



January and June 2015

PRINCIPAL LEARNING LEVEL 2 ENGINEERING

F552 Construct Electronic and Electrical Systems

Candidates answer on the Work Book.

OCR supplied materials:
None

Other materials required:

- Electronics components and equipment

Duration: 6 hour(s)
in three 2-hour sessions



Candidate forename		Candidate surname	
-----------------------	--	----------------------	--

Centre number						Candidate number				
---------------	--	--	--	--	--	------------------	--	--	--	--

Date of challenge

Session 1

Session 2

Session 3

INSTRUCTIONS TO CANDIDATES

Write the name of your Design Challenge below:

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Complete **all** the tasks.

INFORMATION FOR CANDIDATES

- The total number of marks for this paper is **30**.
- This document consists of **12** pages. Any blank pages are indicated.

INSTRUCTIONS TO CENTRES

- It is essential that centres follow the instructions printed in the Information for Presenters booklet to ensure the correct conduct for running this Design Challenge is followed.
- The activity is designed to take place in a design room, studio or workshop (not the centre's examination room/hall).

		Centre Mark	Mod Mark
Task 1	6		
Task 2	6		
Task 3	12		
Task 4	6		
TOTAL	30		

Session 1	Tasks 1 and 2	2 hours
<p>Apply your knowledge of electronic and electrical principles to design possible solutions to the 'Design Challenge' you have been given.</p>		
<p>On this page record your initial thoughts on input, control, output and feedback.</p>		

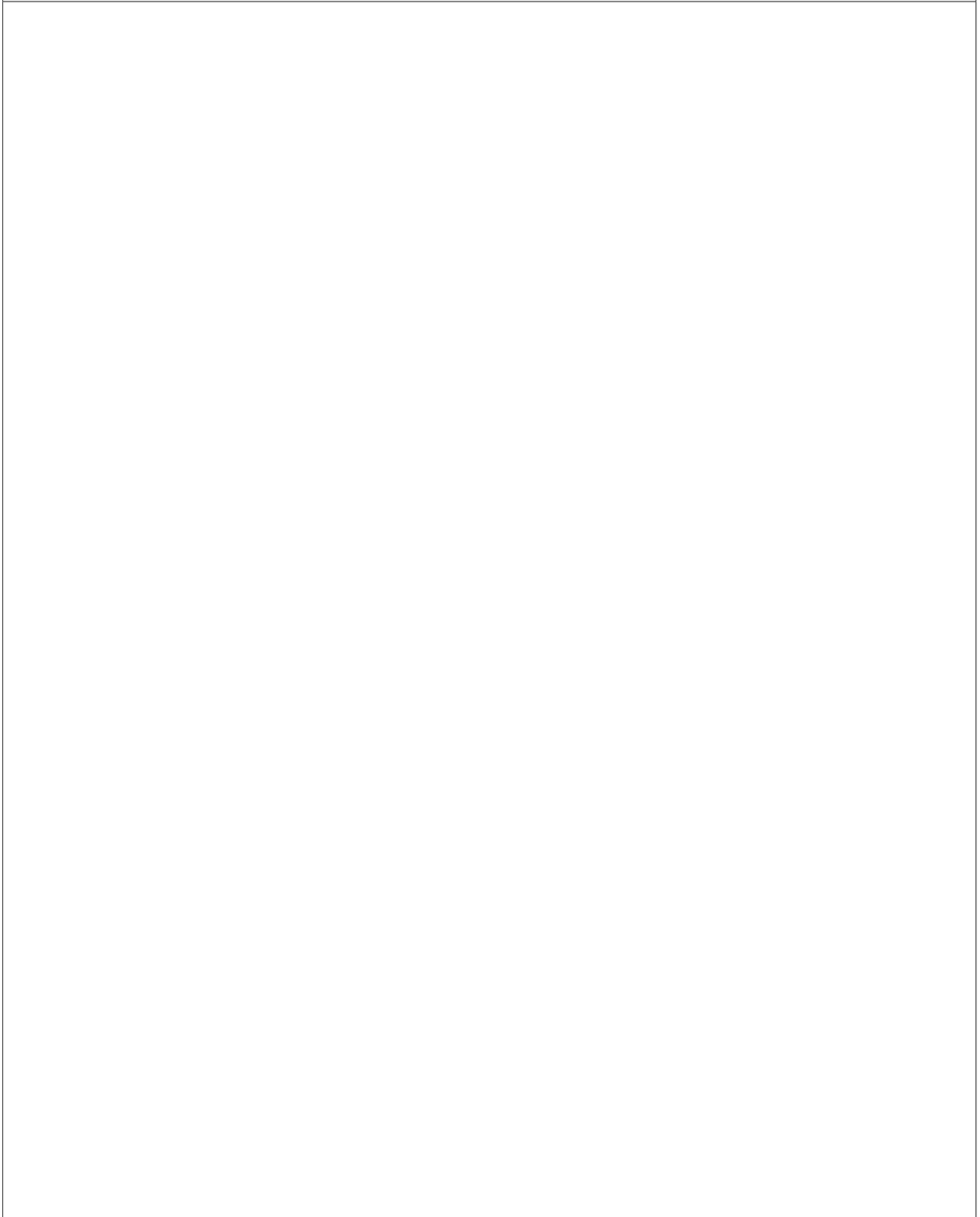
Task 1 (continued) Complete the table below to show safe working procedures (risk assessment) that are appropriate to your selected circuit designs.

Control (action to control hazard)	
Hazard	
Process	

Task 1 Total 6 Marks	Centre Mark	Mod Mark

Task 2 Draw and annotate a circuit diagram of your proposed circuit design.

Initial Circuit Diagram



Task 2 (continued) Give reasons for your selection of appropriate components to construct your circuit.	
Show calculations used to select component values	
Operating Principles	
Components considered	

Task 2 Total 6 Marks	Centre Mark	Mod Mark

Session 2	Task 3 Part 1	2 hours
<p>NB. At the end of this session you are permitted to produce a circuit board before Session 3 – you will need a second copy of your final circuit diagram to allow you to do this. From your circuit diagram construct a prototype using at least two of the following techniques: soldering, stripboards, protoboards, breadboards, CAD.</p>		
Circuit Diagram	Photographs of Prototype Circuits	
	Photograph 1	
	Photograph 2	
	Photograph 3	

Draw and annotate your final circuit diagram. Additional photographs can be attached to page 11

Final Circuit Diagram

Session 3

Task 3 Part 2

1 hour

Construct your final circuit

Photographs of completed final solution

Photograph 1 (component side)

Photograph 2 (track/connection side)

Task 3 Total 12 Marks	Centre Mark	Mod Mark

Session 3	Task 4	1 hour
Task 4 Identify and justify appropriate testing, test equipment and fault finding methods. Use them to test your circuit.		
<p style="text-align: center;">Photograph of Test Method 1</p>		Justification
Outcome		
<p style="text-align: center;">Photograph of Test Method 2</p>		Justification
Outcome		

Suggest modifications, using calculations that will improve your circuit design.

Task 4 Total 6 Marks	Centre Mark	Mod Mark

Additional photographs and other supporting material:

**Copyright Information**

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact the Copyright Team, First Floor, 9 Hills Road, Cambridge CB2 1GE.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.