

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**  
**GCE Advanced Subsidiary Level and GCE Advanced Level**

## **MARK SCHEME FOR the June 2002 question papers**

### **9705 Design and Technology**

**9705 /1** Paper 1 (Written 1), maximum raw mark 60

**9705 /3** Paper 3 (Written 2), maximum raw mark 60

These mark schemes are published as an aid to teachers and students, to indicate the requirements of the examination. They show the basis on which Examiners were initially instructed to award marks. They do not indicate the details of the discussions that took place at an Examiners' meeting before marking began. Any substantial changes to the mark scheme that arose from these discussions will be recorded in the published *Report on the Examination*.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes must be read in conjunction with the question papers and the *Report on the Examination*.

- CIE will not enter into discussions or correspondence in connection with these mark schemes.

CIE is publishing the mark schemes for the June 2002 question papers for most IGCSE, Advanced Subsidiary (AS) Level and Advanced Level syllabuses.



UNIVERSITY of CAMBRIDGE  
Local Examinations Syndicate

**JUNE 2002**

**GCE Advanced Subsidiary Level**

**MARK SCHEME**

**MAXIMUM MARK : 60**

**SYLLABUS/COMPONENT :9705 /1**

**DESIGN AND TECHNOLOGY  
(WRITTEN 1)**

|        |                                   |          |       |
|--------|-----------------------------------|----------|-------|
| Page 1 | Mark Scheme                       | Syllabus | Paper |
|        | AS Level Examinations – June 2002 | 9705     | 1     |

### Section A

|   |   | Detail Mark   | Mark on script | Total Mark |
|---|---|---------------|----------------|------------|
| 1 | a) Suitable example – hand-built customer specification furniture. Often designer/craftsman manufactured.   | 2 x 1         | 2              |            |
|   | b) Suitable example – die cast model cars. Number of components made in groups, then assembled. Production in a series of single sep. operations. | 2 x 1         | 2              |            |
|   | c) Suitable example – the motor car. Large volume production. Car moves and operations continually add to the vehicle.                            | 2 x 1         | 2              | 6          |
| 2 | Discussion could involve:   |               |                |            |
|   | - style   |               |                |            |
|   | - trends  |               |                |            |
|   | - disposable society  |               |                |            |
|   | - teenage driven  |               |                |            |
|   | - Quick manufacture time  |               |                |            |
|   | - Speed/quantity v quality etc  |               |                |            |
|   | Critical examination of issues  | up to 2 marks |                |            |
|   | Quality of explanation  | up to 3 marks |                |            |
|   | Supporting examples/evidence  | 1 mark        |                |            |
|   | Sketches  | 2 marks       |                |            |
|   |   | 8             | 8              | 8          |
| 3 | a) Could be timber (hardwood/softwood – specific needed)<br>Could be plastic (hdpe for example)   | 2 x 1         | 2              |            |
|   | b) Suitable description of properties for each. Expect two properties for each.   | 2 x 2         | 4              |            |
|   | c) Answer could be outline of drilling process OR outline of vacuum forming process.  |               |                |            |
|   | Process (at least FOUR stages) – 2 marks  |               |                |            |
|   | Tools & equipment – 1 mark  |               |                |            |
|   | Safety features – 1 mark  |               |                |            |
|   |   | 4             | 4              | 10         |

| Page 2 | Mark Scheme                       | Syllabus | Paper |
|--------|-----------------------------------|----------|-------|
|        | AS Level Examinations – June 2002 | 9705     | 1     |

|   |  |       |   |                |
|---|--|-------|---|----------------|
| 4 | a) Suitable finish stated – cuprinol etc.  | 1     | 1 |                |
|   | b) <del>Explanation</del> should include <i>Description</i>  |       |   |                |
|   | • Preparation of surface   |       |   |                |
|   | • Application of finish  |       |   |                |
|   | • Cleaning of equipment  |       |   |                |
|   | • Health & safety issues.  | 4 x 1 | 4 | 5              |
| 5 | a) Loads otherwise impossible to move, can be raised with the help of a lever. The mechanical advantage of the lever is given by load/effort. However distance moved by effort is often greater than distance moved by load. | 2     | 2 |                |
|   | b) Suitable example drawn.<br>Correct labels for effort and fulcrum.   | 2     | 2 | 4              |
| 6 | a) Steel – strong, easy to join, relatively cheap etc.   | 2 x 1 |   |                |
|   | Aluminium – lightweight, requires no finish application etc.   | 2 x 1 | 4 |                |
|   | b) Suitable solution presented.<br>Feasibility.<br>Construction.<br>Sketch or explanatory notes.   | 3 x 1 | 3 | <del>4</del> 7 |

SECTION A TOTAL 40

|               |  |                 |              |
|---------------|--|-----------------|--------------|
| <b>Page 3</b> | <b>Mark Scheme</b>                       | <b>Syllabus</b> | <b>Paper</b> |
|               | <b>AS Level Examinations – June 2002</b> | <b>9705</b>     | <b>1</b>     |

### **Section B**

|           |   |                          |                       |
|-----------|---|--------------------------|-----------------------|
| <b>7a</b> | Suitable timber named.<br>Two suitable reasons for selection  | <b>1</b><br><b>2</b>     | <b>3</b>              |
| <b>7b</b> | Excellent sketching techniques shown. All details of the preparation described. All stages covered and in order. Tools and machines identified.<br><br>Sketching of a good standard. Suitable details of the preparation of materials given. Most stages identified and in reasonable order. Majority of tools and machines named.        | <b>7-8</b><br><b>3-6</b> |                       |
|           | Basic sketching techniques used. Limited details of preparation. Only a few stages considered with limited knowledge of tools and equipment.  | <b>0-2</b>               | <b>8</b>              |
| <b>7c</b> | Excellent sketching techniques shown. All details of the support method described. All stages covered and in order. Tools and machines identified.<br><br>Sketching of a good standard. Suitable details of the support method and materials given. Most stages identified and in reasonable order. Majority of tools and machines named. | <b>6-7</b><br><b>3-5</b> |                       |
|           | Basic sketching techniques used. Limited details of support method. Only a few stages considered with limited knowledge of tools and equipment.   | <b>0-2</b>               | <b>7</b>              |
| <b>7d</b> | Suitable finish specified.<br>Adequate reasoning given.   | <b>1</b><br><b>1</b>     | <b>2</b><br><b>20</b> |

| Page 4 | Mark Scheme                       | Syllabus | Paper |
|--------|-----------------------------------|----------|-------|
|        | AS Level Examinations – June 2002 | 9705     | 1     |

|           |   |               |   |    |
|-----------|---|---------------|---|----|
| <b>8a</b> | Four relevant points – e.g. safety, interest, size, colour etc.   | 4 x 1         | 4 |    |
| <b>8b</b> | Excellent sketching techniques shown. Two different ideas shown. All details of the construction described. Correct materials, tools and machines identified.               | 6-8           |   |    |
|           | Sketching of a good standard. Two different ideas shown Suitable details of the construction given. Majority of materials, tools and machines named.                        | 3-5           |   |    |
|           | Basic sketching techniques used. Two similar or even one idea only. Limited details of construction. Only a few details of materials, tools or equipment shown.             | 0-2           | 8 |    |
| <b>8c</b> | All stages considered in detail and presented in correct order.   | 6-8           |   |    |
|           | Most aspects considered in some detail and ordered.   | 3-5           |   |    |
|           | Basic outline described.  | 0-2           | 8 | 20 |
| <b>9a</b> | Suitable materials– e.g. Pine, mahogany etc.<br>Two suitable reasons to justify choice related to selected material.  | 1<br>2 x 1    | 3 |    |
| <b>9b</b> | Excellent sketching techniques shown. All details of the preparation described. All stages covered and in order. Tools and machines identified.                             | 7-8           |   |    |
|           | Sketching of a good standard. Suitable details of the preparation of materials given. Most stages identified and in reasonable order. Majority of tools and machines named. | 3-6           |   |    |
|           | Basic sketching techniques used. Limited details of preparation. Only a few stages considered with limited knowledge of tools and equipment.                                | 0-2           | 8 |    |
| <b>9c</b> | Suitable jigs or fixtures described to batch produce 30 boxes.<br>Jig/fixture   |               |   |    |
|           | - feasibility   | up to 2 marks |   |    |
|           | - construction  | 1 mark        |   |    |
|           | - sketches/explanatory notes  | up to 2 marks | 5 | 5  |
| <b>9d</b> | Suitable former shown.  |               |   |    |
|           | - two rectangular sections on correct centre line.  | 1             |   |    |
|           | - Draft angles/ vent holes.   | 1             |   |    |
|           | - Radii on corners  | 1             |   |    |
|           | - Overall sizes.  | 1             | 4 | 20 |

|               |  |                 |              |
|---------------|--|-----------------|--------------|
| <b>Page 5</b> | <b>Mark Scheme</b>                       | <b>Syllabus</b> | <b>Paper</b> |
|               | <b>AS Level Examinations – June 2002</b> | <b>9705</b>     | <b>1</b>     |

### Section C

|            |  |              |          |           |
|------------|--|--------------|----------|-----------|
| <b>10a</b> | Three suitable properties – tough, stainless, retains sharp edge, non-toxic etc.   | <b>3 x 1</b> | <b>3</b> |           |
| <b>10b</b> | Suitable thermoplastic named e.g. polypropylene, polystyrene etc. <b>and two</b> suitable reasons for choice – could be colour, easily formed, wear quality, weight etc.                   | <b>1</b>     |          |           |
|            |  | <b>2 x 1</b> | <b>3</b> |           |
| <b>10c</b> | Suitable improvement for safety ( blade guard or non slip handle for example)<br>Suitable improvement for comfort (textured or moulded hand grip for example)                              |              |          |           |
|            | Large range of possibilities considered and presented in depth. All comment is relevant to specific safety/comfort problem and not generalisations.  | <b>5-6</b>   |          |           |
|            | Reasonable range of possibilities considered but not presented in as much depth. Most comment directed to specific safety/comfort problem although some may be generalisations.            | <b>2-4</b>   |          |           |
|            | Limited range of possibilities shown, one expanded on. Usually based on generalisations.   | <b>0-1</b>   | <b>6</b> |           |
| <b>10d</b> | Excellent sketching techniques shown. All details of the joining method shown in both parts of the body. Solution would be accepted method in industry.                                    | <b>7-8</b>   |          |           |
|            | Sketching of a good standard. Suitable details of the joining method shown in both parts of the body. Solution would work but may not be accepted method, or may have slight deficiencies. | <b>3-6</b>   |          |           |
|            | Basic sketching techniques used. Limited details of the joining method shown – possibly only in one half. Solution probably would have severe problems.                                    | <b>0-2</b>   | <b>8</b> | <b>20</b> |

| Page 6 | Mark Scheme                       | Syllabus | Paper |
|--------|-----------------------------------|----------|-------|
|        | AS Level Examinations – June 2002 | 9705     | 1     |

|            |  |  |          |           |
|------------|--|--|----------|-----------|
| <b>11a</b> | Excellent sketching techniques shown. All details of the preparation described. All stages covered and in order. Tools and equipment identified.   | <b>6-7</b>                                   |          |           |
|            | Sketching of a good standard. Suitable details of the preparation of materials given. Most stages identified and in reasonable order. Majority of tools and equipment named.   | <b>3-5</b>                                   |          |           |
|            | Basic sketching techniques used. Limited details of preparation. Only a few stages considered with limited knowledge of tools and equipment.   | <b>0-2</b>                                   | <b>7</b> |           |
|            | Possibilities:<br>Brazing. – Clean joint, mix flux, apply flux, wire joint, heat joint, touch solder onto joint, remove heat and allow to cool.<br><br>Welding – clean joint area, heat using very hot flame, both surfaces together, apply filler rod into gap, molten metal used to fill/join surfaces |  |          |           |
| <b>11b</b> | Excellent sketching techniques shown. All details of the preparation described. All stages covered and in order. Tools and equipment identified.   | <b>6-7</b>                                   |          |           |
|            | Sketching of a good standard. Suitable details of the preparation of materials given. Most stages identified and in reasonable order. Majority of tools and equipment named.   | <b>3-5</b>                                   |          |           |
|            | Basic sketching techniques used. Limited details of preparation. Only a few stages considered with limited knowledge of tools and equipment.   | <b>0-2</b>                                   | <b>7</b> |           |
|            | Soft soldering – clean joint, flux the joint, tin the surfaces, reflux tinned surfaces, press together, apply heat and allow to cool.<br>Hard soldering – wire the joint before proceeding ?   |  |          |           |
| <b>11c</b> | For each joint ONE suitable comment relating to the three key aspects:<br>Strength;<br>Ease of use;<br>Quality of finish   | <b>2 x 1</b><br><b>2 x 1</b><br><b>2 x 1</b> | <b>6</b> | <b>20</b> |



| Page 7 | Mark Scheme                       | Syllabus | Paper |
|--------|-----------------------------------|----------|-------|
|        | AS Level Examinations – June 2002 | 9705     | 1     |

**12a** Four types of manufactured board named and sketched.  
Blockboard, laminboard, chipboard, plywood, MDF, hardboard. **4 x 1 4**

**12b** Three suitable advantages – could be flat boards in large sizes,  
relative cost, less waste, recycled material etc. **3 x 1**  
Three suitable limitations – lacks character, limited to thicknesses,  
grain structure, needs end treatment etc. **3 x 1 6**

**12c** Discussion could involve *one of*:  
- Use of loose joints  
- Use of straps,  
- Use of softwood core with hardwood veneer etc

Critical examination of issues up to 2 marks  
Sketches 2 marks **4**

**12d** Discussion could involve:  
- use of large flat manufactured boards  
- edging in solid wood  
- stability  
- decoration  
- strength etc  
Critical examination of issues up to 2 marks  
Quality of explanation up to 2 marks  
Supporting examples/evidence 1 mark  
Sketches 1 marks **6 20**