Level 2 Digital Electronics 2 (7267-425)

e-Quals
Assignment guide for Candidates
Assignment A

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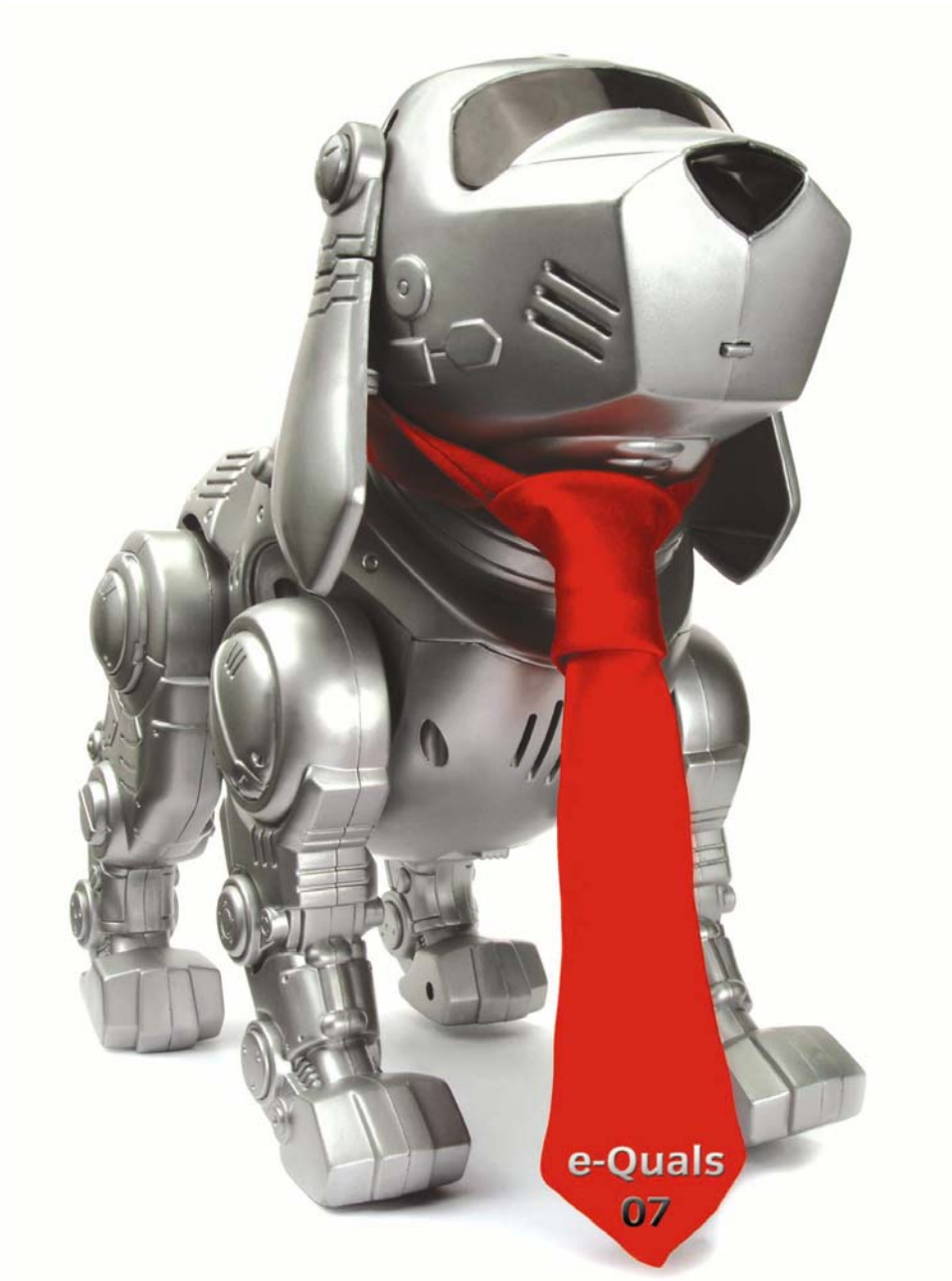

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Level 2 Digital Electronics 2 (7267-425) Assignment A

Introduction – Information for Candidates

About this document

This assignment comprises all of the assessment for Level 2 Digital Electronics 2 (7267-425).

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 **4 hours**.

Level 2 Digital Electronics 2 (7267-425)

Candidate instructions

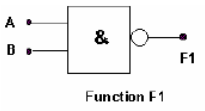
Time allowance: 4 hours

Assignment set up:

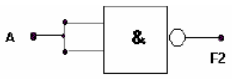
This assignment is made up of **five** tasks

- Task A – Combinational logic
- Task B – Logic systems– 555 timer multivibrator
- Task C – Digital circuitry measurements
- Task D – Health and Safety
- Task E – Multiple-choice questions

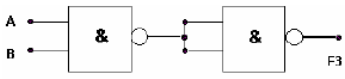
Task A – Combinational logic



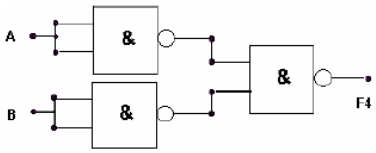
Function F1



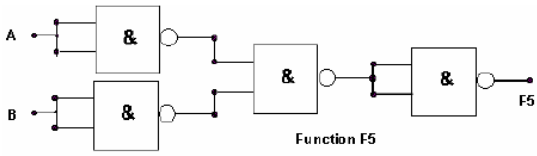
Function F2



Function F3



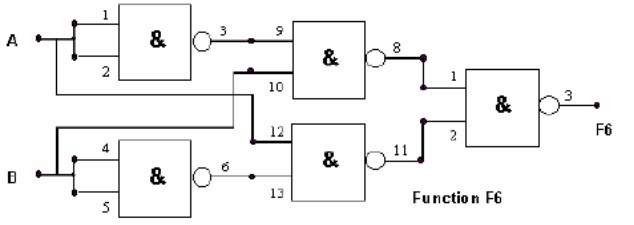
Function F4

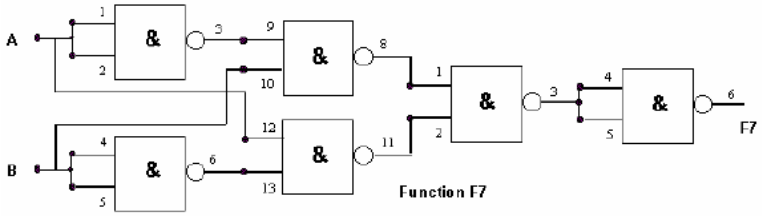


Function F5

1 For each of the circuits labelled Function F1, F2, F3, F4 and F5 above, determine and record the truth table.

2 From the truth tables, determine the logic function for each circuit.





You will be provided with

- two 7400 QUAD 2-input NAND gates
- a prototyping board
- a suitable wire to form jumper links
- a 5V d.c. power supply
- a logic probe.

3 Construct the circuit as shown in Function F6 above, and check with your assessor that the circuit is correct before proceeding.

4 Test the circuit by applying all input combinations while using the logic probe to monitor the output and so construct a truth table for the circuit.

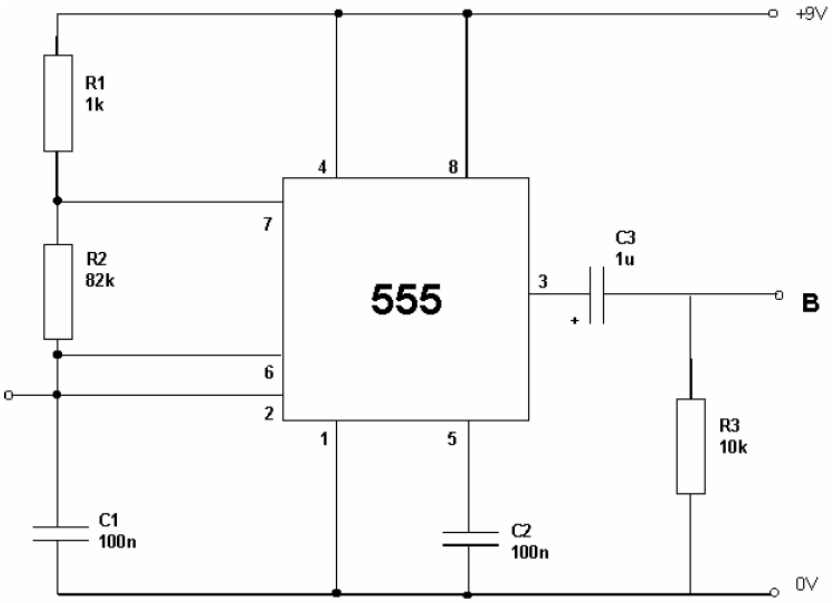
5 Determine and record the overall logic function of the circuit.

6 Repeat Tasks A3 to A5 for the circuit shown in Function F7 above.

Task B – Logic systems– 555 timer multivibrator

You will be provided with:

- a 555 timer IC circuit (below)
- a 9V d.c. power supply
- a multimeter
- an oscilloscope.



1 Connect the circuit to the power supply and use the multimeter to measure each of the following:

- The current taken by the circuit.
- d.c. voltage at pin 7 of the IC.
- a.c. voltage at pin 6 of the IC.

2 Connect the oscilloscope to test point B and sketch two cycles of the waveform on graph paper or other suitable media and scale the axes.

3 For the waveform at test point B, calculate each of the following:

- Peak-to-peak voltage.
- Periodic time.
- Frequency.

4 State whether the circuit is astable, monostable or bistable.

Task C – Digital circuitry measurements

You will be provided with:

- a digital circuit board (with circuit diagram)
- a suitable low voltage d.c. power supply
- an oscilloscope.

1 Connect the digital circuit board to the power supply. Measure and record the frequencies at the two points as specified by your assessor.

2 Connect the oscilloscope to a further point specified by your assessor and sketch two cycles of the waveform on graph paper or other suitable media and scale the axes.

3 From the observed waveform, determine each of the following:

- Periodic time.
- Frequency.
- Mark/space ratio.

Task D – Health and Safety

With regard to health and safety at work, answer the following questions.

1 List **three** negative attitudes which contribute to accidents at work.

2 List **three** positive attitudes that prevent accidents and injury at work.

3 Define each of the following terms:

- Hazard.
- Risk.

4 State **three** examples of the use of protective clothing and equipment when carrying out electronic product assembly.

Task E – 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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