Q1a: A signal $V_i$ goes into the circuit shown below. Op amps are ideal.

1. (5 marks) Draw a table of possible values of $V_o$ and $V_A$. Indicate the values (of $V_-$, $V_+$) table entries correspond to.
2. (5 marks) Sketch the signals $V_A$ and $V_o$. At what time do any transitions occur?
Q2a: A 555 timer circuit is shown, with voltage supplies of $V_{CC} = 4.5\, \text{V}$ and ground. Are components are ideal.

1. (5 marks) Sketch graphs of $V_T$, $S$, $\bar{Q}$ on the axes indicated (at all times $t < 15\, \text{ms}$, $V_i$ was 5 V).

2. (5 marks) Sketch a graph of $V_o$ on the same axes as $V_i$. Indicate the times of any transitions.
Q1b: A signal $V_i$ goes into the circuit shown below. Op amps are ideal.

1. (5 marks) Draw a table of possible values of $V_o$ and $V_A$. Indicate the values (of $V_-$, $V_+$) table entries correspond to.
2. (5 marks) Sketch the signals $V_A$ and $V_o$. At what time do any transitions occur?
Q2b: A 555 timer circuit is shown, with voltage supplies of \( V_{CC} = 6 \text{ V} \) and ground. Are components are ideal.

1. (5 marks) Sketch graphs of \( V_T \), \( S \), \( \bar{Q} \) on the axes indicated (at all times \( t < 15 \text{ ms} \), \( V_i \) was 9 V).

2. (5 marks) Sketch a graph of \( V_o \) on the same axes as \( V_i \). Indicate the times of any transitions.