ASSESSMENT and QUALIFICATIONS ALLIANCE

Mark scheme June 2003

GCSE

Design and Technology Resistant Materials Technology

3555 (Short Course)

Higher

The Assessment and Qualifications Alliance (AQA) is a company limited by guarantee registered in England and Wales 3644723 and a registered charity number 1073334
Registered address: Addleshaw Booth & Co., Sovereign House, PO Box 8, Sovereign Street, Leeds LS1 1HQ
Kathleen Tattersall: *Director General*

Design and Technology: Resistant Materials Technology

Short Course Higher Tier

Question 1

Any **two** correct ways of using ICT to help design the workstation.

Possible responses:

.

xi) Interrogating a CD Rom database.
xii) By using a word processing package.
xiii) By using a spreadsheet
xiv) By using a graphics software package.
xv) By using e-mail
xvi) By using video conferencing
xvii) By using a fax machine
xviii) By using a mobile phone
xix) By using a digital camera
xx) By using a scanner
xxi) By using the internet (2 x 1 mark)

Two correct explanations

Possible responses:

xi) To gain information about materials
xii) To produce a letter requesting information from someone
xiii) To calculate the cost of materials
xiv) To sketch out designs
xv) To communicate with a manufacturer
xvi) To communicate with a group of people
xvii) To send a letter quickly to someone
xviii) To telephone someone for information
xix) To photograph the manufacture if a project
xx) To copy an image for use in a design folder
xxi) To gain information about materials (2 x 1 mark)

Total 4 marks

Question 2

Any **three** correctly identified requirements.

Possible responses:

- Must be soundly constructed
- Must securely hold the computer and all the accessories
- Must be comfortable to sit at
- Must be capable of being manufactured in quantity
- Must be safe to use
- Must fit into the home environment
- Must allow easy access to the computer and its accessories
- Must be capable of home assembly
- Must be a flat pack construction
- Must be an interesting design
- Must have a flat work area
- Must accept a wheelchair
- Must have a table which will rise / fall by 100mm
- Environmental issues (3 x 1 mark)

Three correct explanations (3 x 1 mark)

Total 6 marks

Question 3

Variety of ideas

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

- An excellent idea which differs in approach or principal, fulfils the design brief and the specification (6 marks)
- A very good idea which differs in approach or principal, fulfils most of the design brief and the specification. (5 marks)
- A good idea which differs in approach or principal, fulfils some of the design brief and specification. (4 marks)
- A simple idea which differs in approach and/or Principal, fulfils some of the design brief and specification (3 marks)

- An idea which fulfils most of the design brief and specification but is similar to the other ideas. (2 marks)
- A simple idea (1 mark)

Quality of sketches

- Quality 3D/rendered sketches (4 - 5 marks)
- Quality line sketches or an attempt at 3D sketches (2 - 3 marks)
- Simple line sketching (1 mark)

Quality of notes

- Detailed explanations (2 marks)
- Simple notes (1 marks)

Quality of Evaluation

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

Good analytical thinking(3 or more points considered (2 marks)
Some evidence of analytical thinking (1 mark)
(1 or 2 points considered) (2 x 2 marks)

Total 23 marks

Question 4

(a) Joining method

A correct method of joining the mainframe together (1 mark)

(b) Marking out and Preparation

Sufficient detail for the joining method to be marked out and prepared by a third party, all tools and equipment given (3 marks)

Sufficient detail for most of the joining method to be marked out and prepared by a third party, some tools and equipment given (2 marks)

Some of the joining method could be marked out and prepared by a third party (1 mark)

Construction of the joint

Sufficient detail for the main frame to be fixed together by a third party, all tools and equipment given (4 marks)

Sufficient detail for most of the main frame to be fixed together by a third party, some tools and equipment given (3 marks)

Some of the main frame could be fixed together by a third party (2 marks)

A method of joining can be identified (1 mark)

Tools and equipment

All tools and equipment are identified (3 marks)

Most tools and equipment are identified (2 marks)

Some tools and equipment are shown (1 mark)

(d) Look for details re.

- Use of jigs, templates
- Use of fixtures
- Use of critical points
- Use of quality assurance
- Use of quality control
- Assembly hire production

For each of the above award one mark for mentioning The technique and one mark for applying it to their Chosen joint up to a maximum of 5 marks. (5 marks)

Total 16 marks

Question 5

Quality of design

Award one mark each for a design which :

- Raises and lowers the work height
- Is a workable solution
- Is easy to use
- Involves the use of a mechanism
- Involves the use of a sophisticated mechanism (5 x 1 mark)

Quality of Drawing

- Very good line drawing (3 marks)
- Good line drawing (2 marks)
- Simple line drawings (1 mark)

Quality of notes

- Explanation (2 marks)
- Labelling (1 mark)

Total 10 marks

Question 6

(a) Any **two** correctly identified safety precautions.

Possible responses:

- Ensure you are wearing goggles / glasses
- Ensure you are wearing an apron / overall
- Ensure you have the work securely clamped down
- Ensure you have the cord / flex away from the blade
- Do not place the jigsaw onto a workbench before it has come to a stop
- Dust extraction/mark/ventilation
- Ear protection
- Supervision/permission
- Keeps hand away from the cutting edge (2 x 1 mark)

Two correct explanations (2 x 1 mark)

Total 4 marks

Question 7

(a) Material

Any solid timber/cellulor based plastic (1 x 1 mark)

Reasons

- Sustainable resource
- Converts CO^2 into O^2
- Is a renewable resource
- Provides a habitat for flora and fauna
- Does not pollute the atmosphere
- Recyclable

Award one mark each for any of the above or two marks each for an answers which expand on two of the above. (4 x 1 mark)

(b) Material

- Any metal
- Any plastic
- Any manufactured board
- Mahogany (1 x 1 mark)

Reasons

- Scars the land when the raw material is extracted
- Produces toxic gases when it is refined / smelted
- Leads to acid rain
- Leads to global warming
- Leads to fertile soil being washed away
- Is non biodegradable
- Moving crude oil around the world can lead to ecological disasters when tankers get into trouble

Award one mark each for any of the above or two marks each for an answers which expand on two of the above.

(4 x 1 mark)

Total 10 marks

Question 8

(a) **Part A** - Any suitable **light** coloured hard/softwood. (1 x 1 mark)

Possible responses:

- Birch
- Beech
- Ash
- Oak
- Pine
- Sycamore
- Ramin
-

Reasons (2 x 1 mark)

- Attractive
- Strong
- Capable of being cut to shape
- Capable of being joined
- Capable of being shaped
- Relatively lightweight
- Durable
- Cost (expensive / inexpensive)

Part B

Possible responses:

- Glass
- Acrylic (1 x 1 mark)
- Polycarbonate

Reasons

- Clear
- Immaculate surface finish
- Rigid (2 x 1 mark)
- Appearance
- Low maintenance

Part D

Any suitable manufactured board with relevant applied finish (1 x 1 mark)

Reasons

Possible responses:

- Attractive
- Strong
- Stable

- Flat surface
- Available in large sizes (2 x 1 mark)

(b)(i) Possible responses:

- Varnish
- Wax
- Wood stain (1 x 1 mark)

(b)(ii) Preparing the framework

Possible responses:

- Glass papering the surface
- Clean off the dust
- Brushing/ spraying the finish
- Rubbing down the first coat
- Applying a second coat

Award one mark each for any of the above or two marks each for an answers which expand on two of the above. (4 x 1 mark)

Naming the tools and equipment

All tools and equipment named or sketched (2 marks)
Most tools and equipment named or sketched (1 mark)

Quality of notes and sketches

Good quality notes and sketches (2 marks)
Simple labelling and sketches (1 mark)

(b) Reference should be made to a mechanised/CAM system

Possible responses:

- Spray booth with conveyor belt
- CNC robotic arm
- Electrostatic spraying

Detailed explanation 5 - 4 marks
Good explanation 3 - 2 marks
Simple explanation 1 mark

Total 23 marks

Question 9

Possible reasons:

- To speed up the manufacturing process
- To reduce the unit cost of manufacturing the display cabinet
- To produce a higher quality product
- To improve the consistency of each product
- To employ less skilled labour
- A less skilled process

Award one mark each for any of the above (2 x 1 mark)

Two correct explanations (2 x 1 mark)

Total 4 Marks

Total Paper 100 Marks