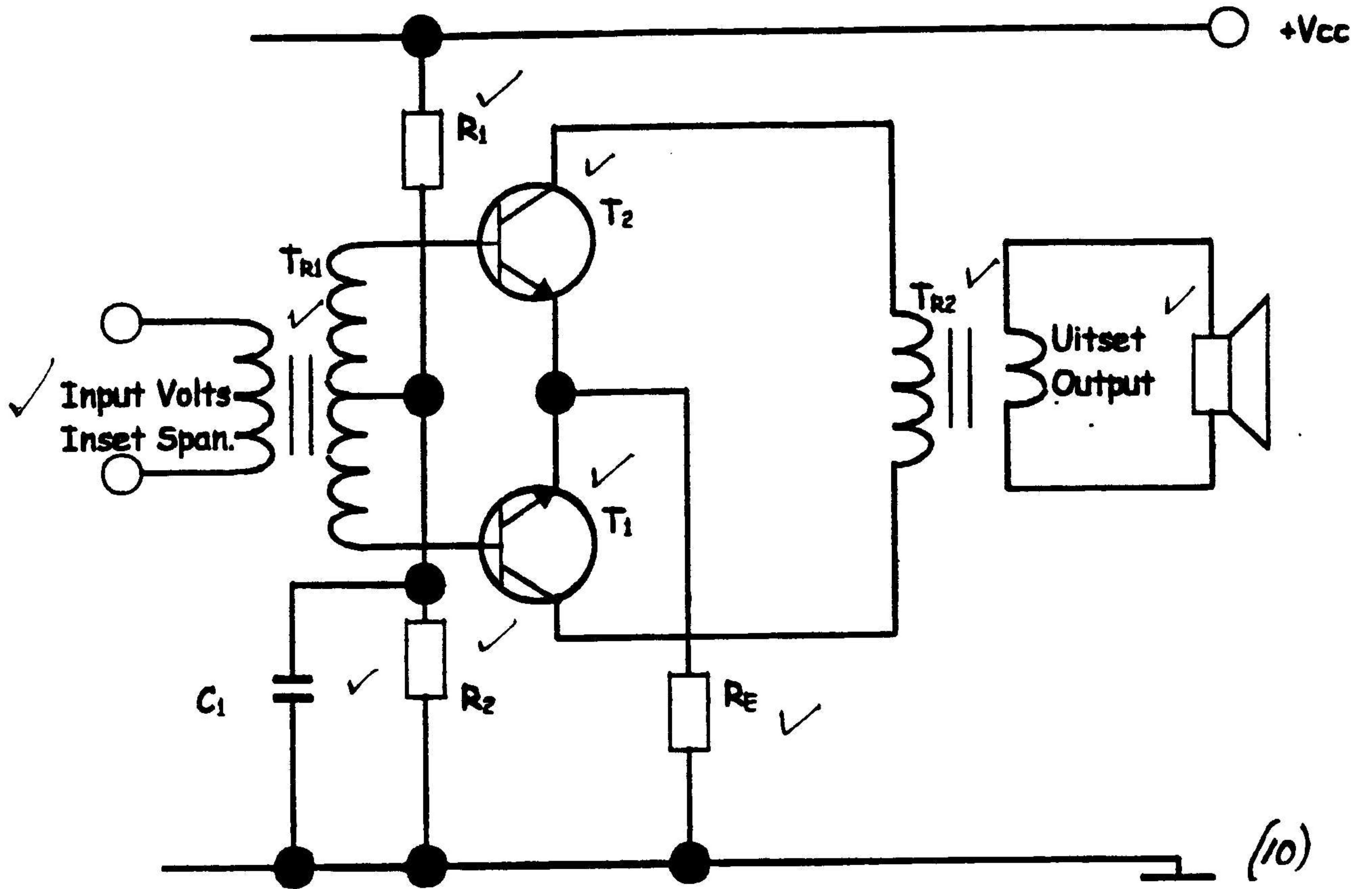


- 2.4.
- | | |
|-----------------------|-------------------------|
| 0 - SWART / BLACK ✓ | 7 - PERS / PURPLE ✓ |
| 1 - BRUEN / BROWN ✓ | 8 - GRYS / GRAY ✓ |
| 2 - ROOI / RED ✓ | 9 - WIT / WHITE ✓ |
| 3 - ORANJE / ORANGE ✓ | 5% = GOED. / GOLD ✓ |
| 4 - GEEL / YELLOW ✓ | 10% = SILWER / SILVER ✓ |
| 5 - GROEN / GREEN ✓ | |
| 6 - BLOU / BLUE ✓ | |

(12)

VRAAG 3 / QUEST. 3

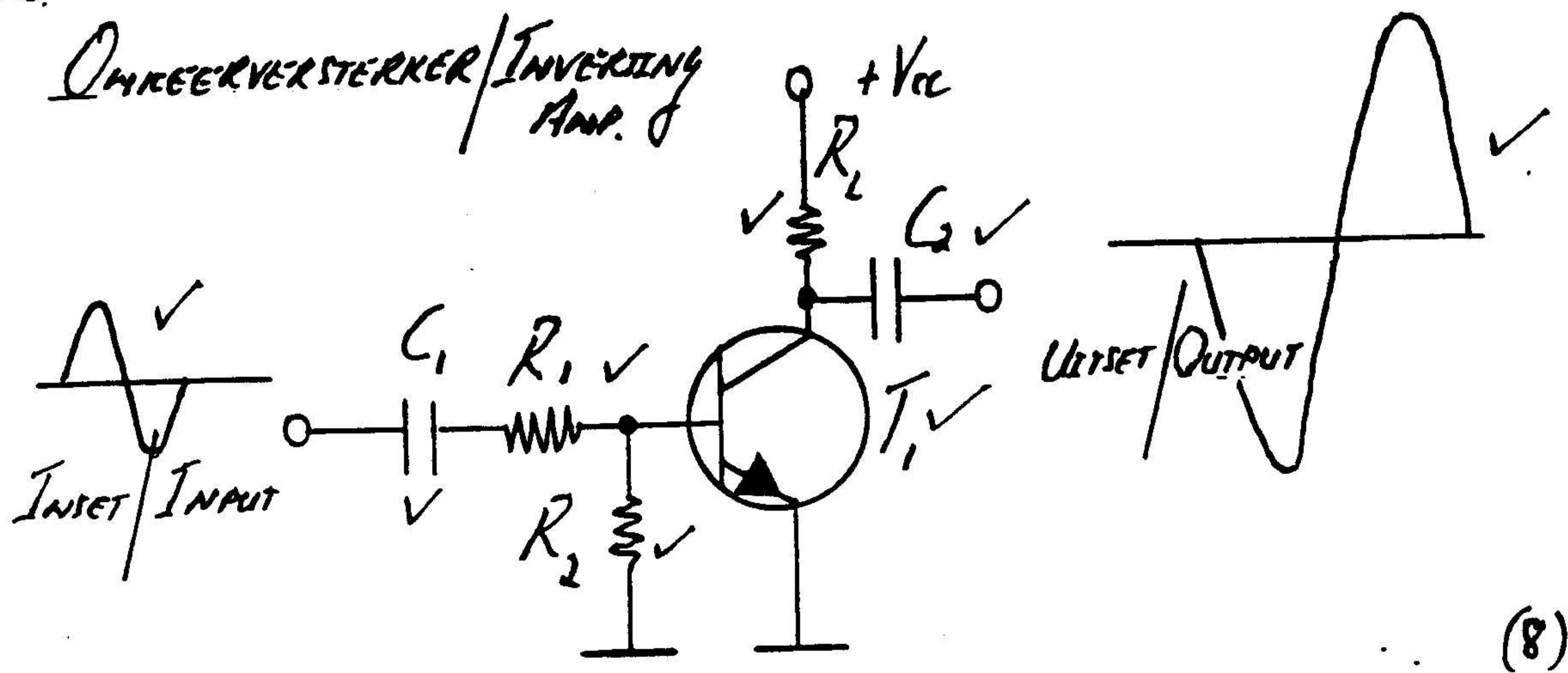
3.1



(10)

3.2

OMKEERVERSTERKER / INVERTING AMP.

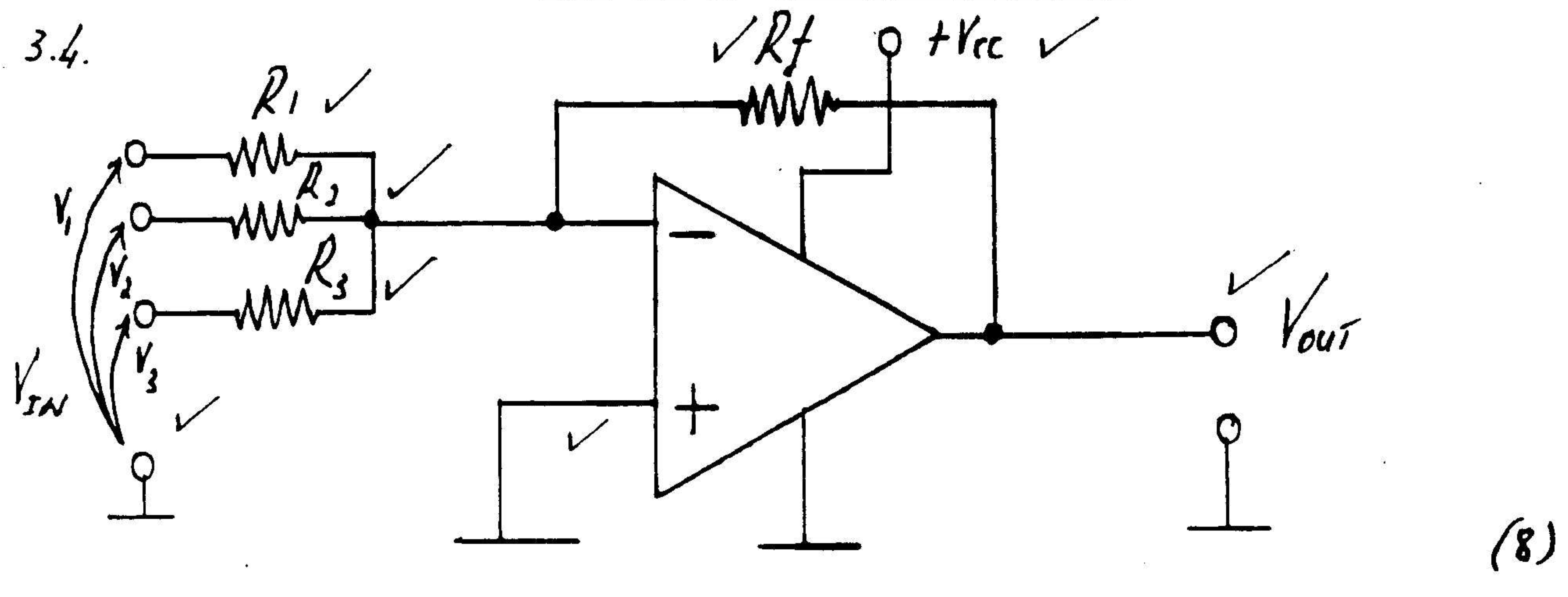
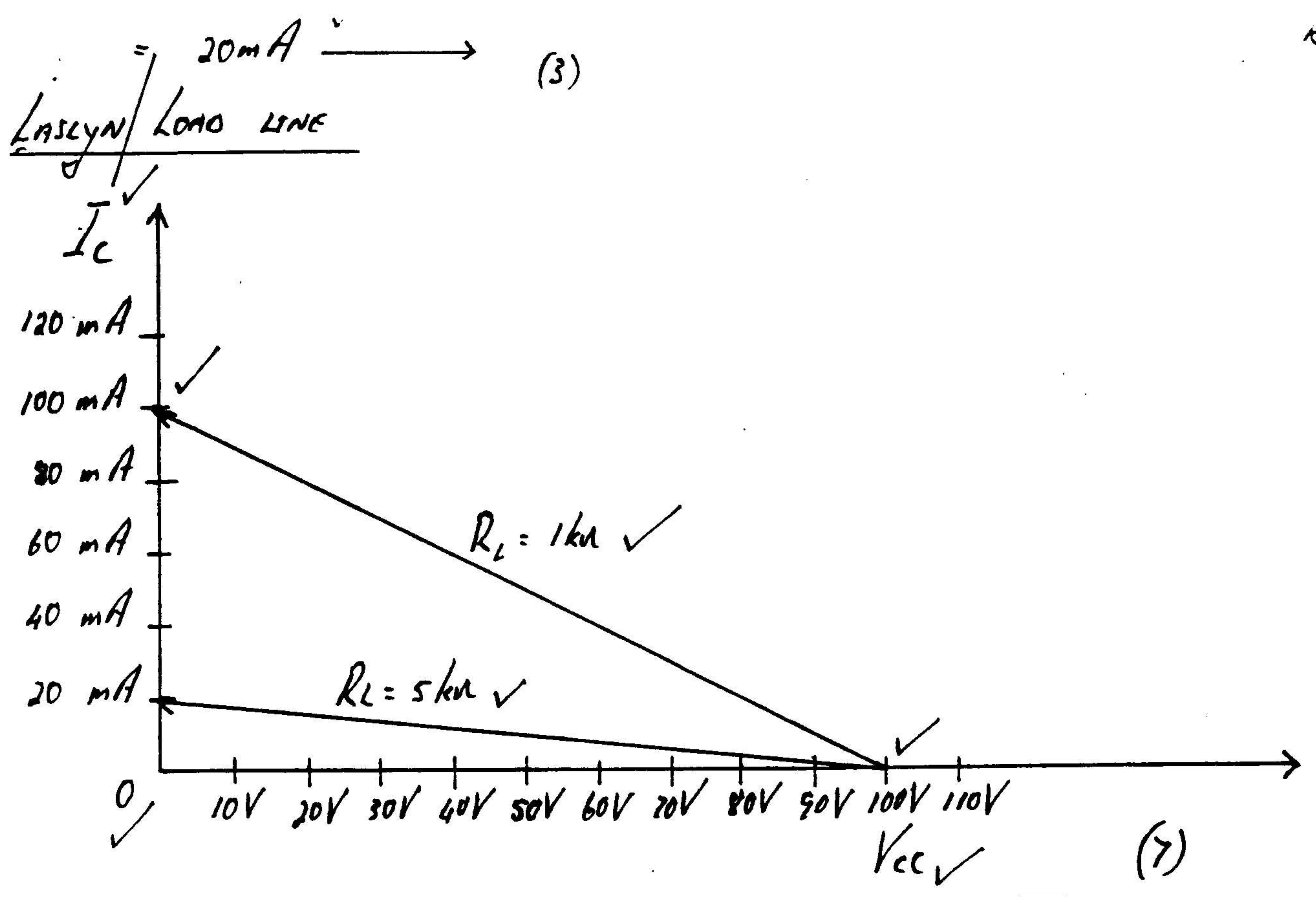


(8)

3.3. (a) $V_{CE} = V_{CC}$ ✓
 $\therefore V_{CE} = 100V \rightarrow$ (2)

(b) $I_{C(max)} = \frac{V_{CC}}{R_C (R_L)}$ ✓
 $= \frac{100V}{1k\Omega}$ ✓
 $= 100mA \rightarrow$ (3)

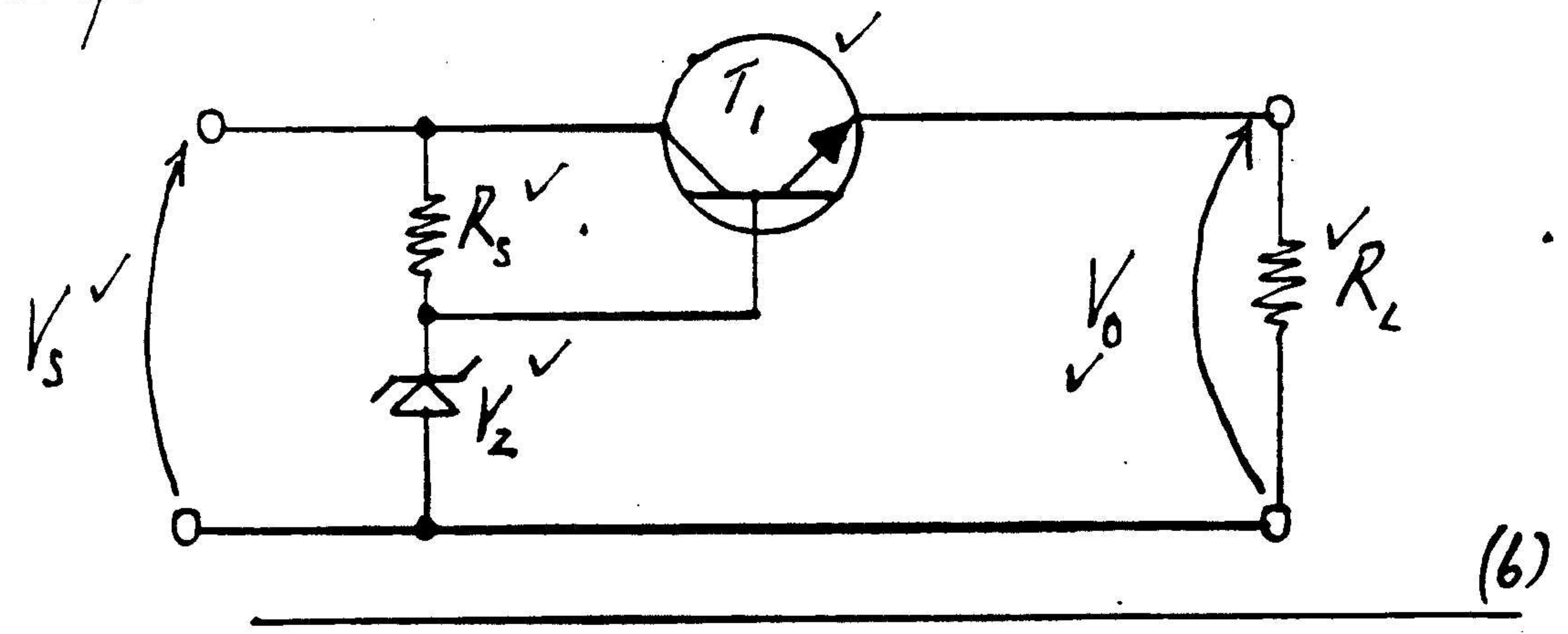
(c) $I_{C(max)} = \frac{V_{CC}}{R_C (R_L)}$
 $= \frac{100V}{5k\Omega}$



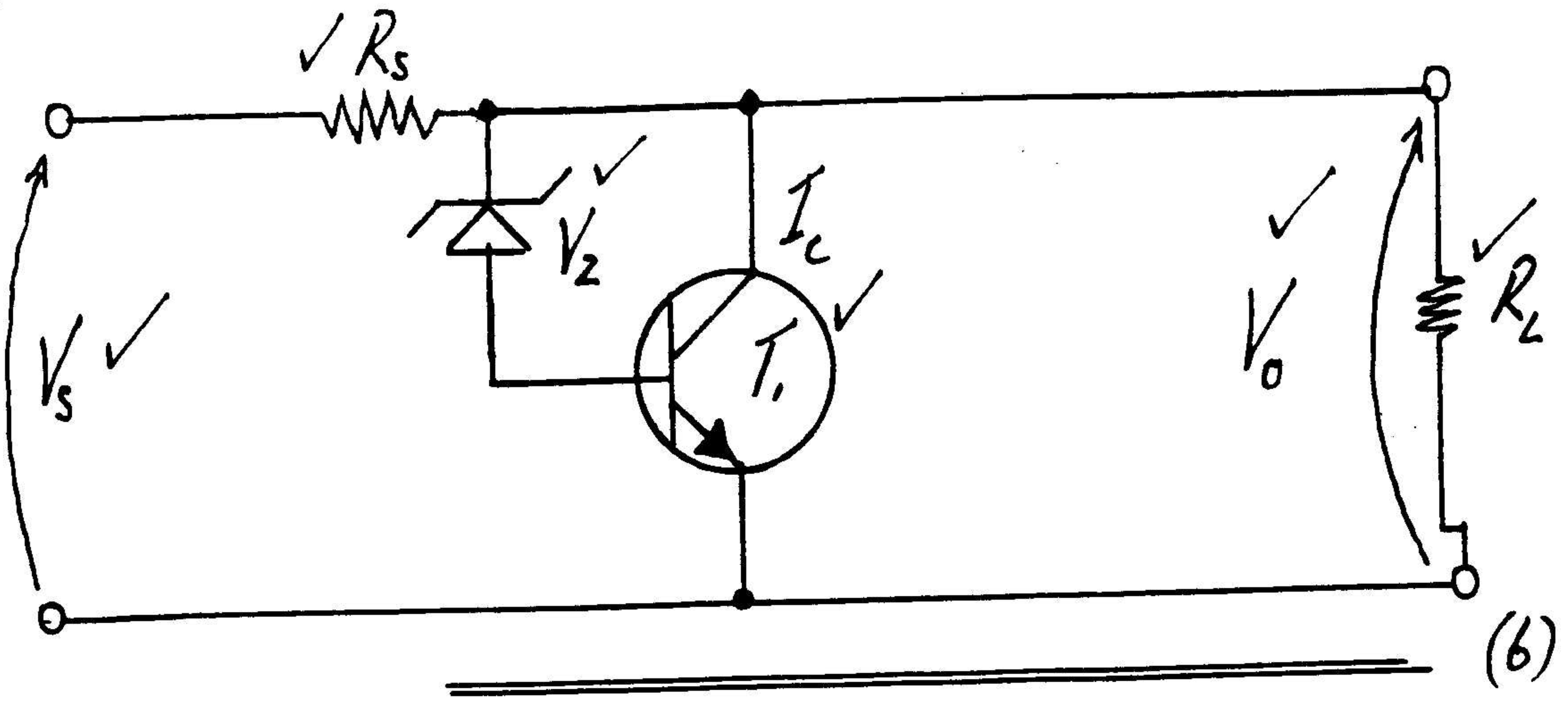
3.5. KLANKMENGENERS/SOUND MIXERS

VRAAG 4/QUEST. 4

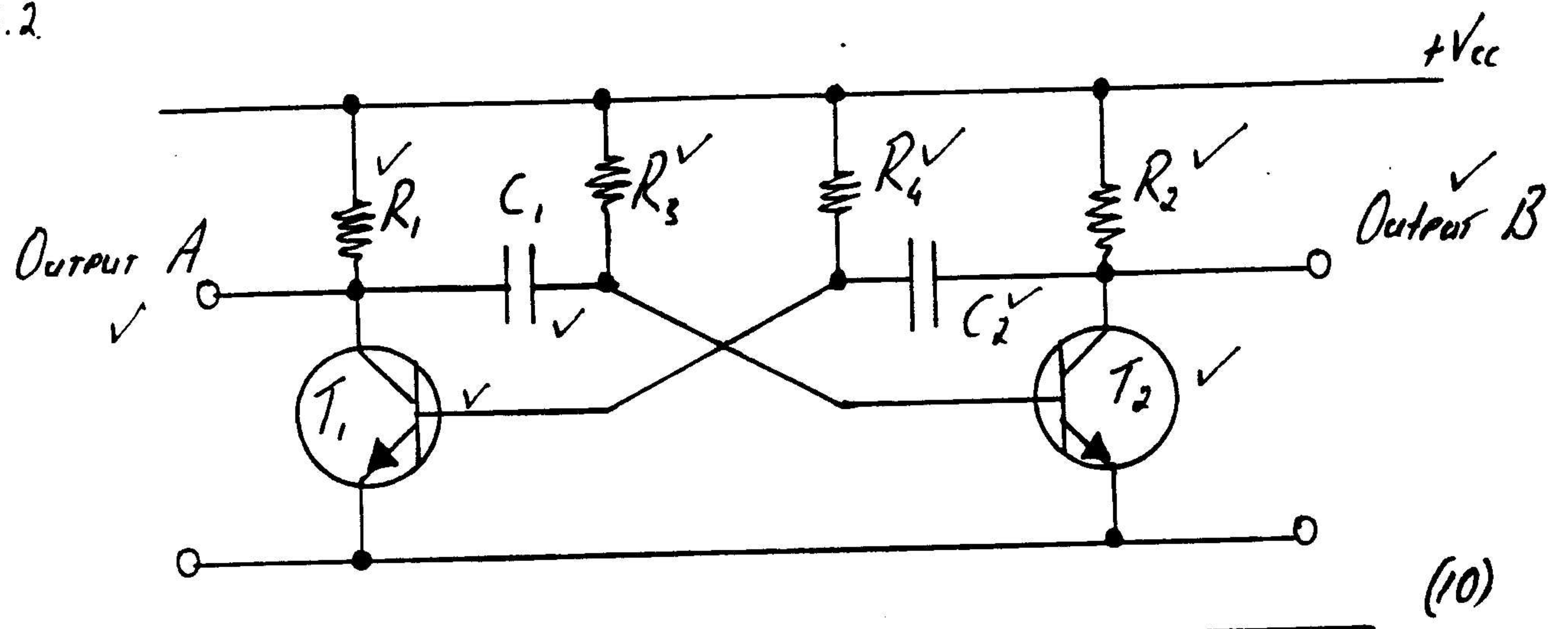
4.1.1.



4.1.2.



4.2

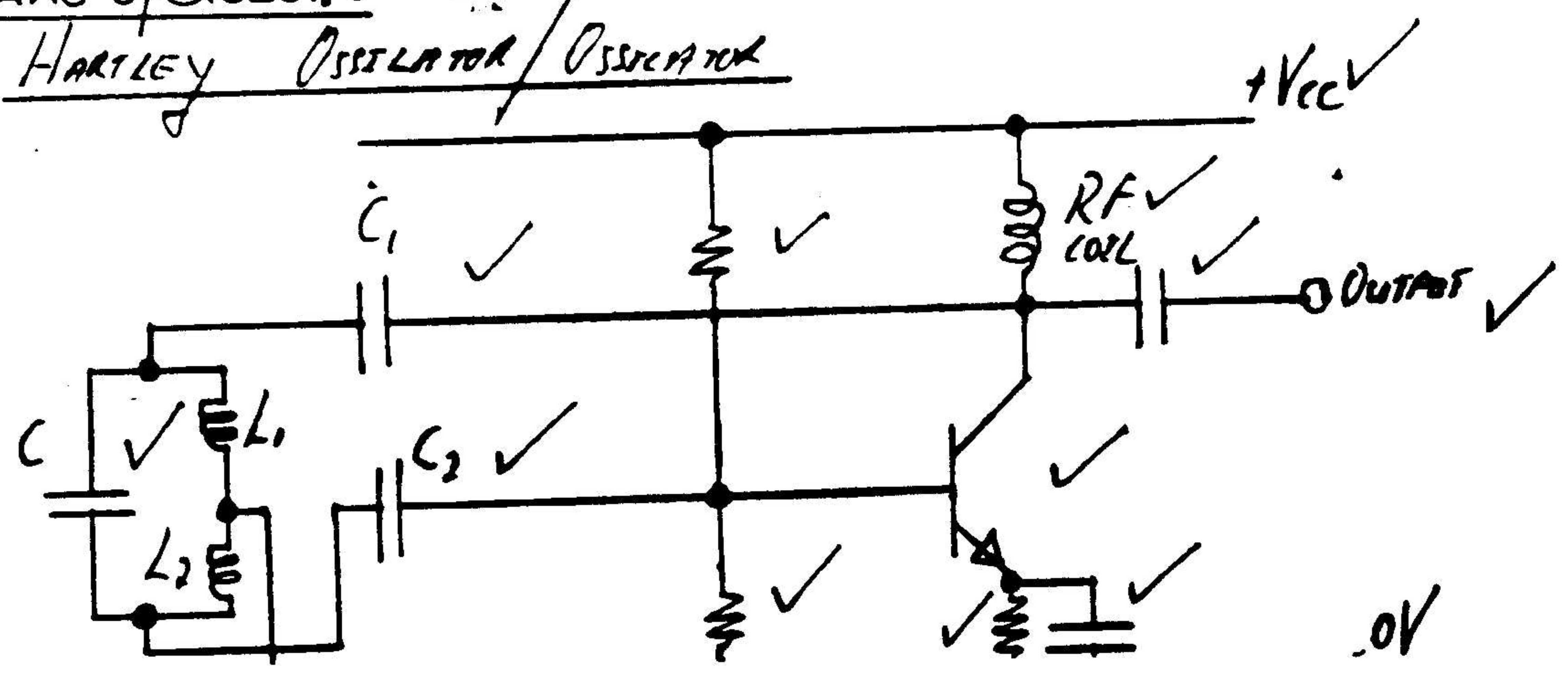


4.3. BESTABELE MULTIVIBRATOR / Bi-STABLE MULTIVIBRATOR. (1)

- 4.4. (a) Die stroom deur Basis/emitter van T_1 het T eerste hangeskakeel omdat die waardes van R_3 & R_4 kleiner is as die van R_1 & R_2 . (2)
- (b) Die kollektor van T_1 het die basis van T_2 op gro. en verseker dat T_2 af is. (2)

VRAAG 5 / QUEST. 5

5.1. HARTLEY OSSLATOR / OSSLATOR

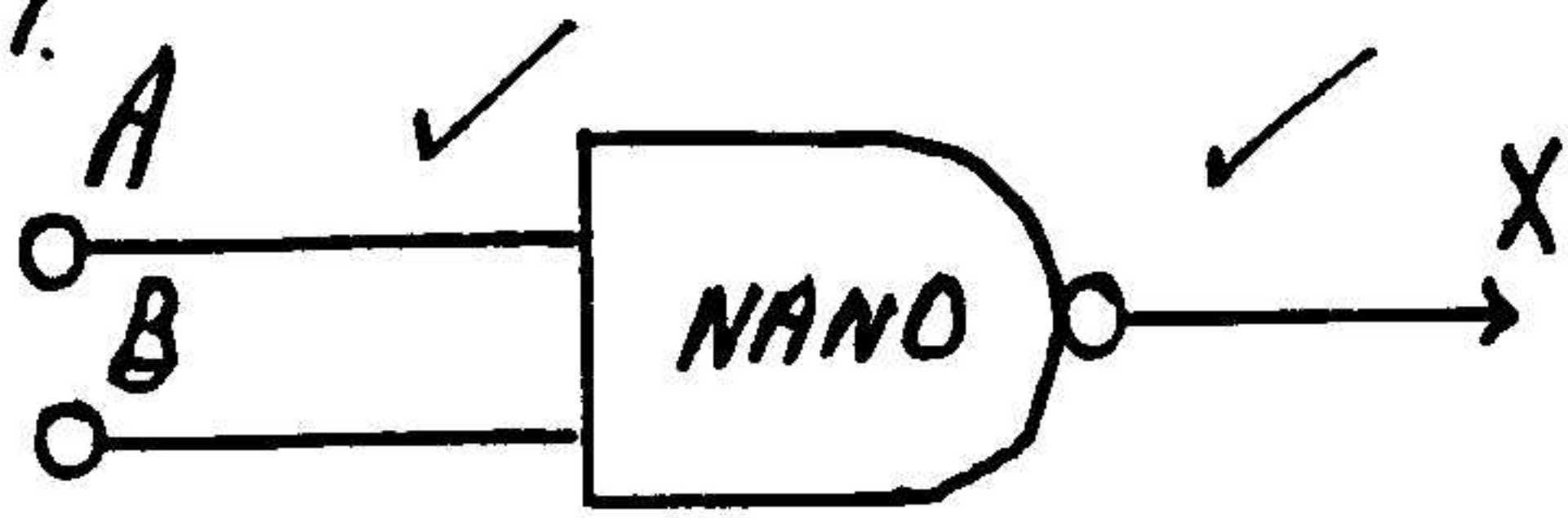


(12)

VRAAG 6 / QUEST. 6

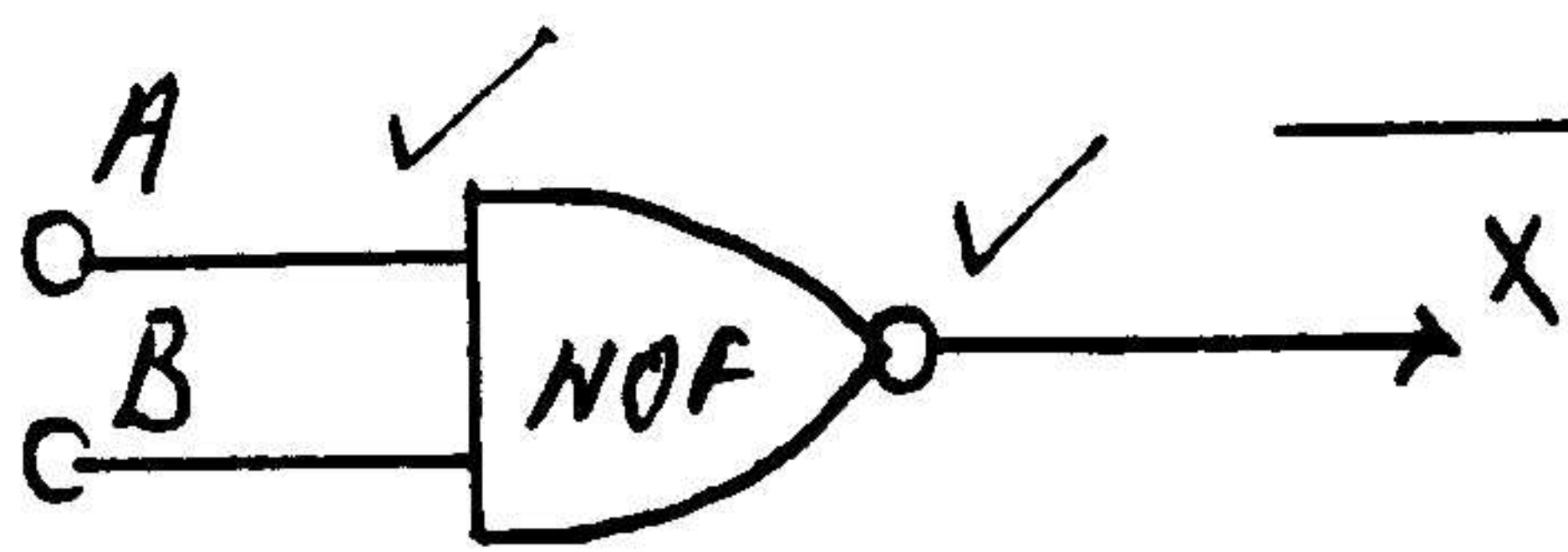
6.1.

6.1.1.



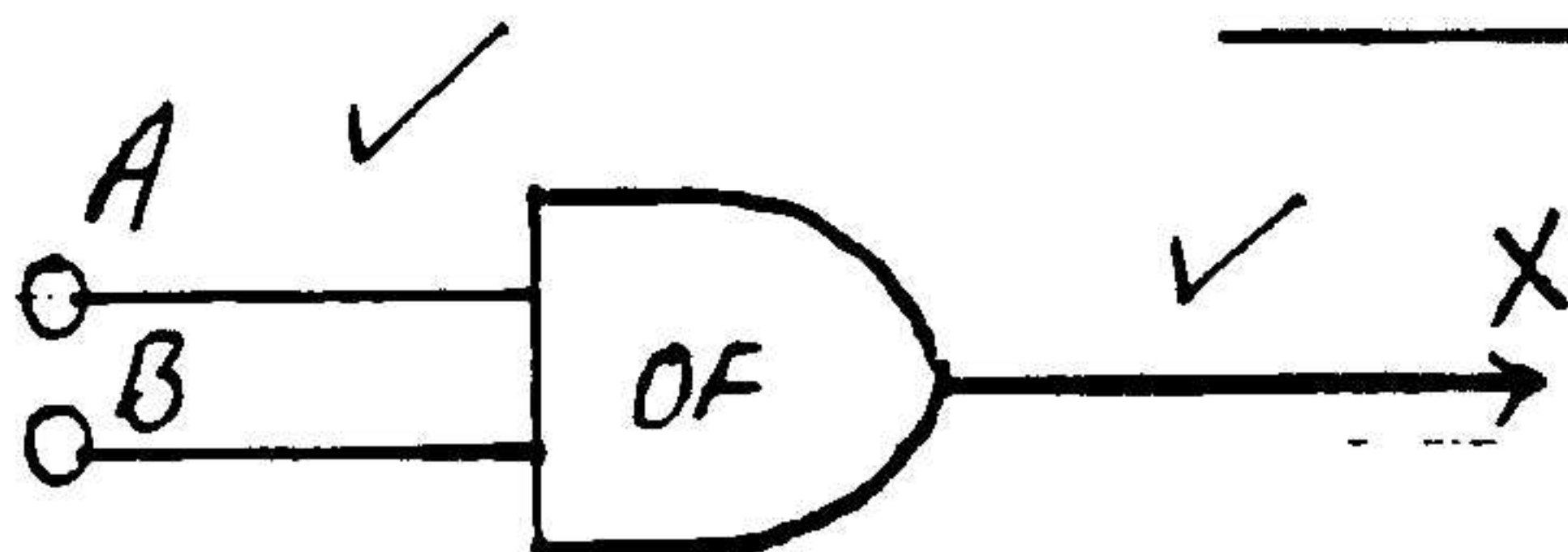
B	A	X
0	0	1
0	1	1
1	0	1
1	1	0

6.1.2



B	A	X
0	0	1
0	1	0
1	0	0
1	1	0

6.1.3.



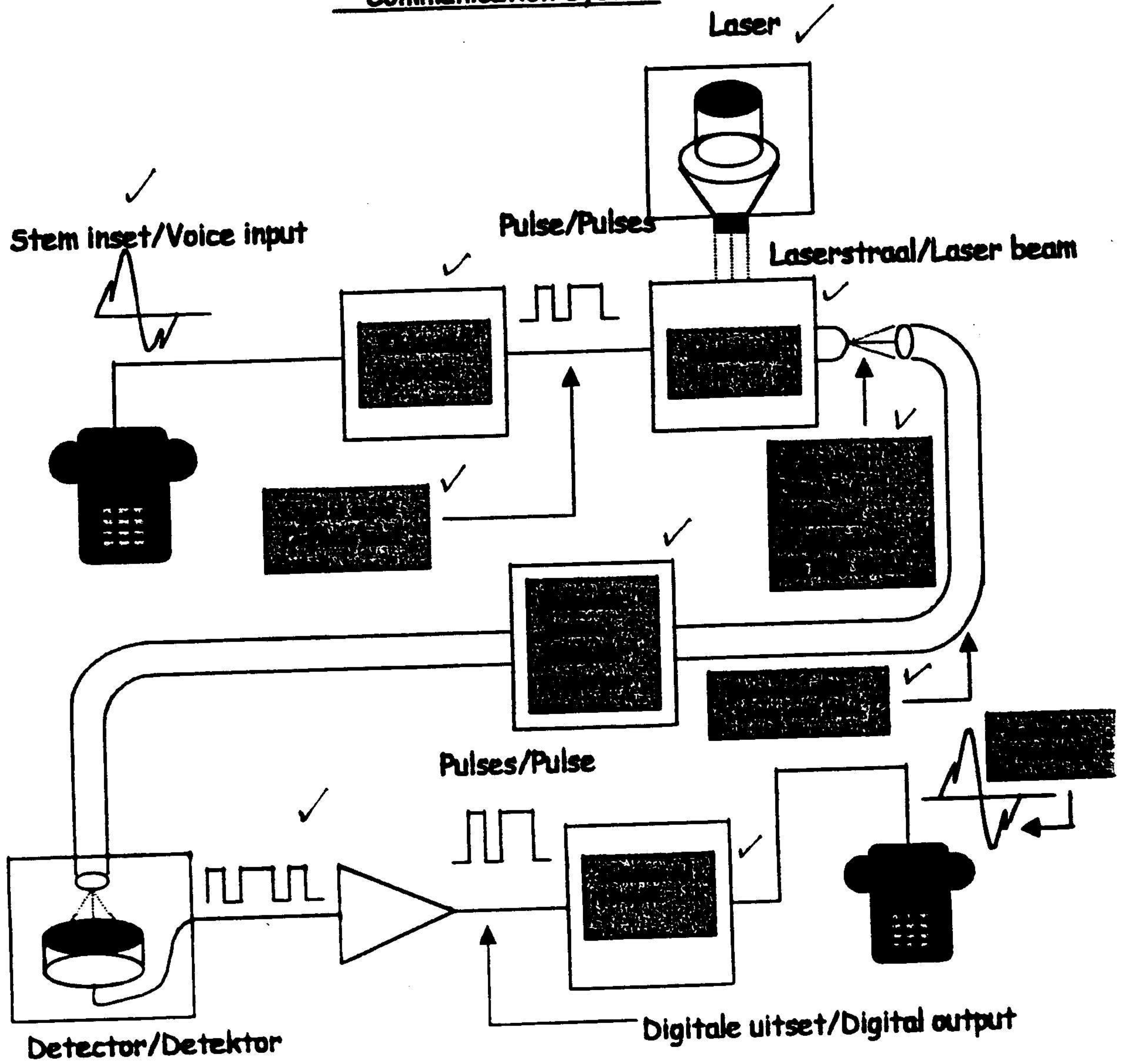
B	A	X
0	0	0
0	1	1
1	1	1
1	0	1

(12)

VRAAG 7 / QUEST. 7

7.1.

Optiese vesel Telefoon Stelsel / Fibre Optic Telephone
Communication System



8.1 (a) P-VOLTAGE = $4(0.1V) \times 1$ ✓ ✓
 = 4 VOLT → ✓ (2) /RAAG8/QUEST. 8

(b) P-VOLTAGE = 2V ✓
 ∴ R.M.S. (W.G.K.) = $2V \times 0,707$ ✓
 = 1,41 VOLT → ✓ (3)

(c) $f = \frac{1}{t}$
 $t = 3,4 \times (5 \times 10^{-3})$ ✓
 = 0,02 sek → ✓ (2)

$f = \frac{1}{t}$ ✓
 = $\frac{1}{0,02}$ ✓
 = 50 Hz → ✓ (3) (10)

VRAAG 9 / QUEST. 9

9.1

Veiligheidsmaatreëls / Safety Precautions.

- 9.1.1 Om te werk sonder toestemming. ✓
- 9.1.2 Om oorhaastig te werk. ✓
- 9.1.3 Om voorwerpe op gevaarlike plekke te laat rondlê. ✓
- 9.1.4 Om met die verkeerde gereedskap te werk. ✓
- 9.1.5 Om met loshangende klere te werk.
- 9.1.6 Om in die werkwinkel te speel.

English

- 9.1.1 Working without permission.
- 9.1.2 Working at unsafe speeds.
- 9.1.3 The placing of objects in dangerous places.
- 9.1.4 Working with the wrong tools.
- 9.1.5 Do not wear loose clothing.
- 9.1.6 Don't play in the workshop. (4)

9.2

- 9.2.1 Laat die persoon op sy rug lê.
- 9.2.2 Trek die persoon se kop agteroor sodat sy lugweg oop is.
- 9.2.3 Maak seker dat sy tong sy lugweg nie blokkeer nie.
- 9.2.4 Pas mond tot mond asemhaling toe.
- 9.2.5 Wissel af met hartmasering.

English

- 9.2.1 Let the person lie on his back.
- 9.2.2 Pull the person's head backward to ensure airway is open.
- 9.2.3 Make sure that the person's tongue does not block his airway.
- 9.2.4 Practice mouth to mouth respiration.
- 9.2.5 Apply heart massage in-between. (5)

9.3

- 9.3.1. Vals / FALSE ✓
- 9.3.2. Vals / FALSE ✓

(2)