

January and June 2012

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	
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Centre number						Candidate number				
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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>		

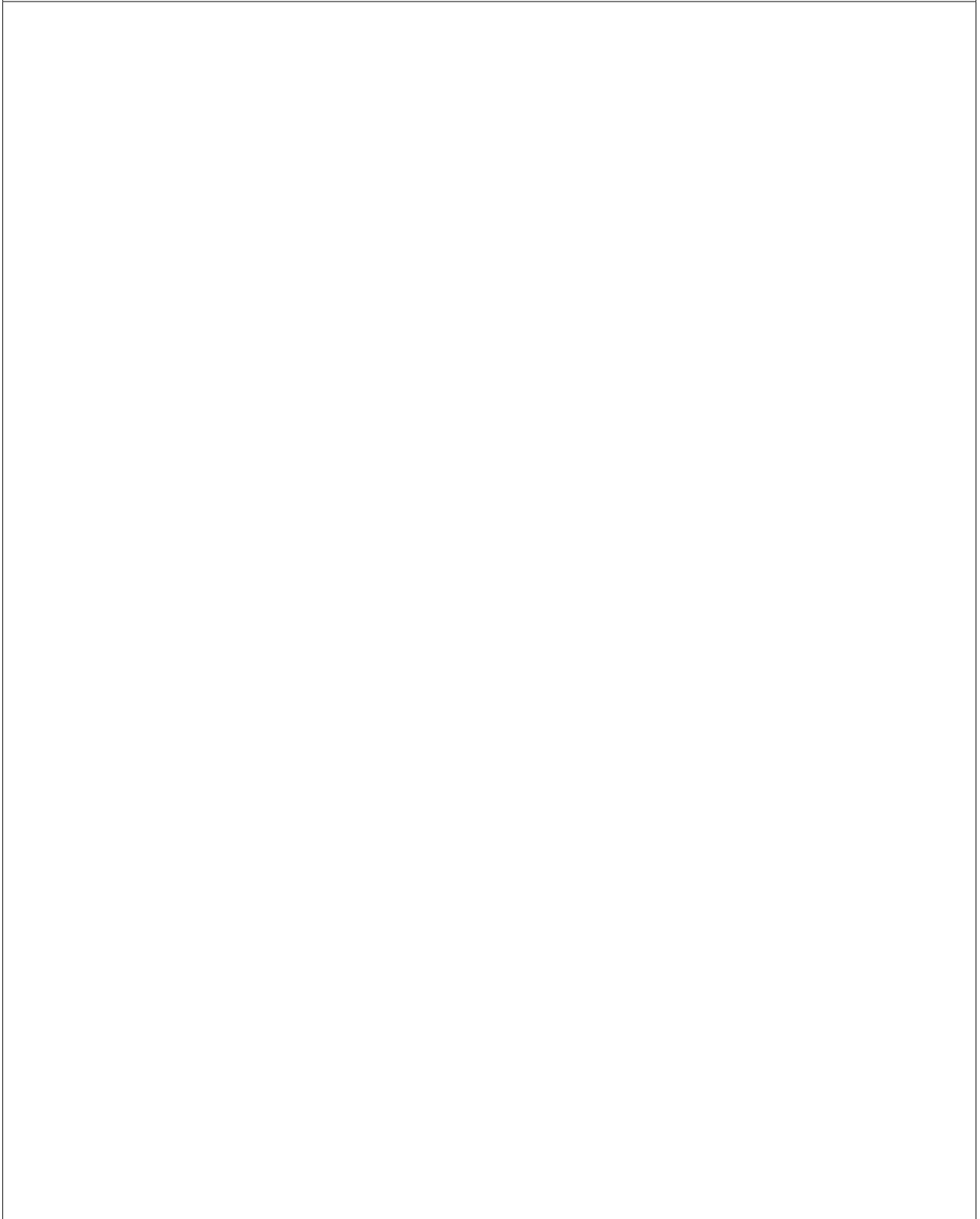
Task 1 (continued) Complete the table below to show safe working procedures (risk assessment) that are appropriate to your selected circuit designs.

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:

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