Cambridge International AS & A Level

Cambridge Assessment International Education
Cambridge International Advanced Subsidiary and Advanced Level

DESIGN AND TECHNOLOGY **9705/12**

Paper 1 **October/November 2019**

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.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the October/November 2019 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5: Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).
GENERIC MARKING PRINCIPLE 6: Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Section A

Question	Answer	Marks	Guidance
1(a)	TIG Weld, Pop rivet, riveting, welding, nut and bolts, epoxy resin, self-tapping screws	**2**	Accept other correct procedures, Not soft soldering
1(b)(i)	Appropriate bending process described (0–3) Details of appropriate tools, equipment and safety precautions (0–3)	**6**	Marking out, use of a square, measurement, method of folding (block, folding bars, vice, corner of a bench, folding machine etc.) Limited tools/equipment 1 mark Good tools/equipment 2 marks Good tools/equipment & safety precautions 3 marks
1(b)(ii)	Appropriate method for making part B described (0–3) Details of appropriate tools, equipment and safety precautions (0–3)	**6**	How to cut out; saw, snips, guillotine, file, emery vice to hold, clamp, curve formed Limited tools/equipment 1 mark Good tools/equipment 2 marks Good tools/equipment & safety precautions 3 marks
1(c)	Appropriate changes that could be made to the design to improve the comfort of the product described (0–3) How changes could be made clearly communicated (0–3)	**6**	Handle, curves for palm, added thickness, bending the handle Limited detail; poor line quality 1 mark Good detail; line quality 2 marks Accurate detail; line quality 3 marks

Question	Answer	Marks	Guidance
2(a)(i)	Pritt, PVA, Glue Gun, Double sided tape	**1**	Accept other correct glue/trade name
2(a)(ii)	Corriflute, Foamboard, Polystyrene, Aluminium	**1**	Accept other correct material
2(b)	Pictorial view produced (0–3) Quality of sketch (0–3)	**6**	Three dimensional view shown 1 mark Windows and Doors shown 1 mark Proportion of house and detailing 1 mark Limited detail 1 mark Good detail 2 marks Fully detailed 3 marks
2(c)(i)	Correct shape marked/cut out and attachment to house described (0–3) Details of appropriate tools, equipment and safety precautions (0–3)	**6**	Measure, marking out, rule, knife, guillotine, knife, attach, glue tabs. Limited tools/equipment 1 mark Good tools/equipment 2 marks Good tools/equipment & safety precautions 3 marks
2(c)(ii)	Correct shape marked/cut out and assembly described (0–3) Details of appropriate tools, equipment and safety precautions (0–3)	**6**	Measure, marking out, rule, knife, guillotine, attach, glue tabs, glue, windows and doors, assembly. Limited tools/equipment 1 mark Good tools/equipment 2marks Good tools/equipment & safety precautions 3 marks

Question	Answer	Marks	Guidance
3(a)	Stable material, no warping, grain structure, more hardwearing, durable	**2**	Accept other correct reasons
3(b)(i)	Appropriate method of making part A and attaching to part A (0–3) Details of appropriate tools, equipment and safety precautions (0–3)	**6**	Hand techniques or CAM both acceptable Mark out, cut out, band saw, hand saw, file, sand, cut outs Limited tools/equipment 1 mark Good tools/equipment 2 marks Good tools/equipment & safety precautions 3 marks
3(b)(ii)	Appropriate method of making part B described (0–3) Details of appropriate tools, equipment and safety precautions (0–3)	**6**	Hand techniques or CAM both acceptable Mark out, cut out, band saw, hand saw, file, sand Semi-permanent e.g. marking out pilot holes and using wood screws, Key slots. Limited tools/equipment 1 mark Good tools/equipment 2 marks Good tools/equipment & safety precautions 3 marks
3(c)	Appropriate changes suggested (0–3) How changes could be made clearly communicated (0–3)	**6**	Grip, shape, rounded edges, easy to read, comfortable to hold, easier to use. Limited detail; poor line quality 1 mark Good detail; line quality 2 marks Accurate detail; line quality 3 marks

Section B

Question	Answer	Marks	Guidance
4(a)	Function of part X explained	**2**	Post top/cap named Seals end grain stopping penetration by rain (if wooden) Improves aesthetics Prevents the name section/sign from being removed from the post thus improving security
4(b)	Two problems identified and described	**4**	Sign cannot adjust/turn to alter directions for users Sign cannot be easily changed to offer flexibility for different events Ticket sign could slide out Sharp edges could be dangerous to people walking past No height adjustment or pins to hold the sign at a set height or indeed allow changes to height
4(c)	Explanation of how problem one could be overcome (0–3) Explanation of how problem two could be overcome (0–3)	**6**	Changing central pole to cylindrical tube allows for movement of signs in any direction Holes added in central post to allow adjustment and locking pins for placement Changing metal edge around sign to allow signs to be easily removed and replaced Remove sharp edges Accept other correct change

Question	Answer	Marks	Guidance
4(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**	Surface finishes improve aesthetics allowing different textures, finishes and colours to suit the environment it is being used in. It can also be branded with a corporate colour scheme. Different colours can aid visibility so users can see sign more easily from a distance. Surface finishes aid weather resistance thus reducing chances of rot, rust, discolouring. Improves durability and lifespan Accept other correct issue

Question	Answer	Marks	Guidance
5(a)	Function of part X explained	**2**	Base to aid removal of mould from formed plastic shape To allow card to sit in for marketing when blister pack is assembled with product Create a lip Allow further rigidity to the packaging. Place to put air holes in to aid more accurate mould
5(b)	Problem one identified and described (0–2) Problem two identified and described (0–2)	**4**	There are no draft angles present so mould will not release smoothly when thermoplastic cools, thus plastic can be cracked or split on removal so wasting materials. The corners are all sharp therefore stretching plastic and making for a weak point. No air holes to create suction.

Question	Answer	Marks	Guidance
5(c)	Explanation of how problem one could be overcome (0–3) Explanation of how problem two could be overcome (0–3)	**6**	Draft angles added on all four vertical surfaces (5 degrees) Radius added to all horizontal and vertical edges – as well as right angled corners to allow more gradual stretching of plastic, avoiding splitting Air holes added in lip or in main body of mould to increase accuracy via extra suction. Accept other correct change
5(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**	Repeatability of the same shape of package for batch or mass produced products allows quick and cost effective packaging to be used readily Quality Control or vacuum forming is relatively straightforward and makes it a popular choice with packaging companies Allows user to see the product clearly with transparent blister packaging Vacuum forming protects the products from damage Some thermoplastic packaging can be recycled Lightweight for easy transportation Accept other correct issue

Question	Answer	Marks	Guidance
6(a)	Function of part X explained	**2**	Rawlplug – aids secure fitment of screws to solid walls
6(b)	Problem one identified and described (0–2) Problem two identified and described (0–2)	**4**	Metal bracket cannot bend so the TV bracket is fixed in one position only No mechanism for screen to tilt on bracket so any light in the room or positioning so that user can view more easily is not enabled Distance from the wall adds pressure on the bracket (1 mark only)
6(c)	Explanation of how problem one could be overcome (0–3) Explanation of how problem two could be overcome (0–3)	**6**	Bracket should be able to bend or connections at each end should allow movement so that TV can be viewed from different directions Tilt mechanism to add to screen end of bracket thus allowing flexibility for viewing Reduce length or change point or direction of pressure on bracket Accept other correct change

Question	Answer	Marks	Guidance
6(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**	Standardised components are more cost effective as they are made by companies who specialise in their manufacture – which improves accuracy, confidence and also reduces costs It is generally easier to replace standardised component if they break which extends lifespan of product as well as reputation of company. Increases brand confidence. Standardised parts are easier to design into a product and can bring overall costs of a product down. Ease of replacing parts within furniture is better for environment as furniture repaired rather than thrown away Accept other correct issue

Section C

Question	Answer	Marks	Guidance
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 which would appear to 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**	
7(b)	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 which would appear to 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**	

Question	Answer	Marks	Guidance
7(c)	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 which would appear to 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**	
7(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**	

Question	Answer	Marks	Guidance
8(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 which would appear to 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**	
8(b)	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 which would appear to 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**	
8(c)	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 which would appear to 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**	

Question	Answer	Marks	Guidance
8(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**	

Question	Answer	Marks	Guidance
9(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 which would appear to 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**	
9(b)	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 which would appear to 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**	
9(c)	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 which would appear to 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**	

Question	Answer	Marks	Guidance
9(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**	