Level 2 Technology, Components and Circuits (7267-421)

e-Quals
Assignment guide for Candidates
Assignment A

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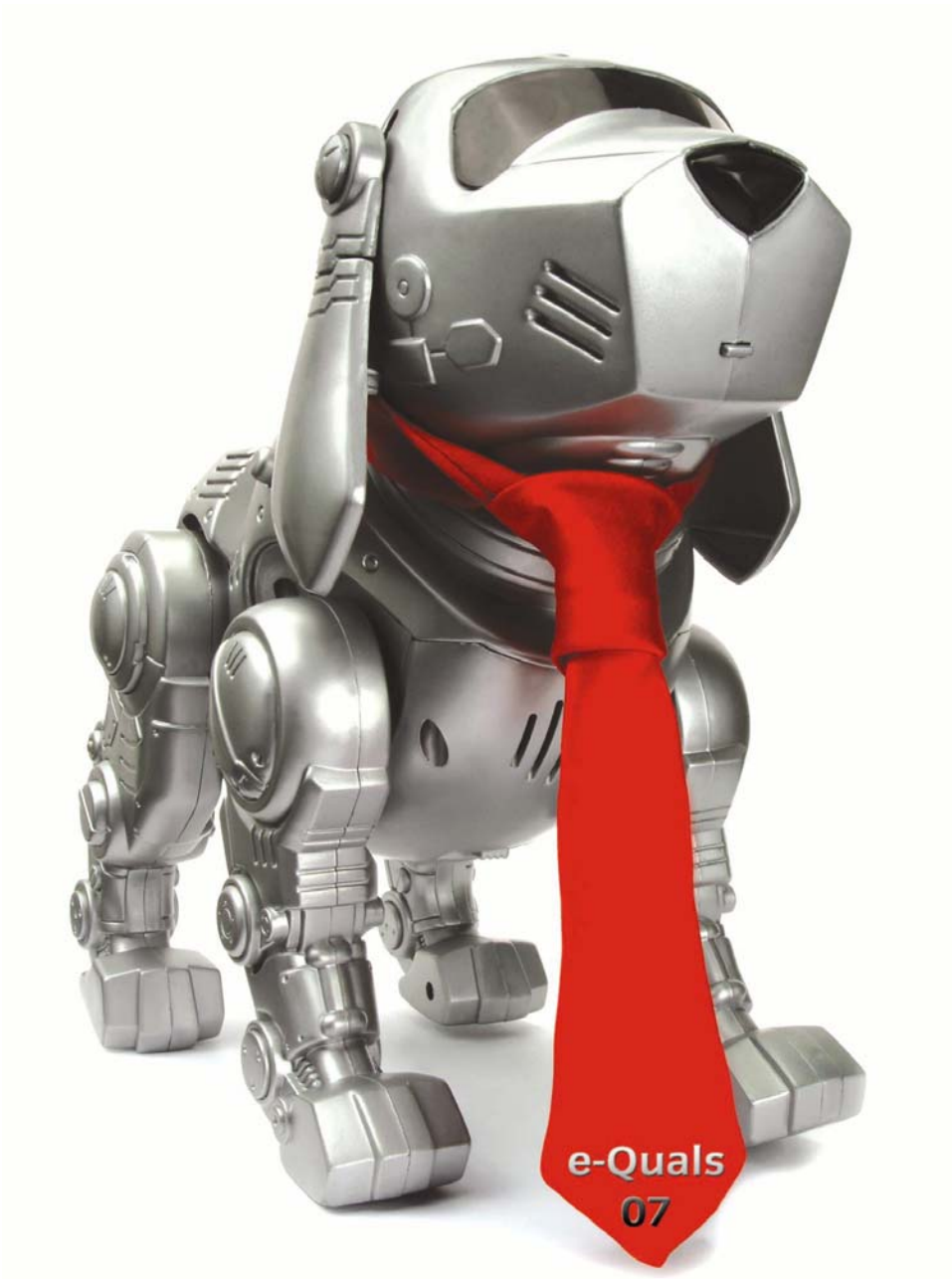
January 2010
Version 1.0



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Level 2 Technology, Components and Circuits (7267-421) Assignment A

Introduction – Information for Candidates

About this document

This assignment comprises all of the assessment for Level 2 Technology, Components and Circuits (7267-421).

Health and safety

You are asked to consider the importance of safe working practices at all times.

You are responsible for maintaining the safety of others as well as your own. Anyone behaving in an unsafe fashion will be stopped and a suitable warning given. You will **not** be allowed to continue with an assignment if you compromise any of the Health and Safety requirements. This may seem rather strict but, apart from the potentially unpleasant consequences, you must acquire the habits required for the workplace.

Time allowance

The recommended time allowance for this assignment is **four hours**.

Level 2 Technology, Components and Circuits (7267-421)

Candidate instructions

Time allowance: 4 hours

Assignment set up:

This assignment is made up of **six** tasks

- Task A – IEC socket to mains supply plug lead construction
- Task B – BNC to coaxial plug cable construction
- Task C – Circuit assembly
- Task D – Circuit measurements and calculations
- Task E – Health and Safety
- Task F – Multiple-choice questions

Task A – IEC socket to mains supply plug lead construction

You are to make up a mains supply lead comprising of a suitable mains supply plug, a length of mains supply flexible cable and an IEC socket.

1 Select and record the tools needed to carry out this task.

2 Prepare each end of the mains cable for connection to the IEC socket and mains supply plug.

3 Prepare the IEC socket and make the cable connections.

4 Inspect and reassemble the IEC socket.

5 Prepare the mains supply plug and make the cable connections.

6 Inspect and reassemble the mains supply plug.

Q1 Using a component catalogue or other reference material, find and record a part number for the connectors and cable used.

7 Carry out continuity tests on each conductor, and insulation resistance tests between the conductors, and record the results.

Task B – BNC to coaxial plug cable construction

You are to make up a coaxial signal supply lead comprising of a coaxial plug, a length of coaxial cable and a BNC plug.

1 Select and record the tools needed to carry out this task.

2 Prepare one end of the cable for connection to the coaxial plug.

3 Prepare the coaxial plug.

4 Connect the cable to the coaxial plug.

5 Prepare the other end of the cable for connection to the BNC plug.

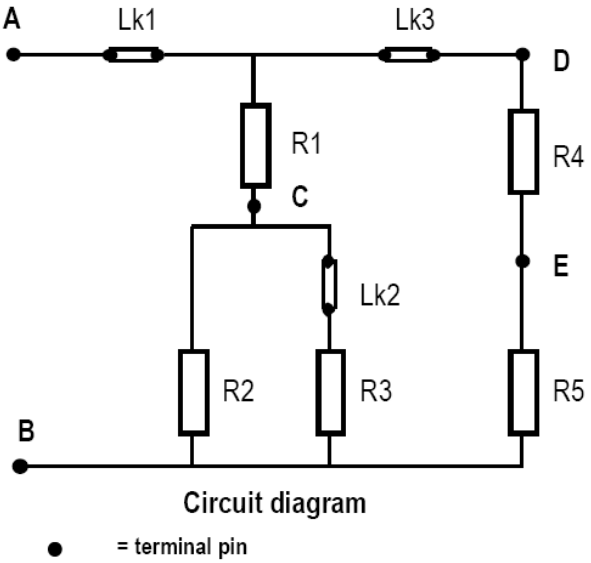
6 Connect the cable to the BNC plug.

7 Carry out the continuity tests on each conductor, and insulation resistance tests between the conductors, and record the results.

Task C – Circuit assembly

You are to assemble a simple circuit on stripboard.

1 For the circuit diagram given below, design a circuit layout on the grids provided, ready for construction.



Circuit diagram

● = terminal pin

Components

Stripboard

Terminal pins (11)

Tinned copper wire

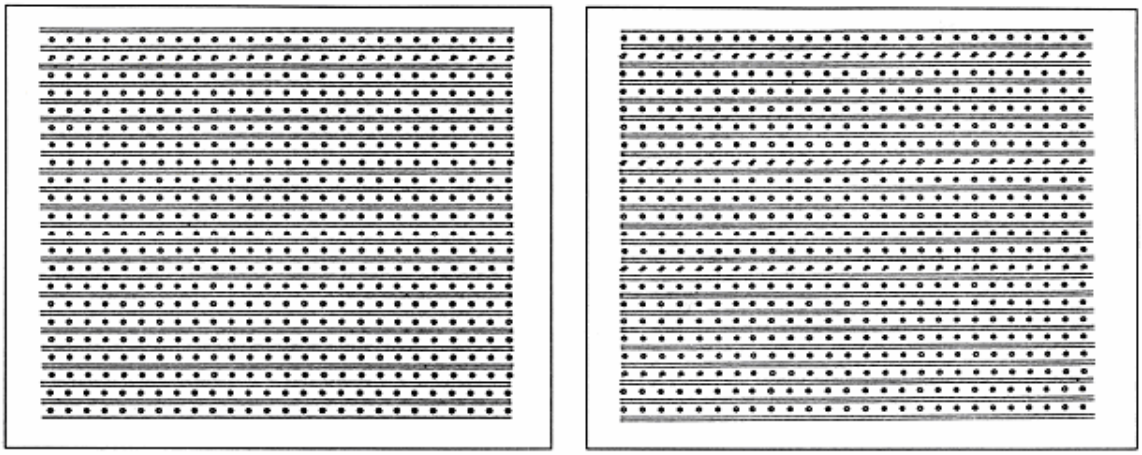
Resistors	R1	100R
	R2	120R
	R3	270R
	R4	1k8
	R5	180R

Label

Take care! Your diagram should show the position of the components and wires on the side of the board on which they will be mounted, ie the plain side. Do not forget that when working on the copper strip side, the layout will be a mirror image.

Remember:

- The copper strip will need to be cut in certain places. Show this by an x on your diagram.
- Copper strips will need to be linked (with the tinned copper wire). Show these connections on the diagram.
- Clearly mark the component numbers against the components on the diagram.



Submit your diagram for approval by your assessor before proceeding.

2 Select and record the necessary tools to construct the circuit.

3 Construct the circuit in accordance with the circuit diagram and your approved layout. Write your name on the label and attach it to the stripboard.

Task D – Circuit Measurements and calculations

You are to carry out measurements on the circuit you constructed in Task C. You will be given a low voltage d.c. power supply and a multimeter. You will need a soldering iron to open and close the links as directed.

1 Open Lk3 and, using the multimeter, measure the resistance between pins:

- C and B
- D and B.

2 Close Lk3 and measure the resistance between pins A and B.

3 Using the multimeter, set the output of the d.c. power supply to 5 volts and connect the supply to circuit pins A (positive) and B (negative). Measure the voltage across pins:

- A and C
- C and B
- D and E
- E and B.

4 Disconnect the power supply from the circuit and open Lk1. Reconnect the power supply and check that it is still set to 5 volts. Using the multimeter, measure the total current drawn by the circuit.

5 Disconnect the power supply, remake Lk1 and open Lk2. Reconnect the power supply and check that it is still set to 5 volts. Using the multimeter, measure the current flowing in R3.

6 Calculate each of the following. Show your results and all working on your answer sheet:

- Resistance of R2 and R3 in parallel.
- Resistance of R4 and R5 in series.
- Total circuit resistance (between A and B).

For the following, assume that a 5 volt supply is connected to the circuit:

- Voltage across R4.
- Voltage across R5.
- Current in R1.
- Current in R2.
- Power dissipated in R1.
- Total power dissipated by the circuit.

Task E – Health and Safety

With regard to the Health and safety regulations in your college or training centre, answer the following questions.

Q1 State an example of a safe working practice with respect to each of the following:

- Act safely and responsibly.
- Work safely and responsibly.
- Be aware of the safety of others.

Q2 State **two** actions to be taken for each of the following events:

- Hearing the fire alarm.
- Discovering a fire.

Q3 Draw a plan of an electrical/electronics workshop. Show on the plan any doors and windows, and indicate the position of each of the following:

- Electrical mains breaker switch.
- Fire extinguishers.
- Fire blanket.
- Fire alarm.

Task F – Multiple-choice questions

Your assessor will now give you a multiple-choice answer sheet containing **four** multiple-choice questions. Answer **all** of the questions and hand your answer sheet back to your assessor.

When you have finished working:

- Sign each document above your name and label all removable storage media with your name.
- Hand all paperwork and removable storage media to your assessor.

If the assignment is taken over more than one period, all paperwork and removable media must be returned to the test supervisor at the end of each sitting.

End of assignment

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