



**2007 Product Design**

**Advanced Higher**

**Finalised Marking Instructions**

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## 2007 Product Design

### Advanced Higher

### Marking Scheme

#### Question 1

- (a) **1 mark for each relevant benefit up to a maximum of 2.**

Benefits may include:

- Suitable for detail of component
- High level of accuracy
- Suitable for mass production
- Suitable for material
- Cost effective for mass production.

- (b) **1 mark for each appropriate process (up to a maximum of 2) and 1 mark for appropriate benefit of each (4 marks total), eg**

**Processes:** Die Casting, Pressure Die Casting, Drop Forging, Investment Casting, Sand Casting.

**Benefits:** to match processes and may include: complexity, level of detail, suitability for mass production or low production runs, economy of scale, suitability for materials.

- (c) **1 mark for manufacturing difficulty, 1 mark for resolution and 1 mark for sketch (3 marks total), eg**

**Part A:** Difficulties could include complexity of shape, lining up of holes, curves, level of accuracy.

**Part B:** Strength, accuracy, complex components, hollowing.

**Resolution and sketch** to match difficulty identified.

- (d) **1 mark for assembly difficulty, 1 mark for resolution and 1 mark for sketch (3 marks total), eg**

**Assembly Difficulty:** Number of parts, moving parts, order of assembly important, loose fit required, lining up of parts, holding awkward shapes.

**Resolution and sketch** to match difficulty identified

**(e) 1 mark for each valid method up to a maximum of 2 marks.**

Points may include:

- Quality control
- Total Quality Management
- Product Testing
- Quality of raw materials
- Quality checks
- Train and monitor staff
- Highly skilled labour force
- Random sampling

**(Total 14 marks)**

## Question 2

- (a) **1 mark for each reason outlined up to a maximum of 2 marks**

Points may include:

- Better products come to market
- Market saturation
- New technology
- Changes in legislation
- Bad publicity/product fails to live up to expectations
- Cheap copies/cloning

- (b) **1 mark for description of each relevant type of information, maximum of 3 marks per type of research (4 marks total), eg**

**Field:** Opinions of people on a variety of issues, eg, aesthetics and ergonomics

**Desk:** Details of other products such as costs, reviews of other products. New materials and processes. Developments in technology.

- (c) **2 marks for each justified point up to a maximum of 6 marks.**

Points may include:

- Promotions
- Update graphics
- Celebrity endorsements
- Change packaging
- Minimal component changes
- Added value accessories, eg carrying cases
- Point of sale displays
- Change distribution channels, widen market.

**(Total 12 marks)**

### Question 3

- (a) **1 mark for appropriate market for each kettle up to 2, 1 mark for each appropriate justification up to 2 (4 marks total).**

Note that justification must match target market.

- (b) **Up to 2 marks per reason (4 marks total).**

Reasons may include:

- Type of production
- Scale of production
- Quality
- Finish
- Branding
- Materials

Note that the impact of any of the above has to be described to gain the full marks.

- (c) (i) **1 mark for each point, maximum of 3 marks per kettle (4 marks total).**

Note that answers are based on photographs and are the opinion of the candidate. Marks are awarded for valid or justified points.

- (ii) **1 mark per valid point (4 marks maximum).**

Points may include:

- Focus on function then resolve aesthetics or vice versa.
- Tight specification
- Make models/market test
- Use checklist

Note candidate may give brief details of a number of methods or detail of one method.

**(Total 16 marks)**

#### **Question 4**

**1 mark for each use of computer technology, up to 6 and 1 mark for each benefit up to 6 (maximum of 12 marks). Note that a maximum of 1 mark can be awarded for benefits of each use, ie to gain 12 marks candidates require to identify at least 6 uses and give benefits of each.**

**Uses may include:**

- Modelling
- Video conferencing
- Transfer of information
- Quality checking
- Production lines
- CNC
- CAD
- Online marketing
- Online research

**Benefits to match uses.**

**(Total 12 marks)**

### Question 5

- (a) **1 mark per description (up to 3 marks), 1 mark per outline of consequences (up to 3 marks). Total 6 marks.**

**Tasks** may include:

- Clarification of tasks/setup design team
- Setting of deadlines/timescales/Gantt charts
- Allocation of budgets
- Clarification of brief/specification

**Consequences** to match tasks.

Note that “research” is not a key task for planning and organisation.

- (b) (i) **1 mark per valid point (up to a maximum of 6 marks).**

Note that Candidates are required to use a range of products to illustrate differences in importance of stages. Marks are not awarded for comparing products.

- (ii) **1 mark per problem identified up to maximum of 3 marks (one problem per stage), 2 marks per description of resolution up to maximum of 4 marks (7 marks total).**

Problems may include:

- Inappropriate data
- Lack of funding/inappropriate budgets
- Ideas unworkable/inappropriate market
- Lack of technology
- Infringement of copyright
- No demand

**Resolutions** to match problems.

**(Total 19 marks)**

### Question 6

- (a) **1 mark per risk (up to 3), 2 marks per explanation of how they may be overcome (up to 6). Total 9 marks.**

**Risks** may include:

- Product failure
- IPR infringement
- Saturated market
- Pricing
- Limited awareness/poor advertising/point of sale materials
- Product differentiation
- Forecast of demands

**Explanations** to match risks and may include areas such as:

- Advertising
- Marketing
- Research
- User trials
- Patents Office
- Endorsements
- BSI/Kitemarks
- Market Research
- Models/Prototypes
- Batch Production/JIT
- Special Features

- (b) **1 mark for description of each benefit (up to 6), maximum of 4 marks per team (6 marks total), eg**

**In-house:**

- Good funding
- Better communication
- Clearer understanding
- Salary/fixed cost/bonus incentives

**Consultants:**

- Specialist skills
- Fresh ideas/outside the box
- Professional endorsement/known designer
- Additional specialist resources

**(Total 15 marks)**

### Question 7

This question is set to test the candidate’s ability to present a reasoned argument to a design issue. Although there is an underlying body of design knowledge required to answer it there is a very wide range of possible answers. Therefore the question is marked holistically. The features which are looked for are knowledge of the subject matter, ability to comprehend the question and to construct an answer which uses clear examples to support the stance taken.

The table below is used to place answers within the full mark range.

0-3	4-6	7-9	10-12
<p>An answer which falls into this category may do so for a number of reasons. It could be that:</p> <ul style="list-style-type: none"> <li>• It demonstrates very little knowledge or understanding of the subject matter</li> <li>• There is little or no reference to products</li> <li>• No stance is taken</li> <li>• Much of it does not answer the question</li> <li>• The answer is simply too thin</li> </ul>	<ul style="list-style-type: none"> <li>• Knowledge of the subject matter and a secure understanding of the main aspects will be demonstrated</li> <li>• The answer will be relevant to the question</li> <li>• Reference to at least one product</li> <li>• Although examples are used stance taken is unclear</li> </ul>	<ul style="list-style-type: none"> <li>• Knowledge of the subject matter and a secure understanding of the main aspects will be demonstrated</li> <li>• The answer will be relevant to the question and demonstrate a good level of comprehension</li> <li>• Reference to a few products or selected references to a number of products</li> <li>• A clear stance is taken and examples are used to support it</li> </ul>	<ul style="list-style-type: none"> <li>• Detailed knowledge of the subject matter and a secure understanding of the all aspects will be demonstrated</li> <li>• The answer will be relevant to the question demonstrating a high level of comprehension</li> <li>• Very detailed reference to a few products or selected references to a wide range of products</li> <li>• Examples are clearly used to illustrate and support stance taken</li> </ul>

**(Total 12 marks)**

**Question 7 (contd)**

**(a)** Points may include:

- Ability of some products to be reused/recycled
- Thermoplastics v thermosetting plastics
- Disposal society/low value products
- Repair and maintenance of products
- Designer responsibility
- Packaging
- Threat to wildlife
- Recycle logos/efficiency information
- Alternative materials
- Reduction of materials/weight
- Lower washing temperatures
- Transportation
- Trade ins
- High tech v Energy use
- Government policies

**(b)** Points may include:

- Fashion trends and styling
- Communication methods, eg mobile phones
- Miniaturisation/product evolution
- Redesign because of competition/new materials/market share
- Cultural shifts
- Commerce
- Changes in expectations of age groups
- Gender bias

[END OF MARKING INSTRUCTIONS]