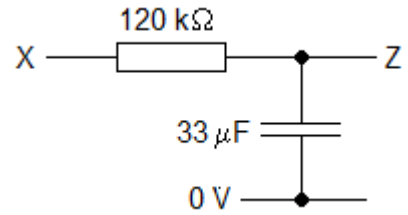


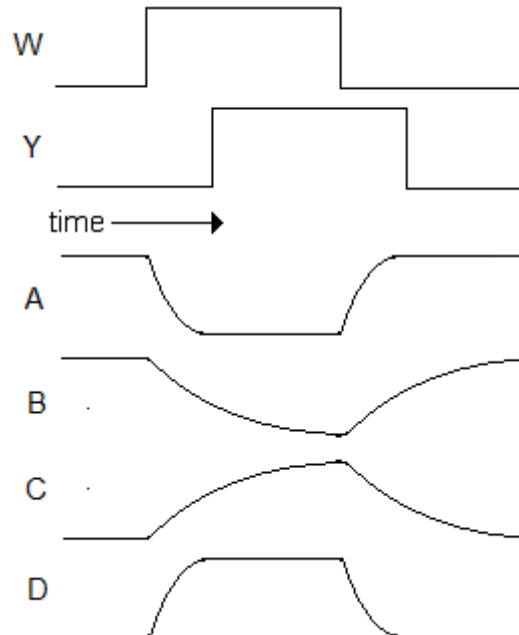
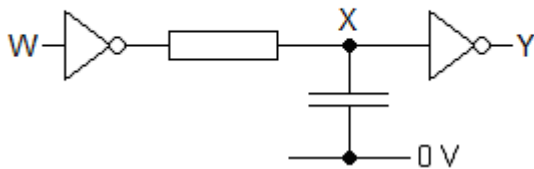
- 1 Here are some statements about the circuit opposite.
Which statements are correct?



- The time constant is 4 s.
- Charge cannot flow through the capacitor.
- There is no charge on the plate connected to 0 V.
- Z follows changes of voltage at X with a delay of 4 s.
- The voltage at Z is always less than the voltage at X.
- There is always the same current in both plates of the capacitor.

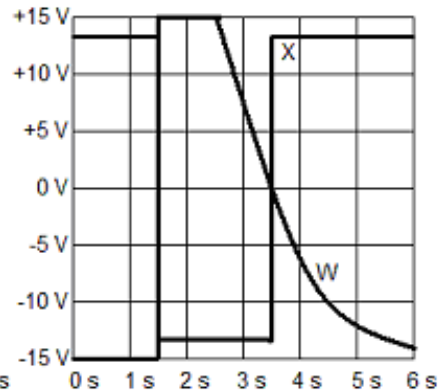
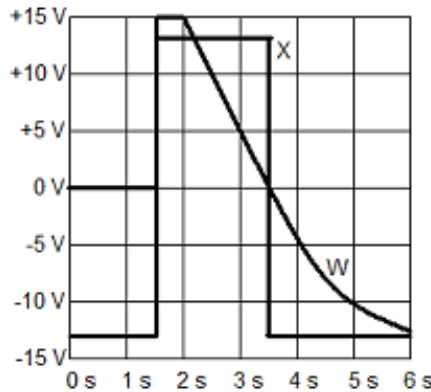
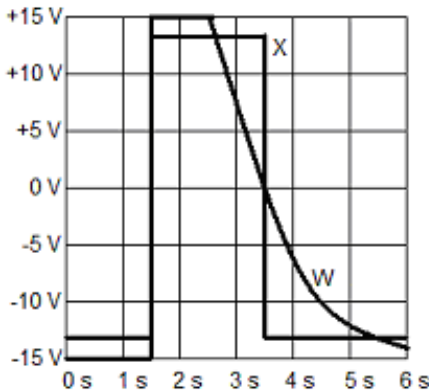
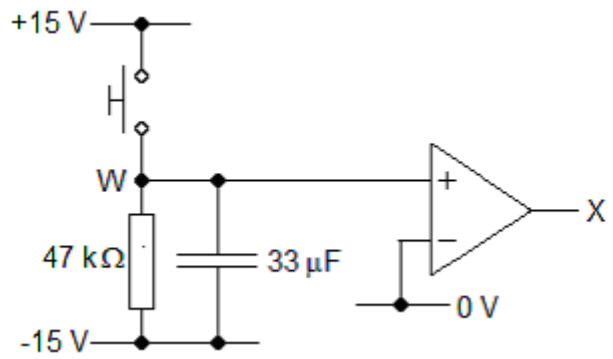
- 2 Do calculations to complete the table.

<i>R</i>	<i>C</i>	τ
2.7 MΩ	120 pF	
33 kΩ	220 nF	
	10 μF	5.6 s
	470 nF	130 ms
4.7 kΩ		100 ns
100 Ω		33 μs

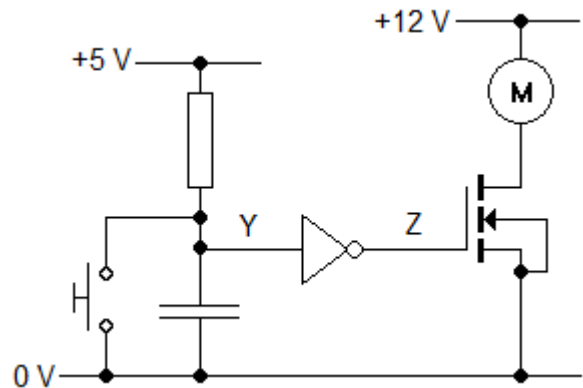


- 3 The timing diagram shows how signals at the output Y of the circuit above are related to signals at the input W.
Which of the signals A, B, C or D could be the signal at X?

4 Which of these voltage-time graphs correctly shows the signals at W and X when the switch is pressed and released?



5 The sentences below describe a sequence of events in this circuit. The motor turns on for a short while when the switch is briefly pressed and released. What is the correct order of the sentences?



- Y is low so Z is high.
- Y is high so Z is low.
- The switch is pressed.
- The switch is released.
- The MOSFET switches on.
- The MOSFET is switched off.
- There is a current in the motor.
- There is no current in the motor.
- The capacitor charges up slowly.
- The capacitor is instantly discharged.
- The capacitor is initially fully charged.
- Z changes state when Y reaches 2.5 V.
- The MOSFET changes state and the motor stops.