Cambridge International AS & A Level

Cambridge International Examinations
Cambridge International Advanced Subsidiary and Advanced Level

DESIGN AND TECHNOLOGY **9705/13**

Paper 1 **October/November 2016**

MARK SCHEME

Maximum Mark: 120

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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Section A

1 **(a)** Each correct property 1 mark (0–2) **[2]**
e.g. Mallable, ductile, corrosion resistant, good conductor of heat and electricity, polishes well (good finish)

(b) **(i)** Appropriate marking out process described (0–2)
Appropriate cutting and smoothing processes described (0–2)
Details of appropriate tools, equipment and safety precautions (0–2) **[6]**

(ii) Appropriate annealing process described (0–2)
Appropriate forming process described (0–2)
Details of appropriate tools, equipment and safety precautions (0–2) **[6]**

(iii) Appropriate soldering process described (0–3)
Details of appropriate tools, equipment and safety precautions (0–3) **[6]**

[Total: 20]

2 **(a)** **(i)** Correct answer orthographic drawing (or projection) **[1]**

(ii) Correct answer third angle (orthographic projection) **[1]**

Both marks can be awarded is both answers are correctly given in a single statement

(b) Pictorial drawing produced (0–2)
Viewed in correct direction (1)
Three parts of house well drawn (0–3) **[6]**

(c) **(i)** Correct shape marked out (0–2)
Cutting out and assembly described (0–2)
Details of appropriate tools, equipment and safety precautions (0–2) **[6]**

(ii) Correct shape marked out (0–2)
Cutting out and assembly described (0–2)
Details of appropriate tools, equipment and safety precautions (0–2) **[6]**

[Total: 20]

3 **(a)** Answer shows layers of veneer (wood) 1 mark alternate layers are at right angles (0–2) **[2]**

(b) **(i)** Appropriate marking out process described (0–2)
Appropriate cutting and smoothing processes described (0–2)
Details of appropriate tools, equipment and safety precautions (0–2) **[6]**

(ii) Joining process described (0–3
Details of appropriate tools, equipment and safety precautions (0–3) **[6]**

(iii) Appropriate making process described (0–3)
Details of appropriate tools, equipment and safety precautions (0–3) **[6]**

[Total: 20]

Section B

4 **(a)** Allows the product being manufactured to be easily removed. (0–2) **[2]**

(b) Problem one identified and described (0–2)
Problem two identified and described (0–2) **[4]**
e.g. Current design has no way of getting plastic into the mould
Method of locating two parts of mould together is not complete, there are holes for locating pins but no pins

(c) Explanation of how problem one could be overcome (0–3)
Explanation of how problem two could be overcome (0–3) **[6]**
e.g. Appropriate tapered hole or sprue has been added
Two appropriate locating pins have been added

(d) Situation has been analysed and relevant issues/points identified (0–3)
Clear and appropriate explanations of why issues/points are considered relevant (0–3)
Specific examples/evidence used to support conclusions (0–2) **[8]**

[Total: 20]

5 **(a)** The plastic ring fits over the top of the box and holds the box together, no glue is required (0–2) **[2]**

(b) Problem one identified and described (0–2)
Problem two identified and described (0–2) **[4]**
e.g. The fold in flaps are the wrong shape and will prevent the box folding to the required shape
The surface decoration is wrong and will not produce the joined up design shown in the drawing of the assembled packaging

(c) Explanation of how problem one could be overcome (0–3)
Explanation of how problem two could be overcome (0–3) **[6]**
e.g. Shape of fold in flaps is changed, the pointed end of each flap needs to finish at the apex of each triangular side
The design of the surface decoration is changed so that it produces the required joined up shape when the packaging is assembled

(d) Situation has been analysed and relevant issues/points identified (0–3)
Clear and appropriate explanations of why issues/points are considered relevant (0–3)
Specific examples/evidence used to support conclusions (0–2) **[8]**

[Total: 20]

6 **(a)** Correct answers rotary motion 1 mark reciprocating motion 1 mark (0–2) **[2]**

(b) **(i)** Problem related to the quality of the toy's manufacture is identified and described (0–2) **[2]**
e.g. The mechanical toy will not work, when the handle is turned the person will not move because there is a problem with the design of the circular disc

(ii) Problem related to the quality of the toy's manufacture is identified and described (0–2) **[2]**
e.g. There are splits in the wood, pieces of wood on the left hand end do not line up and one end of the top is poorly finished

(c) Explanation of how problem one could be overcome (0–3)
Explanation of how problem two could be overcome (0–3) **[6]**
e.g. The hole in the circular disc needs to be offset or the shape changed to a pear shape cam
More quality control checks need to be introduced and more care taken during the manufacture of the toy

(d) Situation has been analysed and relevant issues/points identified (0–3)
Clear and appropriate explanations of why issues/points are considered relevant (0–3)
Specific examples/evidence used to support conclusions (0–2) **[8]**

[Total: 20]

Section C

7 (a) One pre-conceived Idea presented (0–4)
OR
The development and selection of a range of ideas Into a single design proposal which would appear to work but lacks some technical detail (5–8)
OR
The development and selection of a range of Ideas into a single design proposal that Includes sufficient technical detail to show that the proposed solution would clearly work (9–12)
Clarity and quality of sketching and explanatory notes (0–4)
Evaluation (reasons for selection) (0–4) **[20]**

(b) As for **part (a)** **[20]**

(c) As for **part (a)** **[20]**

(d) The drawing will exhibit a reasonable standard of outcome and show some of the required design features (0–5)
OR
The drawing will exhibit a good standard of outcome and show most of the design features required to make the product function as intended (6–9)
OR
The drawing will be completed to a high standard of outcome and fully show the design features required to make the product function as intended (10–14)

Some use made of colour and tone to enhance the visual Impact of the drawing (0–2)
OR
Good use has been made of colour and tone to enhance the visual impact of the drawing (3–4)
OR
Very good use has been made of colour, tone and material representation to enhance the visual impact of the drawing (5–6) **[20]**

[Total: 80]

Questions 8 and 9 as for Question 7