Physics
Leaving Certificate
Higher Level

Past Exam Questions on
Applied Electricity

Q5 Part (j) (ii) Section B 2008

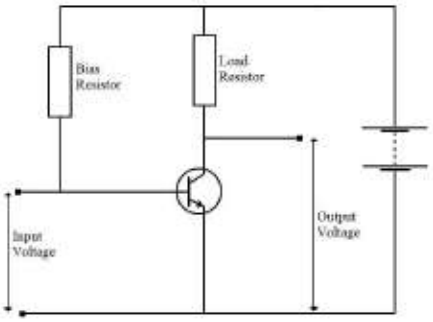
Draw a diagram to show how a galvanometer can be converted into a voltmeter. (7)

(charge on electron = 1.6×10^{-19} C)

Q10 Part (b) Section B 2008

(*b*) The transistor was one of the most important inventions of the twentieth century.
Draw the basic structure of a bi-polar transistor.
Name the three currents flowing in a transistor
State the relationship between them. (15)

The diagram shows the circuit of a voltage amplifier.
What is the purpose of:
(i) the bias resistor;
(ii) the load resistor? (12)



A varying voltage is applied to the amplifier.
Draw a sketch of the input and output voltages, using the same axes and scales. (9)

A NOT gate is a voltage inverter.
Draw a circuit diagram to show how a transistor can be used as a voltage inverter.
Give the truth table of a NOT gate. (20)

Q5 Part (j) (ii) Section B 2007

Draw the basic structure of a bi-polar transistor. (7)

Q1 Section A 2006

1. In investigating the relationship between the period and the length of a simple pendulum, a pendulum was set up so that it could swing freely about a fixed point. The length *l* of the pendulum and the time *t* taken for 25 oscillations were recorded. This procedure was repeated for different values of the length.

The table shows the recorded data.

l/cm	40.0	50.0	60.0	70.0	80.0	90.0	100.0
t/s	31.3	35.4	39.1	43.0	45.5	48.2	50.1

The pendulum used consisted of a small heavy bob attached to a length of inextensible string.
Explain

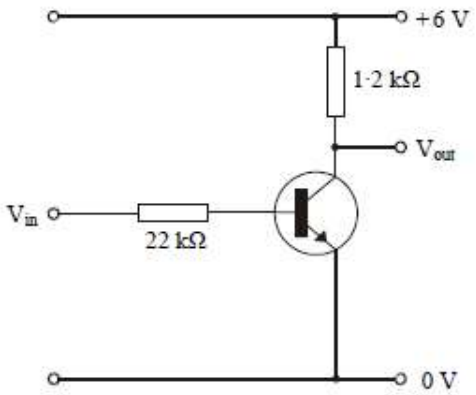
(i) why a small heavy bob was used;
(ii) why the string was inextensible. (9)

Describe how the pendulum was set up so that it swung freely about a fixed point.
Give one other precaution taken when allowing the pendulum to swing. (7)

Draw a suitable graph to investigate the relationship between the period of the simple pendulum and its length. What is this relationship? Justify your answer. (24)

Q10 Part (b) Section B 2006

(b) What is a transistor? Describe the structure of a bipolar transistor. (12)



The circuit diagram represents a voltage inverter.

What is the function of each resistor in the circuit? (6)

Explain why the output voltage is almost 0 V when the input voltage is 6 V. (12)

Calculate the collector current when the input voltage is 6V. (Assume that the output voltage is 0 V). (9)

A voltage inverter is also a NOT gate.

Draw the symbol and truth table for a NOT gate. (12)

What is the significance of the work of George Boole in modern day electronics? (5)