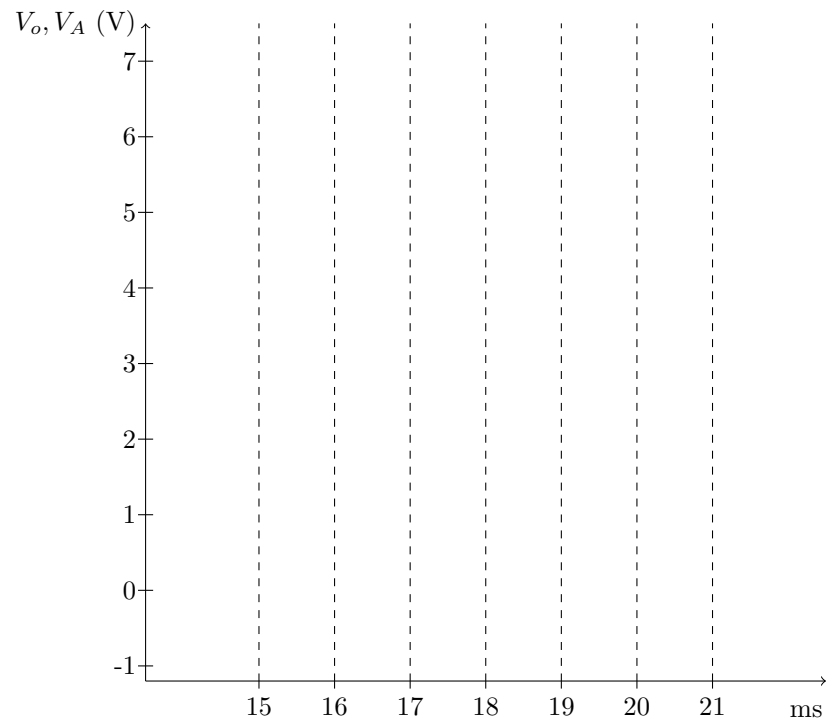
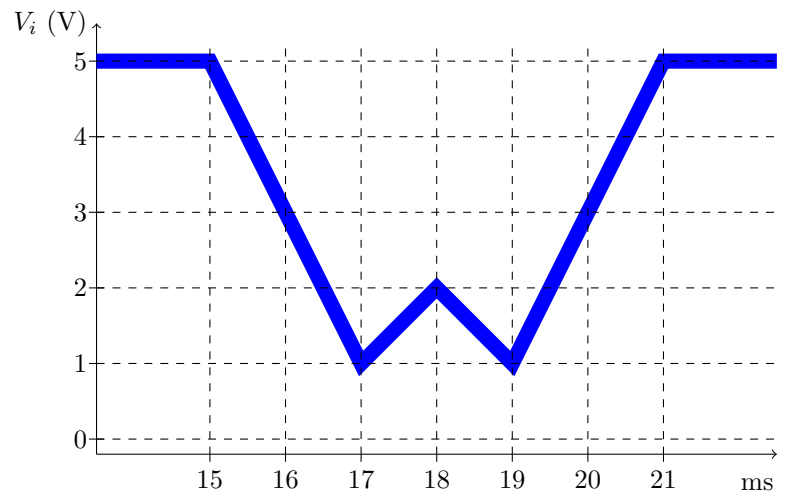
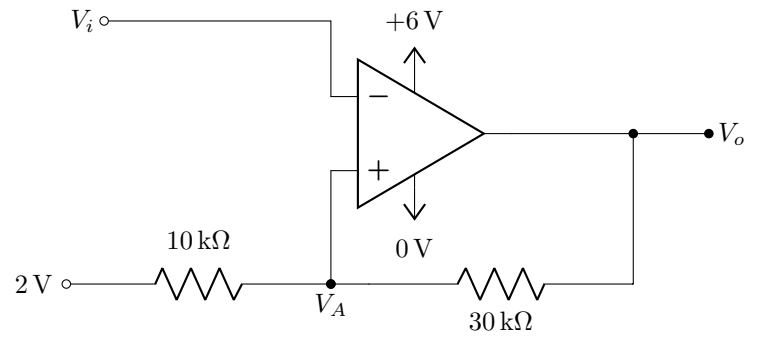


Instructions:

- This quiz lasts 30 minutes. Answer all questions (on both sides of the sheet)
- You may have a 8.5" × 11" sheet of notes and a non-network-connected calculator

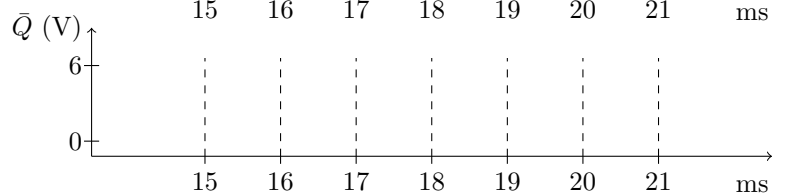
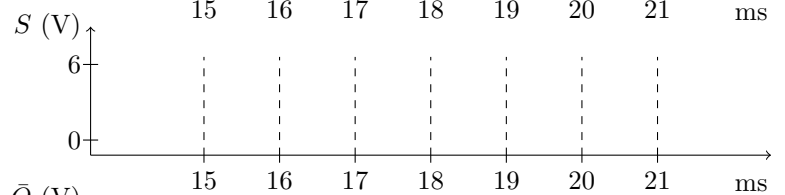
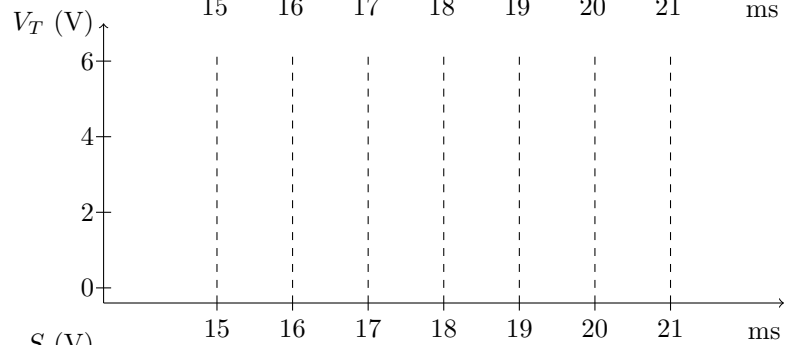
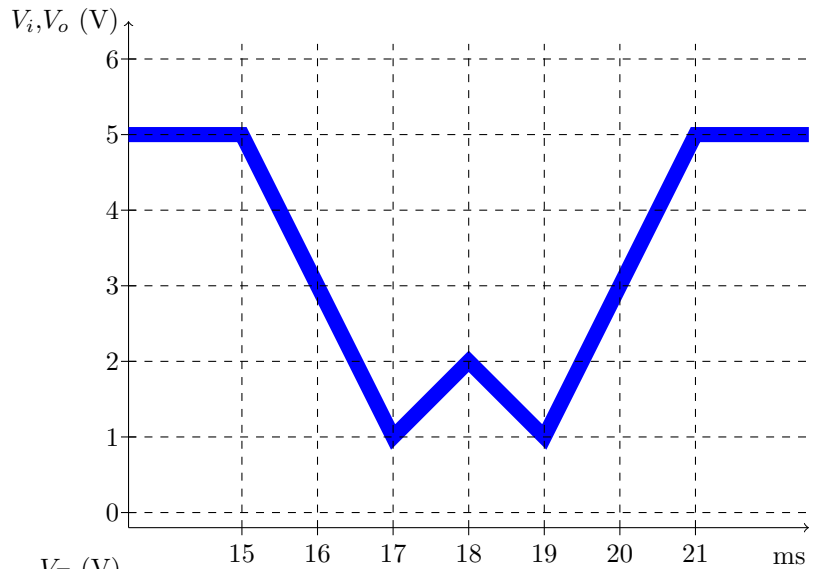
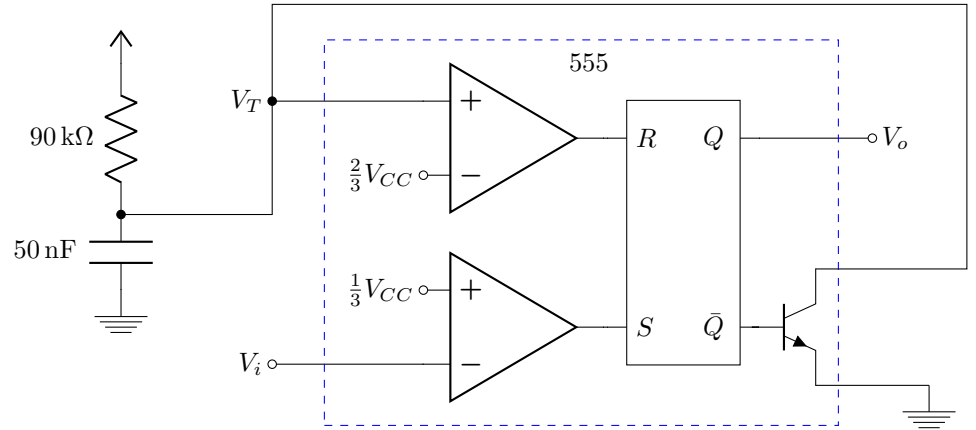
Q1a: A signal V_i goes into the circuit shown below. Op amps are ideal.

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.

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

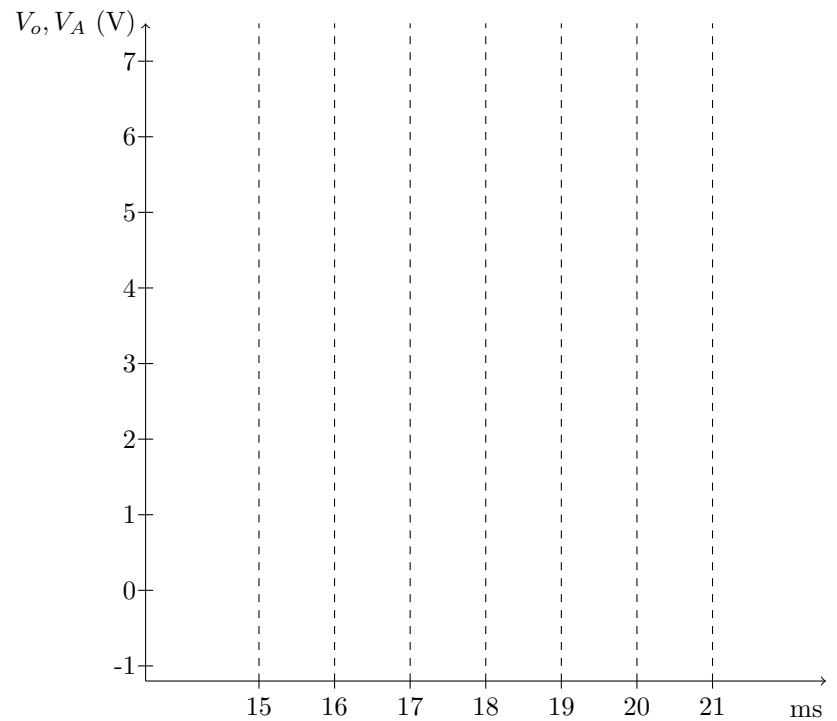
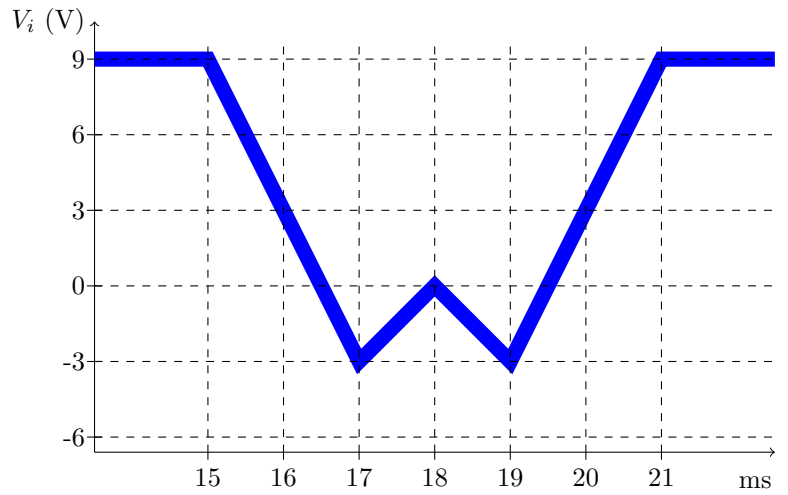
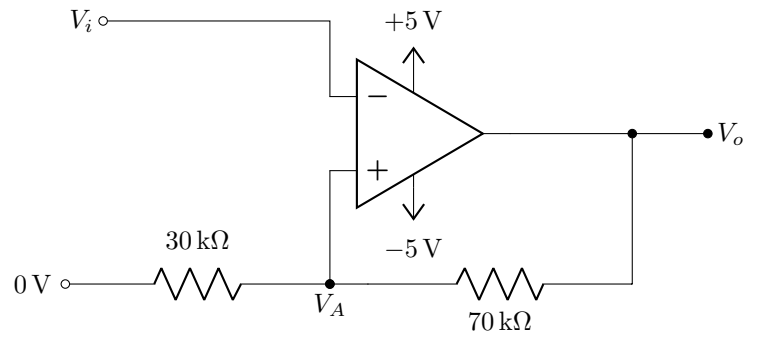


Instructions:

- This quiz lasts 30 minutes. Answer all questions (on both sides of the sheet)
- You may have a 8.5" × 11" sheet of notes and a non-network-connected calculator

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.

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

