Kashmala Nadeem

Physics Assignment

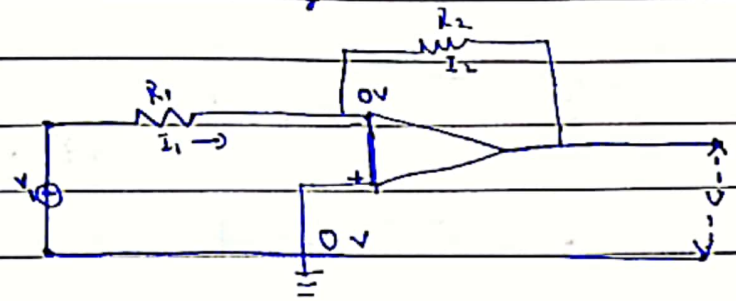
Week 8

# Short Questions

## Q1

Operating amplifier is used as an inverting configuration under virtual ground conditions. Under ideal conditions $V_+ \cong V_-$ if $V_+ = 0$, the virtual ground ensures $V_- = 0$.

$I_{in} = I_f$




## Q3

Connect both inputs of NAND gate together ($A = B$).

| A | Output $(Y) = \bar{A} \cdot \bar{A} = \bar{A}$ |
|---|---|
| 0 | 1 |
| 1 | 0 |

NAND gate behaves like a not gate.

## Q4

Given :-

$V_{cc} = 9V$, $I_c = 10mA$, $\beta = 100$, $V_{BE} = 0.6V$

Sol:-

$$I_B = \frac{I_C}{\beta} = \frac{10 \times 10^{-3}}{100} = 0.1\ mA$$

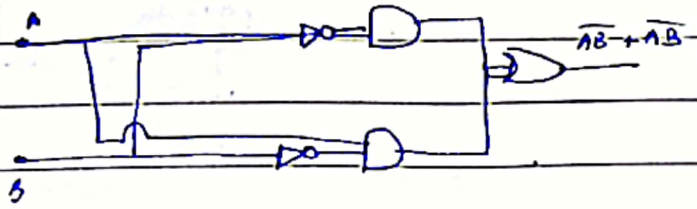
$$V_{RB} = V_{CC} - V_{BE} = 9 - 0.6 = 8.4\ V$$

$$R_B = \frac{V_{RB}}{I_B} = \frac{8.4}{0.1 \times 10^{-3}} = 84\ k\Omega$$

**Q5**

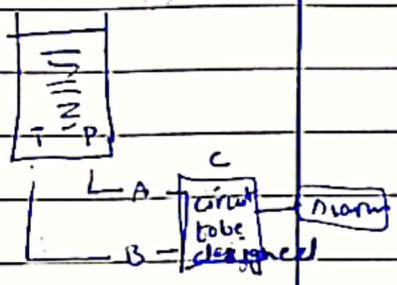
Truth table

| A | B | A+B | $\bar{A}+\bar{B}$ | $X=(A+B)(\bar{A}+\bar{B})$ |
|---|---|---|---|---|
| 0 | 0 | 0 | 1 | 0 |
| 0 | 1 | 1 | 1 | 1 |
| 1 | 0 | 1 | 0 | 0 |
| 1 | 1 | 1 | 1 | 1 |




**Q6**

| P | T | output |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 1 |




**Q2**