



General Certificate of Secondary Education

Design and Technology (Resistant Materials Technology) Higher Tier (3545/H) Full Course

For Publication

Mark Scheme

2007 examination - June series

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this Mark Scheme are available to download from the AQA Website: www.aqa.org.uk

Copyright © 2007 AQA and its licensors. All rights reserved.

COPYRIGHT

AQA retains the copyright on all its publications. However, registered centres for AQA are permitted to copy material from this booklet for their own internal use, with the following important exception: AQA cannot give permission to centres to photocopy any material that is acknowledged to a third party even for internal use within the centre.

Set and published by the Assessment and Qualifications Alliance.

(3545/F Q1)

1 Any **five** correctly identified requirements.

Possible responses:

1. Must be stylish
2. Must be soundly constructed
3. Must be capable of being manufactured in quantity
4. Must be safe to use
5. Must be easy to access computer games
6. Must be stable
7. Must be durable

5 x 1 mark

Any **five** relevant explanations

Possible responses:

1. You are more likely to sell a stylised design
2. The storage system must be capable of robust use
3. This will ensure that the price is kept low and the quality kept high
4. No one should injure themselves when using the storage system
5. This is the basic function of the design
6. If it is difficult to use customers will not buy it
7. If it falls over it could injure some one or break the CD cases
8. The customer will want the product to last for a few years

5 x 1 mark

10 marks

(3545/F Q2)

2 Quality of sketches

Quality 3D rendered sketches with colour *5 - 6 marks*

Quality line sketches or an attempt at 3D sketches *3 - 4 marks*

Simple line sketching *1 - 2 marks*

Quality of notes

Detailed explanations *3 marks*

Simple explanations *2 marks*

Labelling *1 mark*

Design Ideas

Mark **each** idea separately against the following scheme:

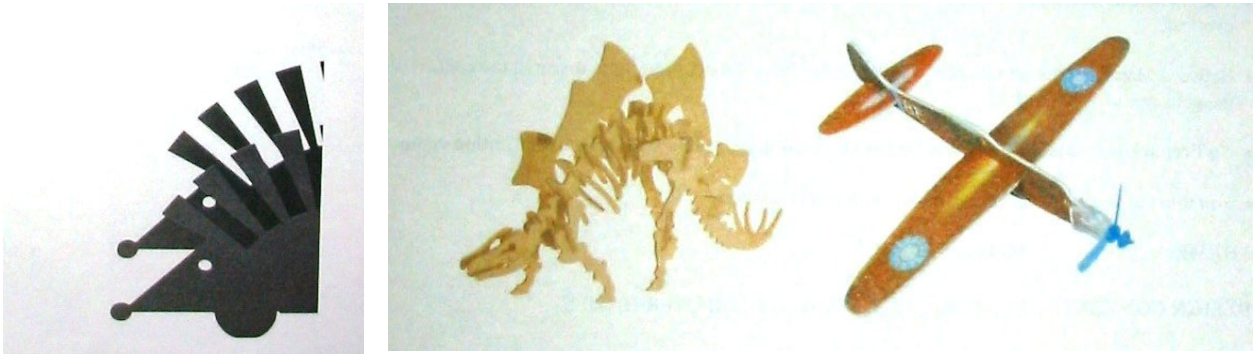
An excellent idea which fulfils the design brief, specification and the given situation. *5 - 6 marks*

A good idea which fulfils most of the design brief, specification and the given situation. *3 - 4 marks*

A simple idea which fulfils some of the design brief, specification and the given situation. *1 - 2 marks*

Give away product

- A give away product which is themed to the computer magazine and shows originality *3 marks*
- A give away product which shows originality *2 marks*
- A simple give away product *1 mark*
- A copy of the glider, dinosaur or hedgehog from the preparation sheet *0 marks*



Quality of Evaluation

Award up to **two** marks for **each** evaluation using the following scale:

- Evidence of analytical thinking *2 marks*
2 or more points considered
1 point considered *1 mark*

33 marks

3 Quality of sketches

- Quality 2D or 3D sketches *2 marks*
- Simple 2D sketches *1 mark*

Quality of notes

- Detailed notes *2 marks*
- Labelling *1 mark*

Method of manufacture

Batch production

Look for details relating to:

- Injection moulding
- Vacuum forming
- Blow moulding
- Jigs / Formers / Moulds
- CAM / CNC / CIM
- Printing, pressing/cutting of card solutions

A suitable and very detailed method of manufacture. *9 - 10 marks*

A suitable and detailed method of manufacture. *7 - 8 marks*

A suitable method of manufacture, some detail given. *5 - 6 marks*

A suitable method of manufacture, limited detail given. *3 - 4 marks*

A suitable method of manufacture with vague details given. *1 - 2 marks*

One off production

Look for details relating to:

A suitable and detailed method of construction. *4 marks*

A suitable method of construction, with some inaccuracies. *3 marks*

Incorrect method of construction, but would function. *2 marks*

Incorrect method of construction, little chance of success. *1 mark*

14 marks

- 4 (a) Award **one** mark for **three** correctly identified types of market research.
(i)

Possible responses:

- Asking consumers to complete a questionnaire
- Carrying out an interview with potential customers
- Having a telephone conversation with a potential customer
- Emailing potential customers
- Go onto internet
- Books/magazines
- Talk to focus groups
- Look at existing products

3 x 1 mark

- (a) Award up to **two** marks for a correct explanation.
(ii)

Possible responses:

- To find out the consumers' preferences
- To find out if there is a demand for the product

2 x 1 mark

- (b) Award **one** mark for **three** correctly identified methods of advertising.
(i)

Possible responses:

- On TV
- On the radio
- Via the newspaper
- Via magazines
- Via email
- Via the telephone
- Via a flier
- Posters/billboards
- Internet/pop-ups

3 x 1 mark

- (b) Award up to **two** marks for a correct explanation.
(ii)

Possible responses:

- To make consumers aware of the product
- To improve sales of the product

2 x 1 mark

10 marks

- 5 (a) Award **one** mark **each** for **three** correct ways of using ICT to help research a design.

Possible responses:

Interrogating a CD Rom database.
By using a word processing package.
By using the internet
By using e-mail
By using video conferencing
By using a fax machine
By using a mobile phone
By using a digital camera
By using a scanner
By using wikipedia

3 x 1 mark

Award **one** mark **each** for **three** suitable explanations.

3 x 1 mark

- (b) Award up to **two** marks for a description of the term CIM

Possible responses:

Computer integrated manufacture is the linking together of all the different stages in designing and manufacturing a product.

2 marks

- (c) Award up to **five** marks for a suitable explanation.

Look for details relating to:

- Allows designs to be changed
- Allows materials to be changed
- Allows manufacturing processes to be changed
- Reduces the cost of changing a product
- Reduces the time it takes to change a product
- Avoids confusion
- Allows JIT (Just in time) concept to be employed
- Allows traceability of components

5 x 1 mark

13 marks

(3545/F Q5)

6 (a) Award **one** mark for **each** correctly entered cell.

Personal safety equipment	Name	Process	Hazard
A	<i>Ear defenders</i>	<i>Any process where there is excessive noise</i>	<i>The noise is too loud and could harm your hearing</i>
B	<i>Goggles</i>	<i>Any process where there is potential for damage to the eyes</i>	<i>Something could damage your eyes</i>
C	<i>Dust mask</i>	<i>Any process where there is potential for damage to the respiratory system</i>	<i>You could inhale dust/fumes.</i>

9 marks

(b) Award **one** mark each for details relating to:

- The use of CAM means less employees come into contact with machinery
- CAM can perform hazardous tasks
- CAM can work in dangerous environments
- CAM can work without becoming tired
- CAM eliminates human error

3 x 1 mark

12 marks

(3545/F Q6)

7 (a) Remote control holder A

Award **one** mark for a suitable specific wood/manufactured board.

Possible responses:

- pine
- beech
- oak
- ash
- mahogany
- plywood

1 mark

Award **one** mark **each** for **two** correct reasons.

Possible responses:

- Attractive
- Strong
- Durable
- Capable of being bent

2 x 1 mark

Remote control holder B

Award **one** mark for any suitable specific plastic

Possible responses:

- Acrylic/Perspex PMMA
- ABS
- HIPS
- Polycarbonate PC
- Polypropylene PP
- HDPE
- PVC
- Glass

1 mark

Award **one** mark **each** for **two** correct reasons.

Possible responses:

- Immaculate surface finish
- Transparent
- Ideal for quantity production
- Durable

2 x 1 mark

Remote control holder C

Award **one** mark for any suitable specific metal.

Possible responses:

- Steel
- Aluminium

1 mark

Award **one** mark **each** for **two** correct reasons.

Possible responses:

- Good strength to weight ratio
- Durable
- Cost (inexpensive, mild steel)
- Light (aluminium)

2 x 1 mark

(b) **Remote control holder C**

Award **one** mark each for **two** suitable surface finishes

Possible responses:

- Gloss paint
- 'Hammerite'
- 'Smoothrite'
- Powder / plastic coating
- Anodised (aluminium only)
- Galvanising (steel)
- Cellulose paint/spray/lacquer
- Polishing (aluminium/stainless steel)
- Brushed/engine turning

2 x 1 mark

11 marks

8 Award **one** mark each for **four** improved features of the drill

Look for the following details:

- There is no cord
- There is no chuck key
- It can be used as a powered screwdriver
- It is battery powered
- It has a comfortable grip
- It is portable
- It will not electrocute you
- It is balanced
- It is free standing
- It has a torque converter

4 x 1 mark

Award up to **two** marks for details relating to the benefits of **each** improvement

4 x 2 marks

12 marks

- 9 (a) Award up to **two** marks for a suitable method of ensuring the shape remains the same.

Possible responses:

- Use of a template
- Use of a jig
- Use of CAM (laser cutter)
- Use of double sided sticky tape
- Allow details relating to checking process

2 x 1 mark

- (b) Award up to **two** marks for a suitable method of ensuring the angle remains the same.

Possible responses:

- Use of a jig
- Use of a mould
- Use of a former
- Use of a press
- Use of line bender/strip heater with bending jig
- Allow details relating to checking processes

2 x 1 mark

- (c) Award up to **six** marks for a suitable explanation of the importance of carrying out quality control checks.

Look for the following details:

- Higher quality product
- Greater consistency of product/tolerance
- An assurance of quality/meeting standards
- Reduction in faulty products
- Cost effective
- Greater customer satisfaction
- Inter-changeability of components

6 x 1 mark

10 marks