

C - Test & Measurements
(Time 1.5 Hours - 30 Marks)

Competitor Instructions:

The **Test & Measurement** task is to construct a '**Night Rider**' unit onto a prototype board using the components supplied. Neatly layout the components and where possible form the wire and component leads such that they lie flat along to the surface of the prototype board :

- C1 - Connect the 'Night Rider' circuit components as shown in schematic sheets 1 to 3.
- C2 - With the aid of the 555 data sheets calculated values the value of resistors R1, R2 and capacitor C1. The output waveform of the 555 timer should be as shown in Figure 1.
- C3 - select a suitable supply voltage.
- C4 - Arrange the LEDs, in a single lines such that the LEDs come '**ON**' one after the other .
- C5 - With the aid of an oscilloscope measure the on and off time of LED 1, sketch the waveform and label the diagram showing voltage levels and time scales.
- C6 - demonstrate the 'Night Rider' working to a Judge.

Marking Criteria:

Task	Marks
C1	8
C2	3
C3	2
C4	6
C5	10
C6	1

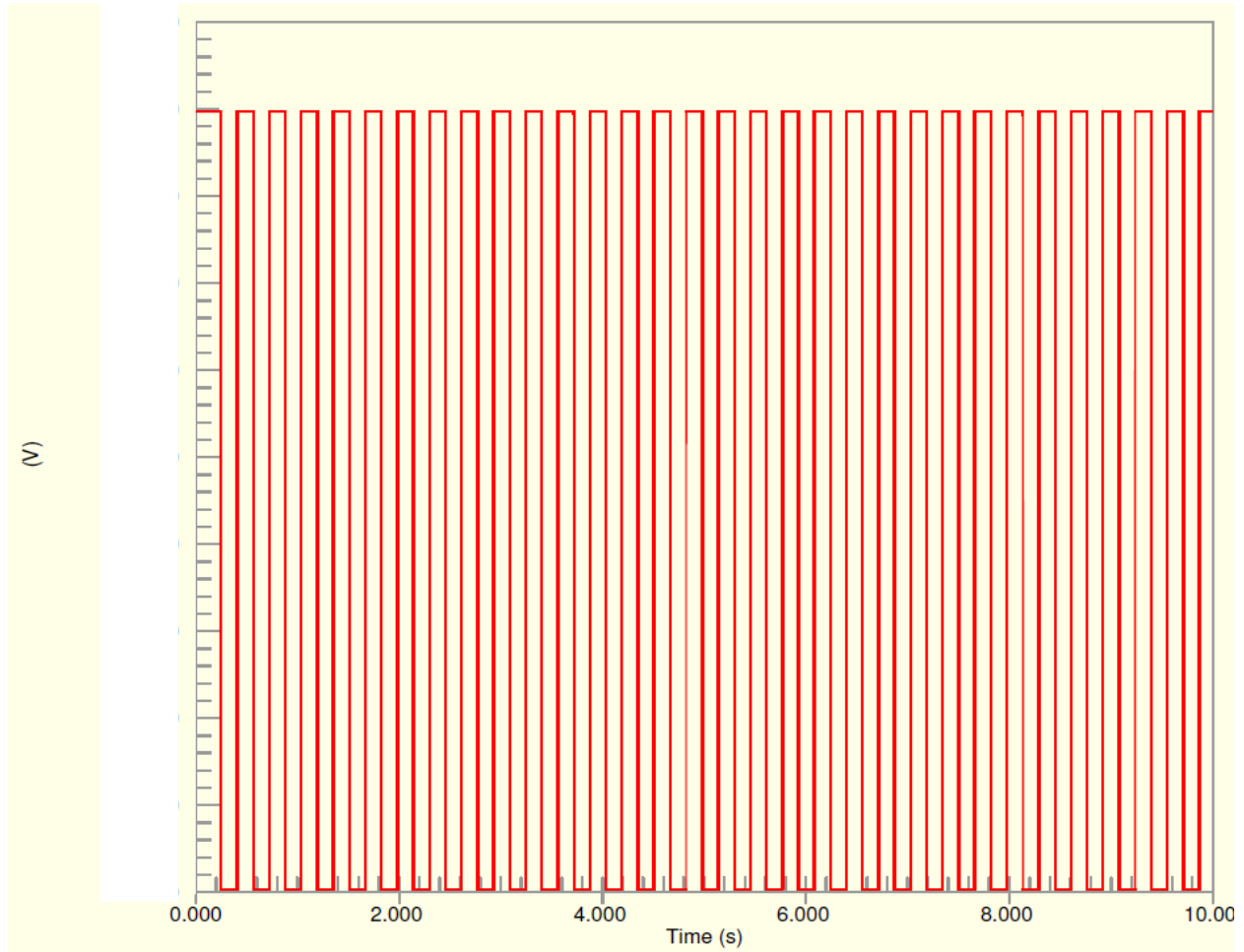
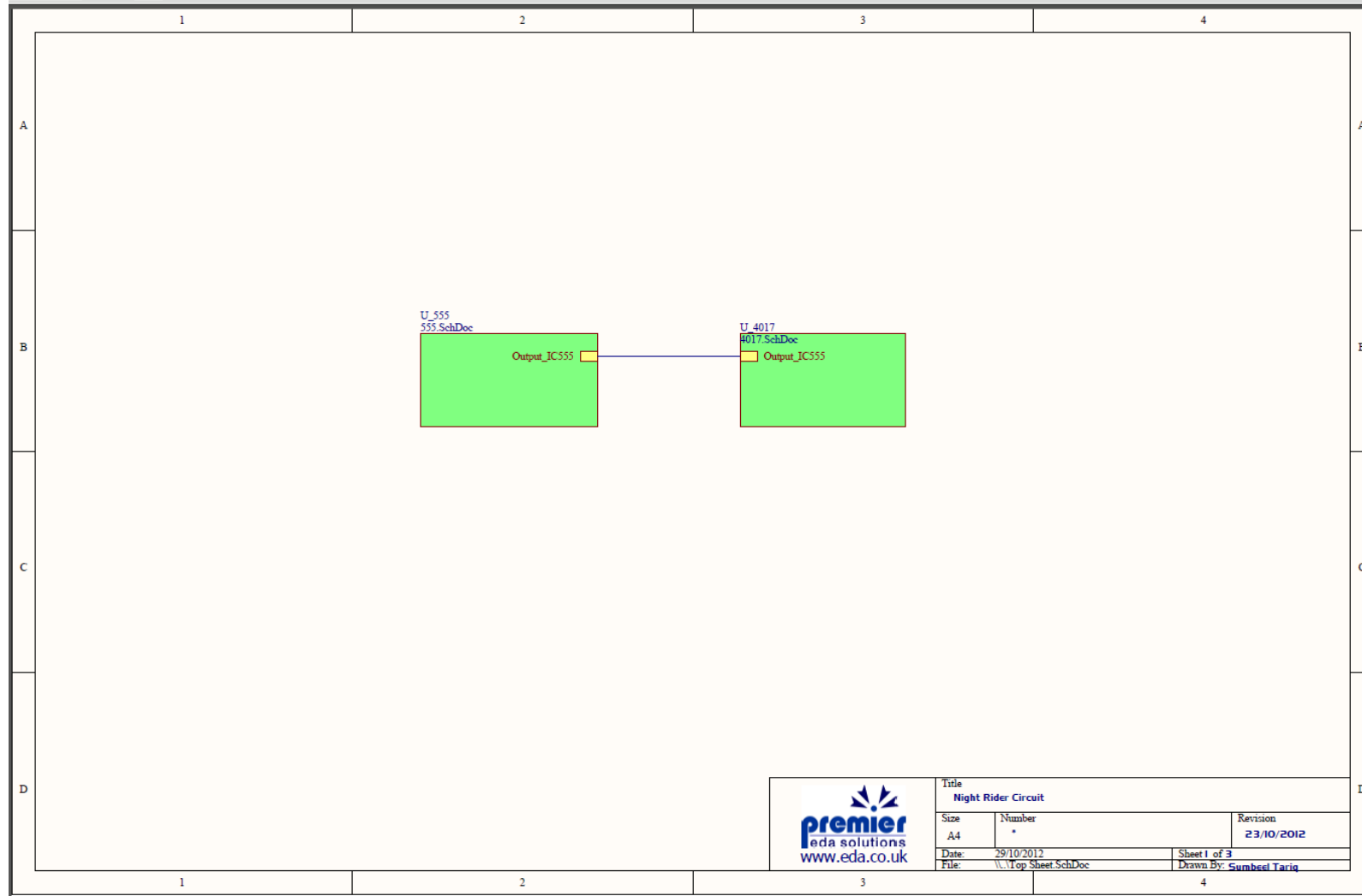
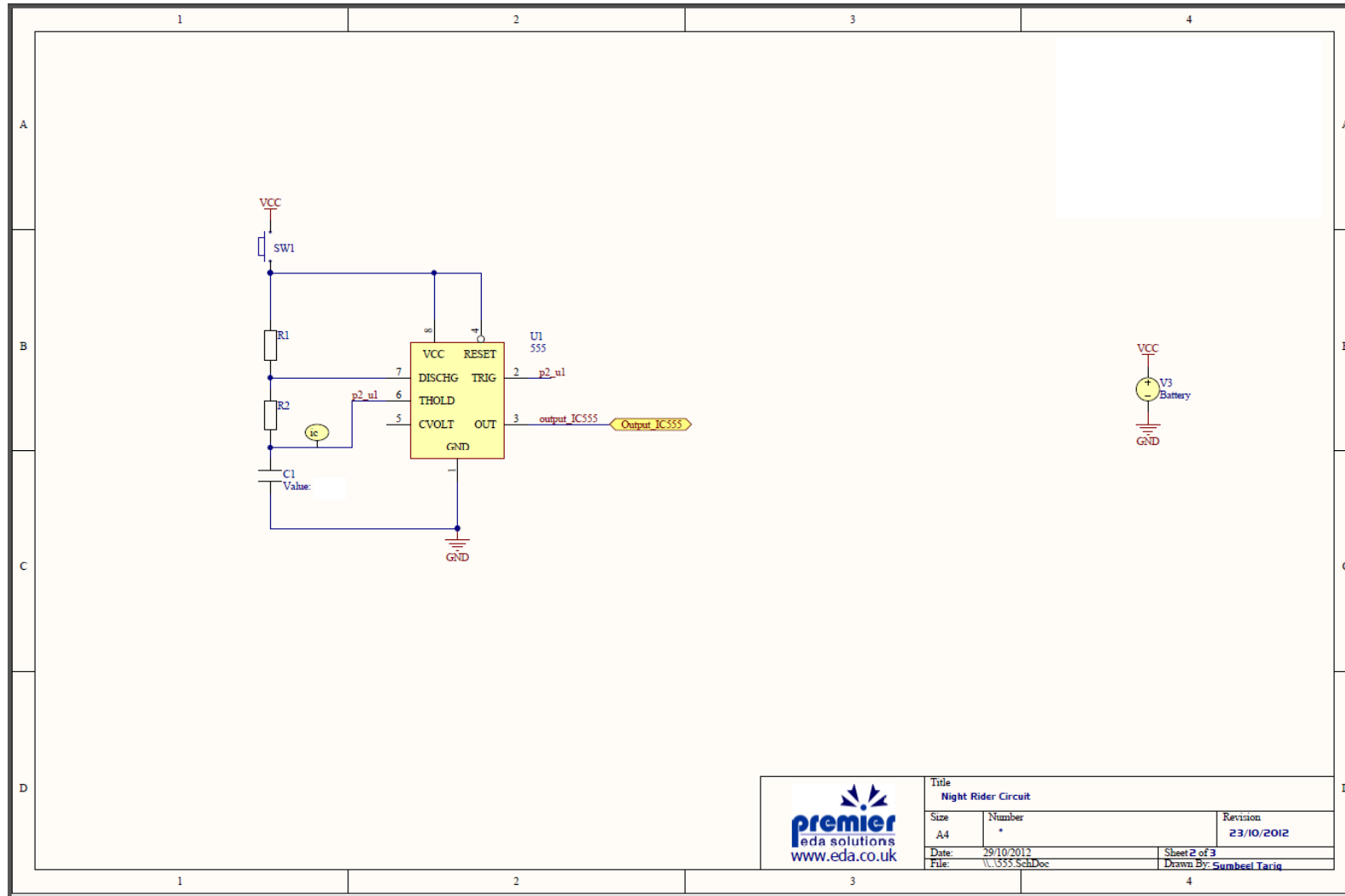


Figure1- Output waveform from the 555 timer

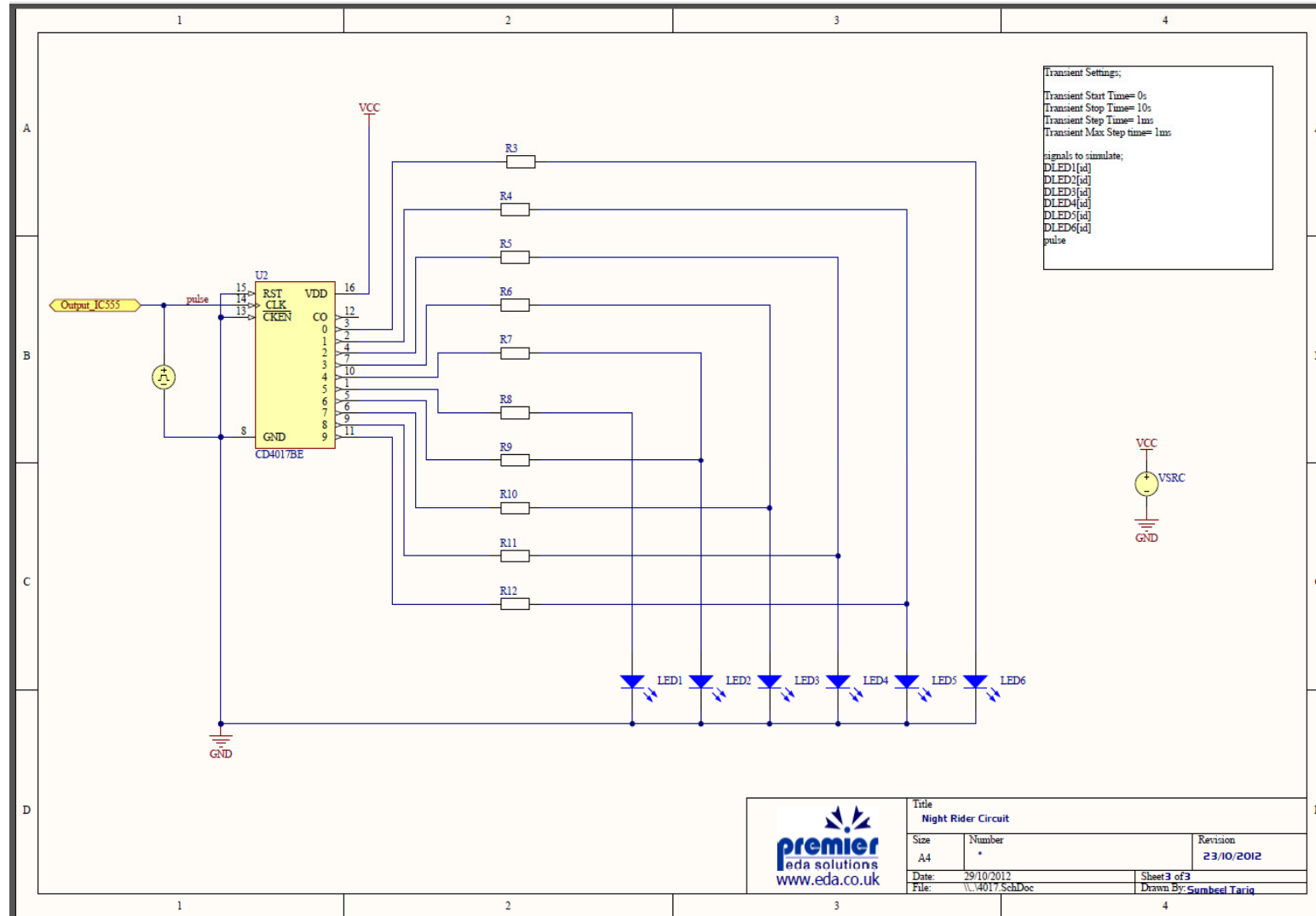
Circuit Diagrams: Sheet 1 of 3



Circuit Diagrams: Sheet 2 of 3



Circuit Diagrams: Sheet 1 of 3



ANSWER:

Component calculated values

Answer :

Waveform