

Question B 1.0

The circuit shown in Figure 1 is under investigation

- Under normal operation of the circuit, what voltage would you **expect** to measure between TP1 and 0V? (1)
- Justify** for the value of 0V measured at TP2 (1)
- Show by means of a sketch, two multimeters connected (Figure 1) to take measurements at 'TP1' and 'TP2'. Indicate polarity and unit of measure. (1)

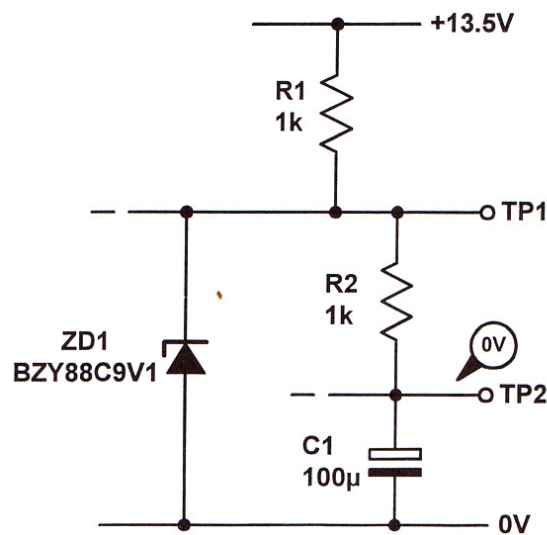


Figure 1

Answer:

a)

b)

Question B1.1

The following diagram in Figure 2 shows an oscilloscope being used to take measurements across a bridge network.

This method of taking measurements when the oscilloscope is powered from a normal UK mains supply will give an error. (13A outlet socket)

- a) What is the source of the error? (1)
- b) What action would you take to illuminate the error? (1)

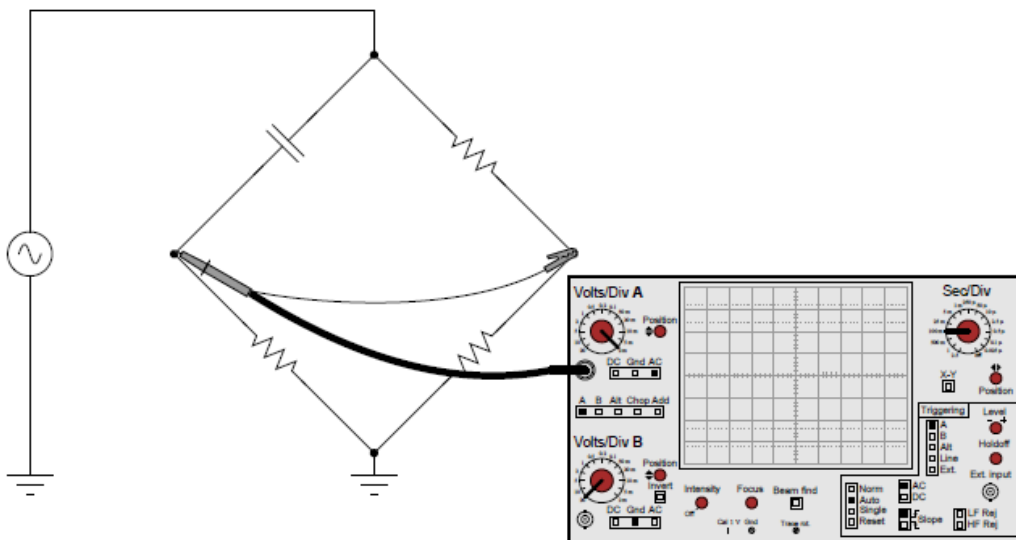


Figure 2.

Comment:

Question B1.2

This task is to measure the gain and frequency response of the circuit shown in Figure 3

- a) Neatly connect the Figure 3 circuit components onto a 'breadboard'. (0.5)
- b) Connect wires to the signal generator and power supply. (0.5)
- c) Connect the oscilloscope as shown with probe earths attached to 'Ground'. (0.5)
- d) Set the signal generator to sine wave, a frequency of 1Khz and an amplitude of 1 volt peak – to – peak (0.5)
- e) Set the power supply to the correct voltage and switch 'ON'. Sketch the correct input and output waveforms. (2)

Ans: Sketch Waveforms

- f) Compare the measured gain with the calculated value. (2)

Ans: Calculated Gain:

Ans :Measured gain

Equipment:

1 ---- dual regulated DC power supply with connecting leads, 1---- 2 input channel oscilloscope with probes, 1 ---Breadboard, 1----Adjustable Lab type Signal generator 100Hz to 1 MHz, 1 ----- Multimeter, 1----10k resistor, 1----20K resistor, 1-----6k8 Resistor, 1----- 741 amplifier, Selection of link up wire.

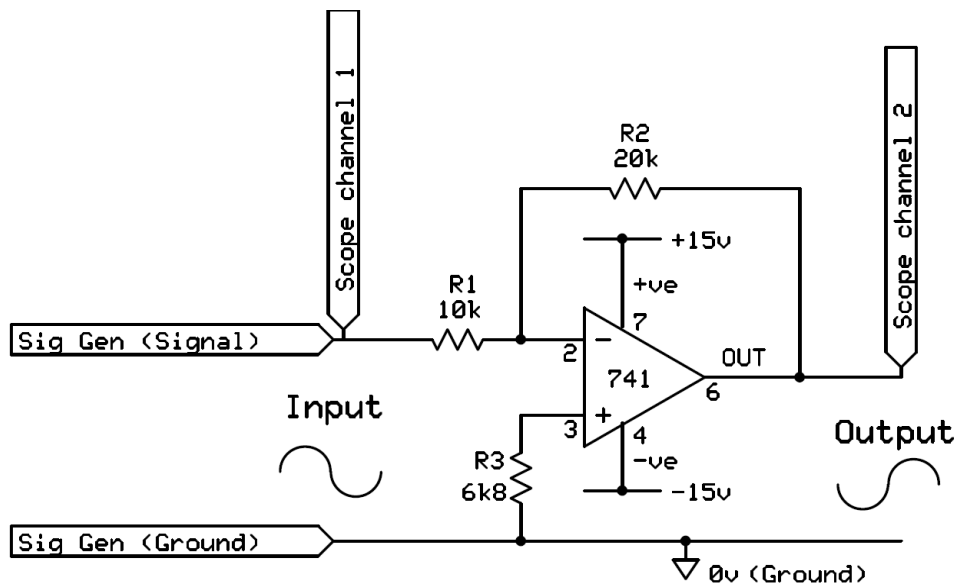
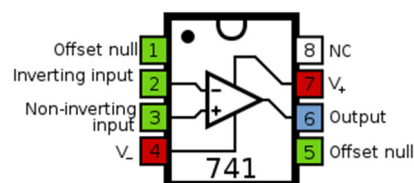


Figure 3



741 Pin Layout

Question B1.3

- a) Design a table, populate it with the waveform values as observed on the oscilloscope as the frequency is increased from 100Hz to 1 MHz. Choose the number of measurement that best gives a practical accurate indication of the frequency response of the circuit. (4)
- b) Plot the results on the graph paper provided and modifying the axis to display the frequency response measurements. (4)
- c) Comment on any observations. (1)

Ans c): Comment

Ans a): Table

Ans: b)

Frequency response

