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General Certificate of Secondary Education

June 2012

Design and Technology: 45751

Short Course

(Specification 4575)

Unit 1: Written Paper

Final

Mark Scheme

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all examiners participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for standardisation each examiner analyses a number of students' scripts: alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, examiners encounter unusual answers which have not been raised they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

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<table>
<tr><th>Question</th><th>Part</th><th>Sub Part</th><th>Marking Guidance</th><th>Mark</th><th>Comment</th></tr>
<tr><td>1</td><td>(a)</td><td></td><td>
<table>
<tr><td>Margarine</td><td>Block</td></tr>
<tr><td>Birch</td><td>Dowel</td></tr>
<tr><td>Pewter</td><td>Ingot</td></tr>
<tr><td>Embroidery silk</td><td>Skein</td></tr>
<tr><td>Plywood</td><td>Sheet</td></tr>
</table>
</td><td>4</td><td>1 mark for each correct answer

If two lines are drawn from 1 ‘Material’ to two different ‘stock forms’ award 0 marks.

If more than one material is connected to a single stock form only award a mark for the one which is correct.

If more than four ‘Materials’ have been chosen, mark up to the first four ‘Materials’

Max 4 marks</td></tr>
<tr><td>1</td><td>(b)</td><td>(i)</td><td>Appropriate product which utilises one of the components listed. For example:

<table>
<tr><th>Standard component</th><th>Product</th></tr>
<tr><td>Zip</td><td>Product that requires a fastening e.g. trousers, skirt, jumper, pencil case etc</td></tr>
<tr><td>Hinge</td><td>Door, kitchen cupboard, toy box, piano</td></tr>
<tr><td>Puff pastry sheet</td><td>Any suitable product which includes pastry e.g. pasty, vanilla slice, quiche, mince pie, jam tart etc</td></tr>
</table>

Do not accept generic terms such as clothes, furniture, food</td><td>1</td><td>Any other relevant responses should be credited.</td></tr>
</table>

<table>
<tr>
<td>1</td>
<td>(b)</td>
<td>(ii)</td>
<td>Appropriate component which is suitable for the product named in part b (i) e.g:

<table>
<tr><td>Material</td><td>Examples of standard components</td></tr>
<tr><td>Textiles</td><td>button, hook & eye, velcro, press stud</td></tr>
<tr><td>RMT</td><td>Screw, nail, bolt, catch, locks, handles, pull</td></tr>
<tr><td>Food</td><td>Ready prepared ingredients e.g. tinned pie filling, frozen ready prepared vegetables</td></tr>
<tr><td>Systems</td><td>Transistor, resistors</td></tr>
</table>
</td>
<td>1</td>
<td>Any other relevant response should be credited</td>
</tr>
</table>

1	(c)		Responses might include: **Advantages:** • Readily available • Less effort • Less equipment required • Reduced range of skills required • Allows you to work to designated tolerances • Can be bought in bulk – reduces cost • Production costs less • Makes repair easy as replacement parts are readily available • Speeds up manufacture • Helps with QA/QC – consistency of outcome **Disadvantages:** • Lack of quality control • Quality issues – need for QC • Special storage conditions might be needed for food components • Might be more expensive • Supply issues might slow manufacture • Food components might have poor sensory or nutritional qualities • Need to be made to specific tolerance • Reduces creativity • Less individuality as components all similar <u>Do NOT accept</u> • Easy to use, this is not the same as simplifies/speeds up manufacture Award cheap if explained e.g. because mass produced item (lower production cost)	6	1 mark for each simplistic point made. 2 marks for each point made with some explanation Max 6 marks

<table>
<tr><th>Question</th><th>Part</th><th>Sub Part</th><th>Marking Guidance</th><th>Mark</th><th>Comment</th></tr>
<tr><td>2</td><td>(a)</td><td></td><td>For example:
<table>
<tr><th>Characteristic</th><th>Specification point</th><th>Explain why it is important to the target market</th></tr>
<tr><td>• Hat
• Trinket box
• Pizza</td><td>Specific info about colours, textures, flavours, shapes, imagery

e.g. a hat for children should be brightly coloured and should use themes popular with children e.g. animals</td><td>Reasoning likely to be linked to age ranges/ genders preferring particular colours</td></tr>
<tr><td>Function - Hat</td><td>e.g. to keep the head warm</td><td>It will be warn in wintery conditions</td></tr>
<tr><td>Function – Trinket box</td><td>e.g. to look attractive in the room, large enough to hold..., have compartments for..., lockable,</td><td>Needs to coordinate with other things in the room and not look out of place, to make sure that treasured possessions are safe and secure,</td></tr>
<tr><td>Function - Pizza</td><td>e.g. filling, provide a variety of nutrients</td><td>Vegetarians need sources of nutrients commonly found in meat e.g. protein</td></tr>
</table></td><td>4</td><td>Specification point which expands on heading aesthetics or function:
2 x1 mark

Explanation:
2 x1 mark

Repeat of headings with no expansion or repeat of product description.
Award no marks.</td></tr>
</table>

2	(b)		Examples provided to exemplify different mark ranges. Award one mark for each type of change – e.g. shape, colour etc and one mark for each <u>different</u> justification Feasible and effective idea, well drawn and clearly annotated with a variety of information which is more than descriptive e.g. explains / justifies / evaluates (6 marks) Clear changes to the idea – e.g. change of function, additional features. Some of the labelling is more than descriptive e.g. explains / justifies / evaluates (4 – 5 marks) Small changes to the idea – mainly superficial e.g. surface shape/decoration, labelling is superficial e.g. it is blue, this is a hinge etc (2 – 3 marks) Idea redrawn but some simple labelling evident or idea redrawn with one small change, no labelling (1 mark) Redrawn idea from the question with no changes, no labelling – **award no marks**	6	

2	(c)		Candidate responses to exemplify the mark range and cover each product to be added in an appendix • **Dimensions/ sizes/ weights** Dimensions/ sizes/ weights provided with units (e.g. g, mm etc) – these are appropriate for the product designed Accept imperial measurements (2 marks) Dimensions/ sizes/ weights provided with units, some may not be realistic for the product designed (1 mark) Measurements unclear/ units not provided (0 marks) • **Materials or ingredients** Specific material/ ingredient names provided, these are appropriate for the product designed (2 marks) Specific material/ ingredient names provided, some may be inappropriate for the product considering function or chosen manufacturing processes (1 mark) Generic material names provided e.g. wood, metal, plastic, fabric, food (0 marks) • **Processes for making, assembly and finishing** Allocate one mark per manufacturing process stage. No additional credit for duplications. Stages for making explained in sufficient detail for 3rd party manufacture. Appropriate processes described. (6 marks) Description of making suggests a good understanding of the processes described. Appropriate processes described (4 – 5 marks) Processes selected are well described, but inappropriate for the product or processes are appropriate but some points missing (3 marks)	2 2 6	

			Correct processes stated and ordered, but no additional detail provided, superficial response (2 marks) A suitable process for making part of the product identified (1 marks) No suitable processes named or described (0 marks)		
			• **Name of tools and equipment to be used** Appropriate tools/ machinery listed correctly named	2	2 x 1 marks
			• **Quality control checks to ensure consistency and accuracy** Quality control checks e.g. size, weight, shape, temperature, colour etc	2 Total 14 Marks	1 mark per check stated 1 check OR described with details = 2 marks

<table>
<tr><th>Question</th><th>Part</th><th>Sub Part</th><th>Marking Guidance</th><th>Mark</th><th>Comments</th></tr>
<tr><td>3</td><td>(a)</td><td></td><td>Any three from: contain, inform, preserve, protect, promote, display, transport, identify</td><td>3</td><td>3 x1 mark</td></tr>
<tr><td>3</td><td>(b)</td><td>(i)</td><td>Responses should relate to the functions of packaging. Do not award marks for simply stating the functions as marks were awarded for this in part a. The responses need to <u>explain</u> how the milk packaging fulfils these functions. Possible responses may include:
<table>
<tr><th>Function</th><th>Explanation</th></tr>
<tr><td>Protect</td><td>Tamper proof seal on plastic bottle, glass bottles break easily</td></tr>
<tr><td>Contain</td><td>Plastic bottles & cartons can be resealed and can lay down in fridge.
Glass bottles cannot be resealed – contents can easily spill if not stood upright
Handle
Materials are waterproof</td></tr>
<tr><td>Inform</td><td>Plastic bottles and cartons can be printed on – gives info such as a use by date, bar code etc. Easily identifiable contents – e.g. semi skimmed/ organic etc.
Glass bottles do not include labels.
Foil caps identify type of milk e.g. silver top = full fat milk. Difficult to identify once cap has been removed
Clear containers make it easier to tell how much milk is left.
You can add labels</td></tr>
<tr><td>Preserve</td><td>Sealing plastic bottles and cartons prevent milk being tainted by any other strong smells in the fridge.
Airtight.</td></tr>
<tr><td>Promote</td><td>Labels help to encourage sales – e.g. to promote as local e.g. Yorkshire milk on sale in this county, Scottish print pattern on labels in Scotland, Organic milk etc</td></tr>
</table>
Credit responses referring to food grade materials or washing/ sterilising. Glass bottles.

Transport – Tetrapack is lightweight bottles fit in crates/ tetrapack tessellated (classroom) for easier transportation</td><td>3</td><td>3 x 1 mark

1 mark – comparison made between the packaging solutions

1 mark of each explanatory point made to a maximum of 2 (see table left)</td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>3</td><td>(b)</td><td>(ii)</td><td>Possible responses may include:

<table><tr><td>Glass bottle</td><td>Glass is a non renewable material, but it can be reused and recycled. Reuse is preferable to recycling as cleaning bottles and refilling them requires less energy than recycling to form new bottles. Reuse is common for doorstep milk. Bottles are easy to recycle at bottle banks. If thrown away into landfill these bottles do not biodegrade Low energy requirement if reused.</td></tr><tr><td>Plastic bottles</td><td>2 different plastics used. Plastic comes from oil which is a non renewable material. Plastic bottles can be easily recycled either from doorstep recycling schemes or at refuse sites.
However quality suffers.</td></tr><tr><td>Tetra pack cartons</td><td>Composite of card with a plastic/ foil backing. Card is from a renewable source, however composites are difficult to recycle as it is not easy to separate out materials. Some but not all areas in the country have facilities to recycle these sorts of containers. Accept not recyclable.</td></tr></table>
3+ separate points made qualified with examples
Response well-structured with good use of appropriate design and technology and showing a good grasp of grammar, punctuation and spelling.

2+ points made with some explanation
Response reasonably well structured with some use of design and technology terminology with some errors in grammar, punctuation and spelling.

simplistic response e.g. possible danger identified such as choking hazards, but little further explanation
Response poorly structured with little or no use of design and technology terminology and with numerous errors in grammar, punctuation and spelling.

Some candidates may respond with points not made here. These should be credited if relevant.</td><td>5 – 6

3 – 4

1 – 2</td><td>Max 6 marks</td></tr>
</table>

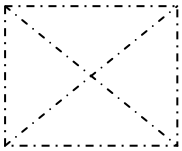
<table>
<tr>
<td>3</td>
<td>(c)</td>
<td></td>
<td>
<table>
<tr><th>Symbol</th><th></th></tr>
<tr><td>  </td><td>Accept, any of the following:

• Keep dry
• Don’t get wet
• Keep away from water
• Protect from water
• Not waterproof

Do <u>not</u> accept:
• Water resistant
• Waterproof
• Keep dry and waterproof as condradicts the meaning of protecting from water.</td></tr>
<tr><td>  </td><td>Accept either fragile or it can break easily BUT not it can break</td></tr>
</table>
</td>
<td>2</td>
<td>2 x 1 mark

For each correct meaning of the symbol, award 1 mark

Award 0 mark if the candidate has given more than 1 response for a symbol (including the correct answer).</td>
</tr>
</table>

Question	Part	Sub Part	Marking Guidance	Mark	Comments
4	(a)		**Tote bag:** • Pin the bag handles to the inside of the bag body • Tack in place so pins can be removed • Sew on the machine – usually done in a pattern as shown below for strength  **DVD rack:** • Mark position and drill holes correctly sized for the diameter of dowel to be used for the shelves • Put 2 bits of wood together and drill at the same time so the holes line up/ use a template • Add a small amount of PVA to the ends of the dowel • Wipe off excess glue **Breaded Chicken** • Whisk an egg • Make breadcrumbs by blitzing bread in a food processor • Set up three plates with flour, egg and breadcrumbs • Coat chicken in following order: Flour, Egg, Breadcrumbs • Frying the coated chicken makes the egg coagulate and as a result this attaches the coating to the chicken	5	1 mark for each point up to a **maximum of 5.** Accept naming tools, relevant quality checks etc relevant to joining process. Points which are irrelevant to joining do not award marks. E.g. marking out fabric to make bag, shaping the curve on the DVD rack etc.

4	(b)	(i)	Understanding that it is about identifying safety hazards/ dangers (1 mark) Putting in place measures to reduce the risk of injury during manufacturing (1 mark) Do not accept answers relating to safety of product	2	

4	(b)	(ii)	**Tote bag:** • **Risk** - Sewing finger • **Safety measure** - One at a machine at once, keep hands either side of the needle, Presser foot down **DVD rack:** • **Risk -** Drill through finger, Dust in eyes • **Safety measure** - Remove chuck key, Lower guard, Clamp the work Wear goggles, tie long hair back **Breaded chicken:** • **Risk –** Burns, Fire, Food poisoning from cross contamination, Undercooking • **Safety measure** - Pan handles turned inwards, Use a splatter guard, Control heat, Avoid use of metal spoons, Do not leave unattended, Use separate boards/ utensils for raw and cooked products, wash hands after touching raw poultry, Make sure chicken is cooked through – shouldn't be pink in the middle **Also accept:** Check machinery working correctly	3	Identification of a relevant risk e.g. burns when frying etc (1 mark) Description of safety procedures Either 2 procedures e.g. wear goggles, clamp work etc (2 x 1 mark) or one procedure with detailed explanation e.g. clamping the work stops it moving, means hands can be away from the drill (2 marks) Max 3 Marks