Homework 2.1

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HW 2.1

10.0/10.0 points (graded)
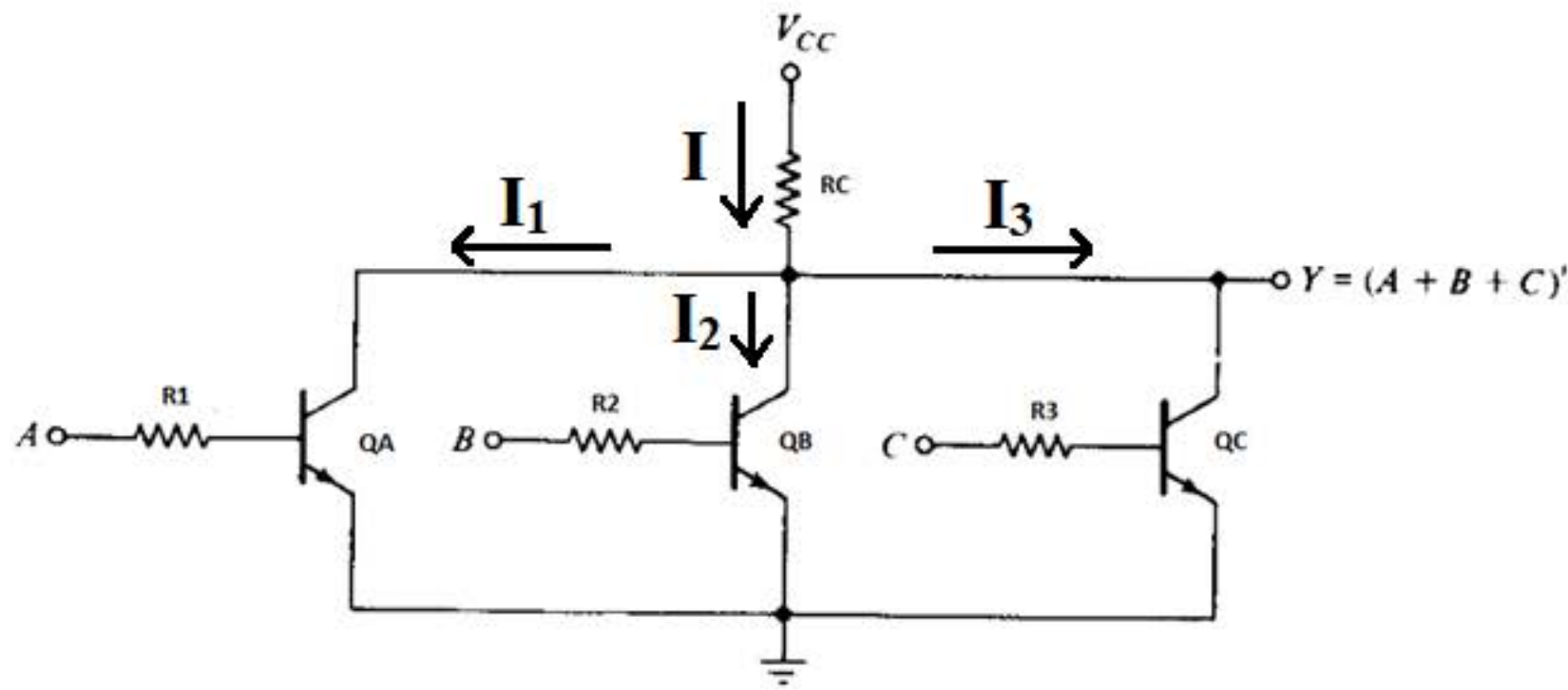
In this circuit $R_1 = R_2 = R_3 = 100k\Omega$, $R_C = 10k\Omega$, $V_{CC} = 20V$.

Now if the inputs voltages are $V_A = 0V$, $V_B = 10V$ and $V_C = 10V$.

Assume for saturation mode $V_{BE} = 0.8V$, $V_{CE} = 0.2V$.

Find out the output voltage in V.

| 0.2 | ✔ |

0.2

Find out the value of I in mA.

| 1.98 | ✔ |

1.98

Find out the value of I_2 in mA.

| 0.99 | ✔ |

0.99

Find out the value of I_3 in mA.

| 0.99 | ✔ |

0.99

Homework 2.2

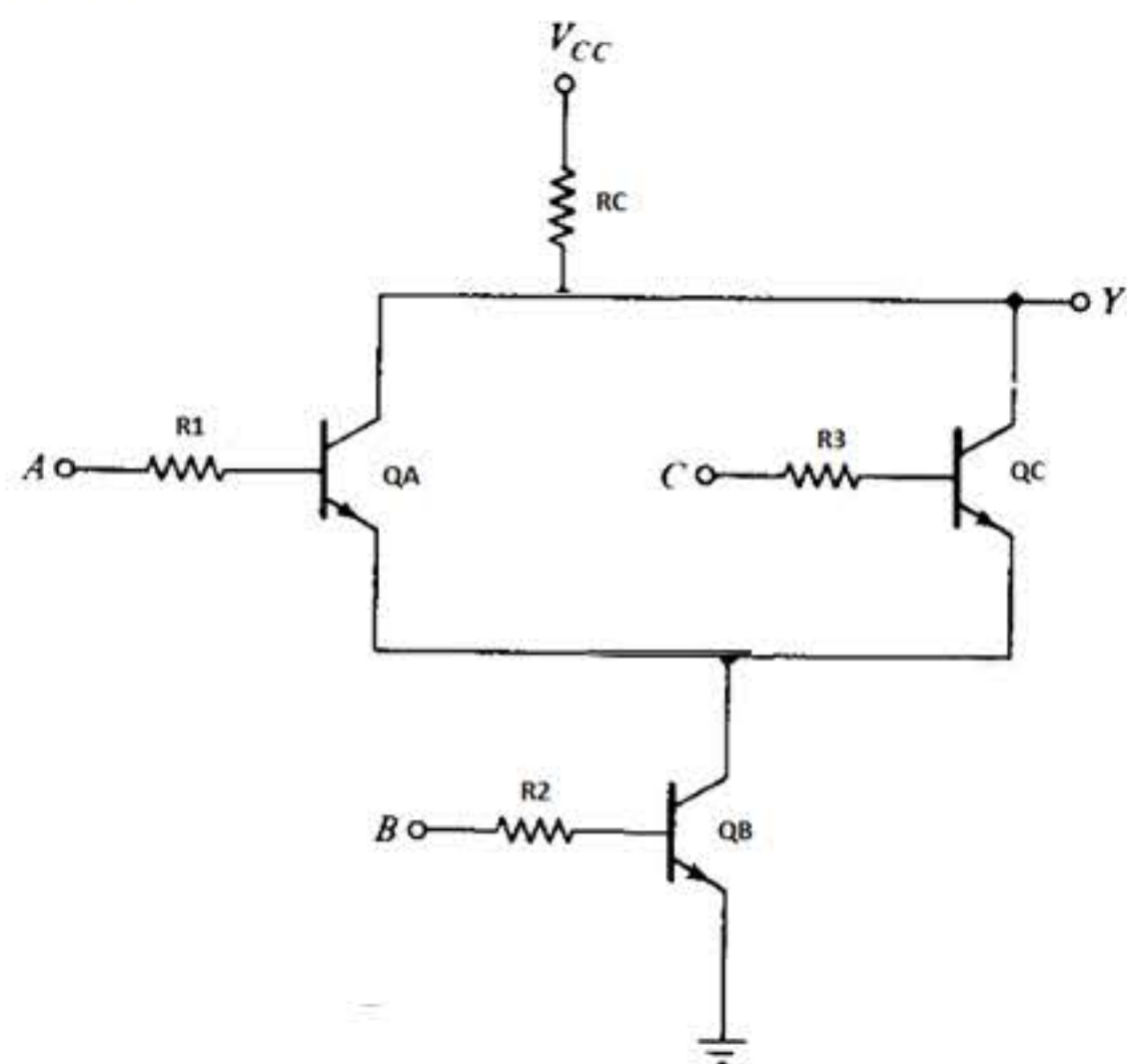🔖 Bookmark this page

HW 2.2.1

10/10 points (graded)

⌨ Keyboard Help

PROBLEM

In this circuit R1 = R2 = R3 = 100 k Ohm , RC = 10 k Ohm , VCC = 20 V.

Assume for saturation mode V_BE = 0.8 V, V_CE = 0.2 V.

Find out the output voltage in Volts.

0.2	0.2		

$V_A(V)$	$V_B(V)$	$V_C(V)$	$V_Y(V)$
0	0	0	20
0	0	10	
0	10	0	
0	10	10	0.4
10	0	0	
10	0	10	20
10	10	0	
10	10	10	

Submit   You have used 3 of 5 attempts.
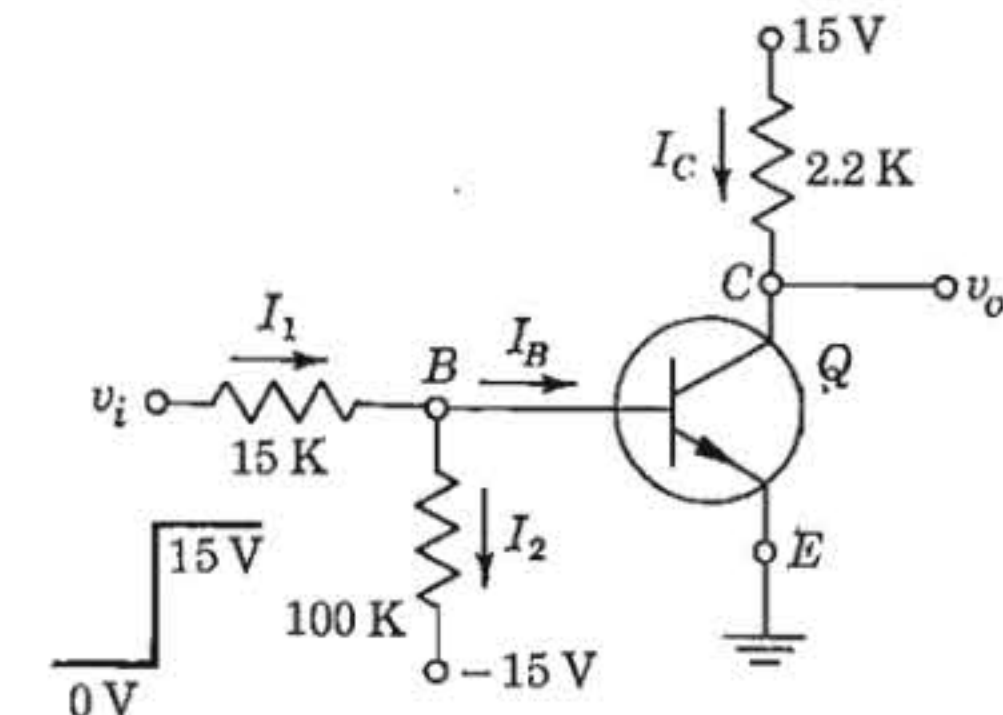
🔄 Reset   ⓘ Show Answer

FEEDBACK

✔ Correctly placed 3 items.

✔ Your highest score is 10.0

HW 2.2.2

10/10 points (graded)

Now if the inputs voltage is $V_i = 15V$.

Assume for saturation mode $V_{BE} = 0.8V, V_{CE} = 0.2V$.

Find out the output voltage in V.

0.2	✔

0.2

Find the value of I_C in mA.

6.7272	✔

6.7272

Find the value of I_1 in mA.

0.9467	✔

0.9467

Find the value of I_2 in mA.

0.158	✔

0.158

Find the value of I_B in mA.

0.7887	✔

0.7887

Homework 2.3

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HW 2.3

10/10 points (graded)
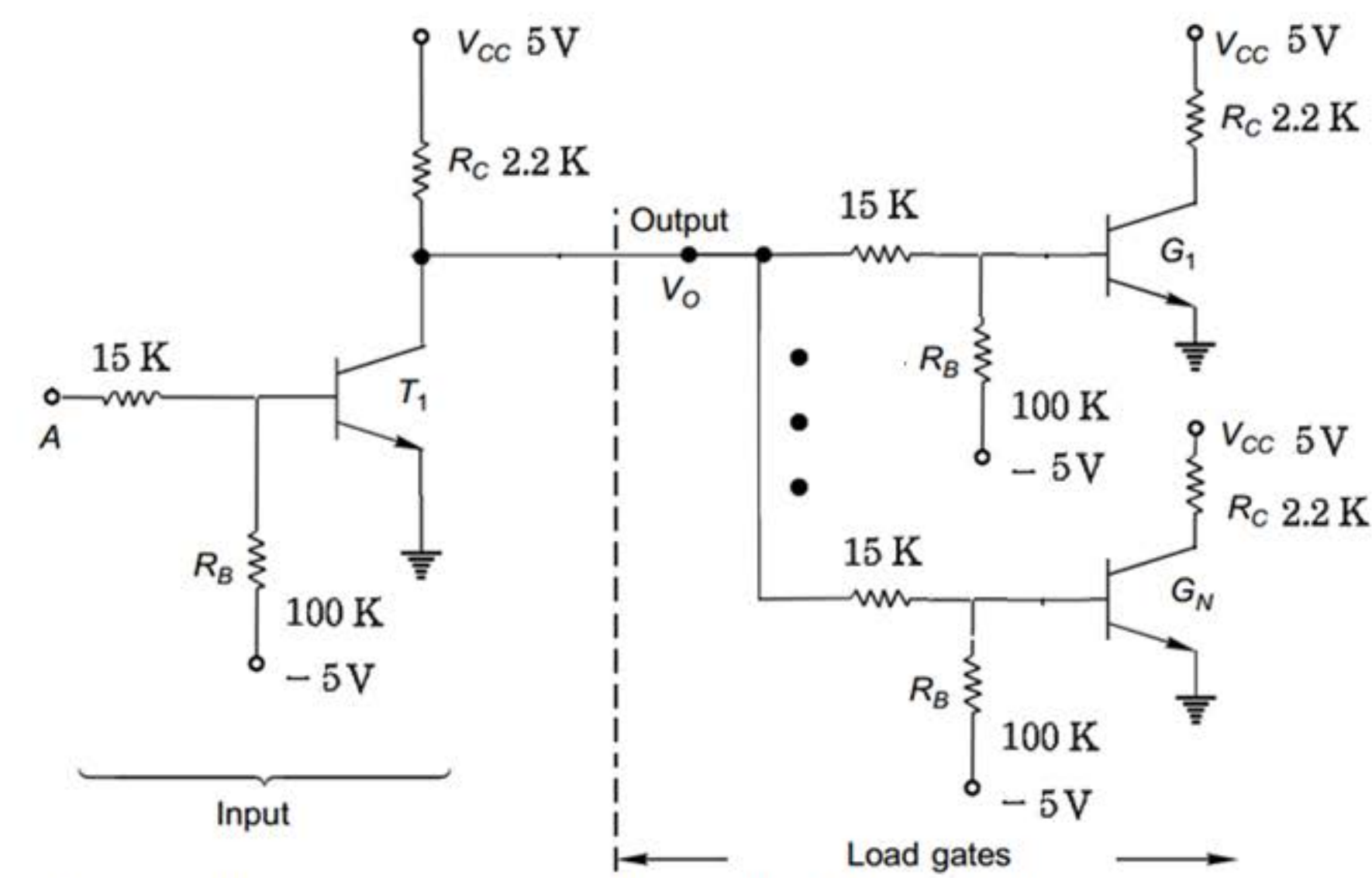
For the above RTL inverter circuit assume $V_{OH} = 4V$ and $V_{OL} = 0.2V$.

Also assume common emitter current gan $\beta_F = 30$.

Assume for saturation mode $V_{BE} = 0.8V$, $V_{CE} = 0.2V$ and cut in voltage for transistor $V_\gamma = 0.5V$.

Find the value of V_{IL} in V.

| 1.325 | ✔ |

1.325

Find the value of V_{IH} in V

| 2.7608 | ✔ |

2.7608

Calculate the noise margin in V.

| 1.125 | ✔ |

1.125

Find the maximum number of FANOUT for this cicuit.

| 2 | ✔ |

2

Homework 2.4

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HW 2.4

10/10 points (graded)
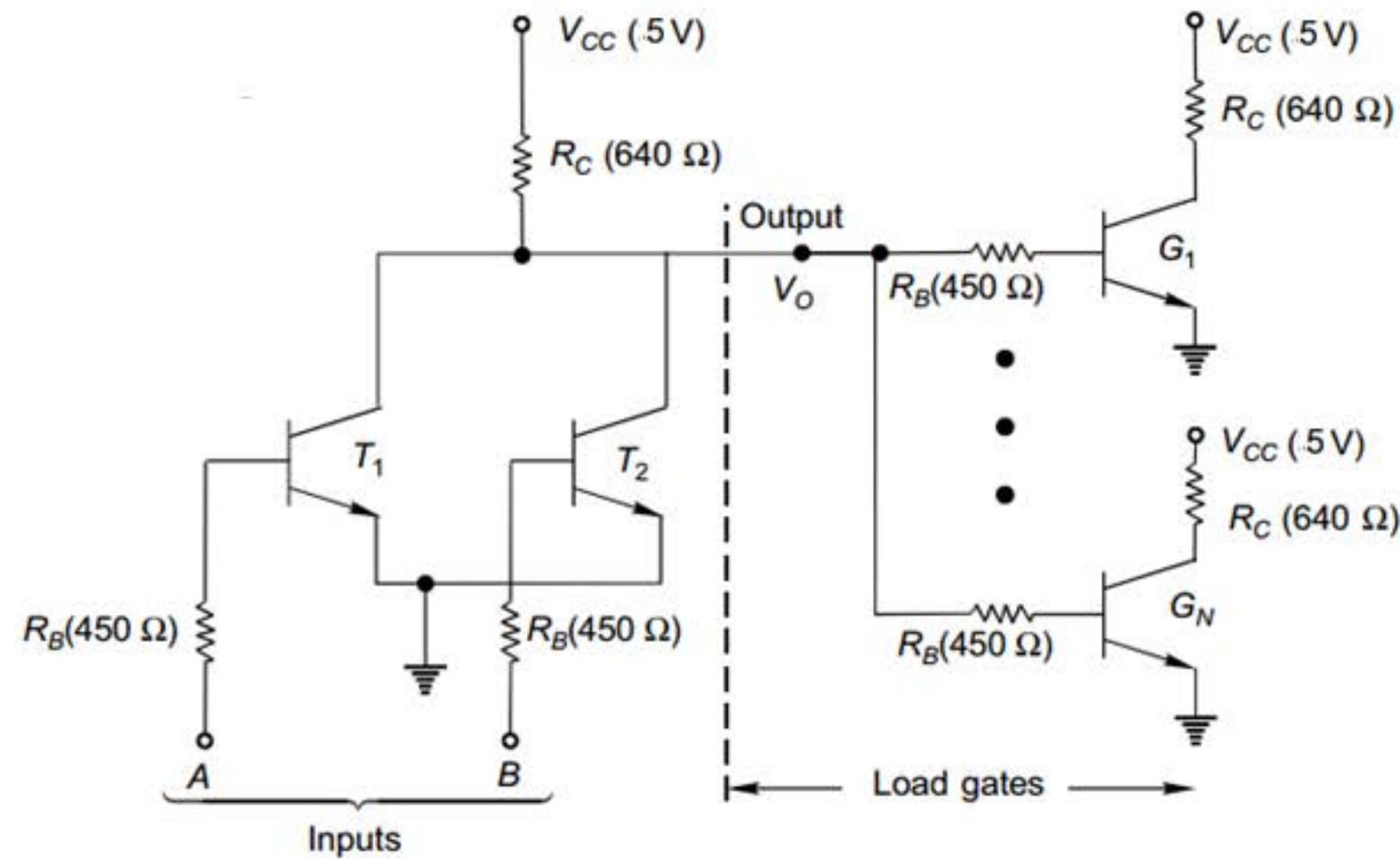
For the above RTL inverter circuit assume $V_{OH} = 2.5V$ and $V_{OL} = 0.2V$.

Also assume common emitter current gan $\beta_F = 30$.

Assume for saturation mode $V_{BE} = 0.8V$, $V_{CE} = 0.2V$ and cut in voltage for transistor $V_\gamma = 0.5V$.

Find the maximum number fo FANOUT for this circuit.

1	✔

1

Find the value of β_{min}.

1.946	✔

1.946

Homework 2.5

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HW 2.5

20/20 points (graded)
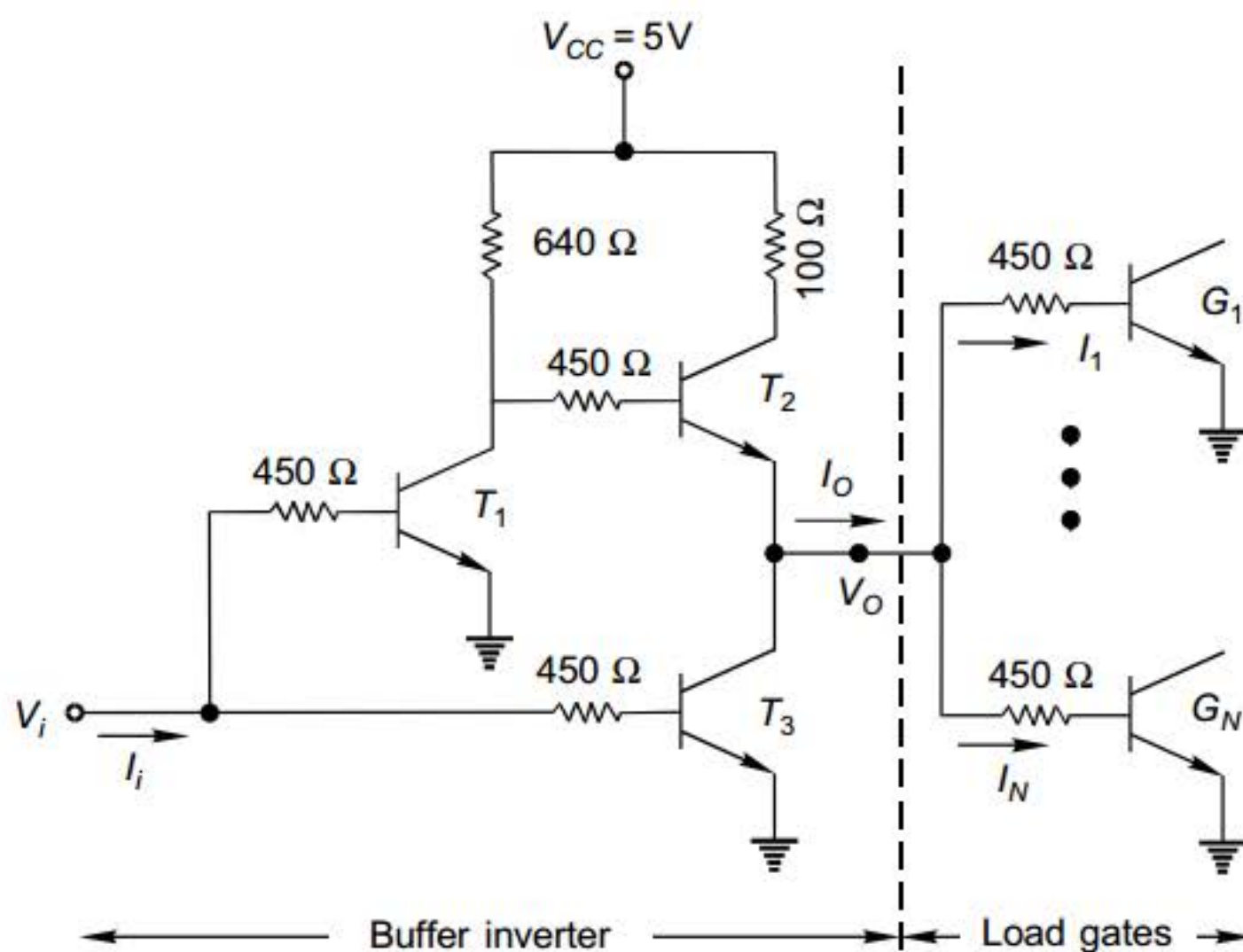
For the above RTL inverter circuit assume $V_{OH} = 2.5V$ and $V_{OL} = 0.2V$.

Also assume common emitter current gan $\beta_F = 30$.

Assume for saturation mode $V_{BE} = 0.8V$, $V_{CE} = 0.2V$ and cut in voltage for transistor $V_\gamma = 0.5V$.

Find the value of maximum FANOUT.

| 13 | ✔ |

13

If we connect 7 load circuits to the driver circuit what would be the output voltage in V.

| 3.06 | ✔ |

3.06

Calculate the total power dissipate inside the driver circuit in mW when FANOUT is 7 and input is $0.2V$.

| 68.19 | ✔ |

68.19