

# PHYSICS 1003/1902

## Circuits Test SAMPLE

<b>Surname</b>	<b>First Name</b>
<b>SID</b>	<b>Team No. (e.g. 6TEC12)</b>
<b>The solutions to this Test can be found on the unit WebCT site under the  <i>Experimental Physics Lab and Past Examination Papers</i> links</b>	

Duration **30** minutes / Open book test / No need to show working, only the final answer is checked / All numerical answers must have appropriate units and appropriate significant figures.

### Question 1

Suppose you have a 9.0 V DC voltage source and two 22 k $\Omega$  resistors.

(a) Draw a circuit where the two resistors are connected in series and the combination connected to the voltage source.

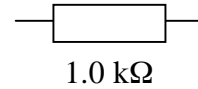
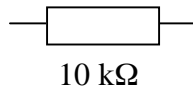
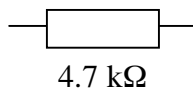
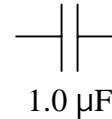
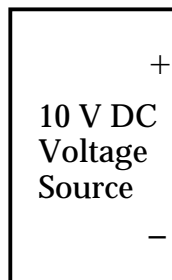
**(1 mark)**

(c) What is the current flowing out of the voltage source?

**(1 mark)**

### Question 2

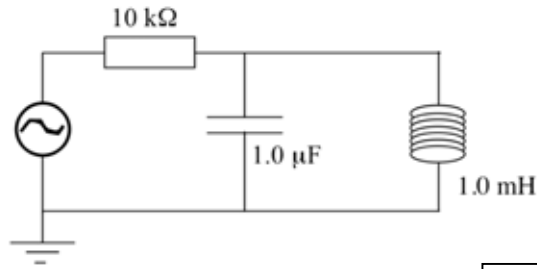
You are given the following circuit elements:



Draw a circuit diagram, using some or all of these elements, in which the voltmeter measures a voltage of 3.0 V.

**(2 marks)**

**Question 3**

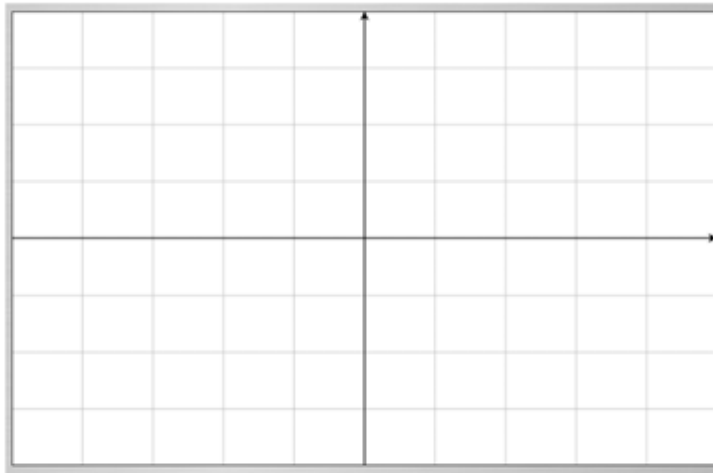


What is the resonance frequency (in Hz) of this circuit?

**(1 mark)**

**Question 4**

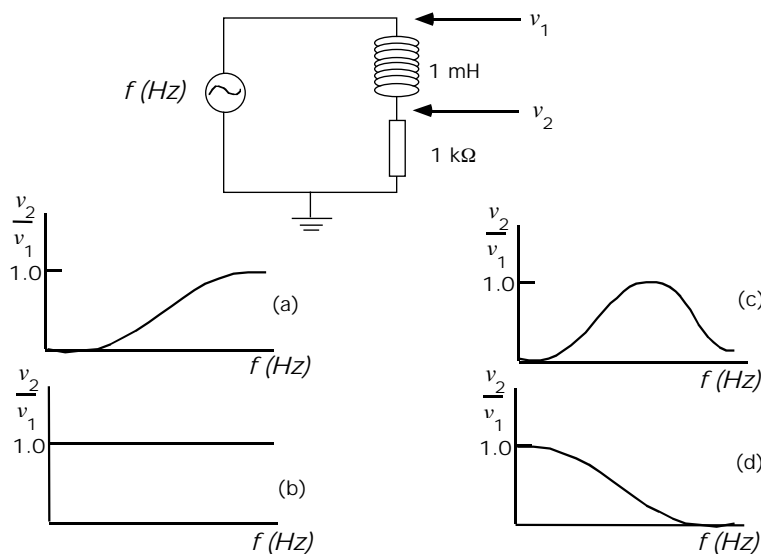
Sketch the waveform you might see on the screen of an oscilloscope if the signal into the oscilloscope is sinusoidal, with a frequency of 100 Hz and an amplitude of 5.0 V, and the settings on the oscilloscope are 5 V/div and 2 ms/div.



**(2 marks)**

**Question 5**

Which of the graphs (a) to (d) best represents the ratio  $\frac{v_2}{v_1}$  vs  $f$  in this circuit?



The graph which best represents the ratio  $\frac{v_2}{v_1}$  vs  $f$  is

**(1 mark)**