

# Mark Scheme (Results)

## Summer 2010

GCE

GCE Design and Technology (AS)  
6GR02  
Paper 01 Design and Technology  
in Practice

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## General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.
- Mark schemes will indicate within the table where, and which strands of QWC, are being assessed. The strands are as follows:
  - i) ensure that text is legible and that spelling, punctuation and grammar are accurate so that means is clear
  - ii) select and use a form and style of writing appropriate to purpose and to complex subject matter
  - iii) organise information clearly and coherently, using specialist vocabulary when appropriate

Question Number	Answer	Mark
1(a)	Folding box board (1)  <i>Note: Accept boxboard</i>	(1)
	(1x1)	

Question Number	Answer	Mark
1(b)	<ul style="list-style-type: none"> <li>• Offset lithography (1)</li> </ul> <i>Accept:</i> <ul style="list-style-type: none"> <li>• lithography (1)</li> <li>• litho (1)</li> <li>• offset litho (1)</li> </ul>	(1)
	(1x1)	

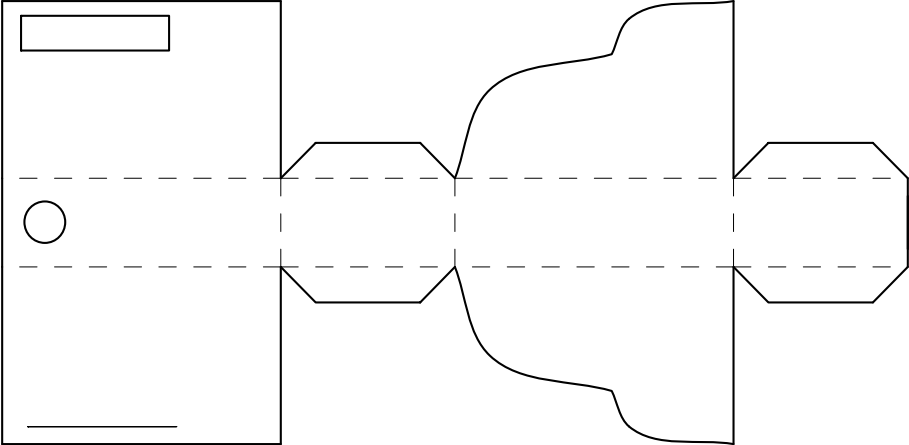
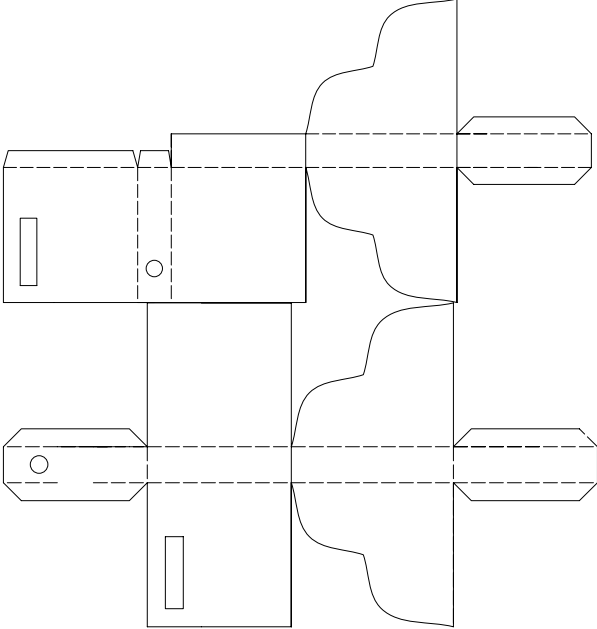
Question Number	Answer	Mark
1(c)	Any <i>two</i> of: <ul style="list-style-type: none"> <li>• Enhance the aesthetics/colours (1)</li> <li>• Make the product look more expensive/High Quality appearance (1)</li> <li>• Make the card stiffer/stronger/more durable (1)</li> <li>• Make the card moisture/liquid proof (1)</li> <li>• Protect against smell/impregnation of food (1)</li> <li>• Add protective layer to make surface more durable (1)</li> <li>• Protects from fading (1)</li> </ul>	(2)
	(2x1)	

Question Number	Answer	Mark
• 1 (d)	Any four points from: <ul style="list-style-type: none"> <li>• Automated / machine process for cutting/suitable for mass production (1)</li> <li>• Cutter for nets and 'odd' shapes (1)</li> <li>• Cutting and scoring achieved at the same time (1)</li> <li>• Multiple/identical sheets can be cut at the same time (1)</li> <li>• Accuracy/cuts cleanly/better quality finish (1)</li> <li>• Allows lay planning/tessellation (1)</li> <li>• Removes the human error when cutting (1)</li> <li>• Cost effective on large runs (1)</li> <li>• Die can be reused on another production run (1)</li> <li>• High speed process (1)</li> </ul> <i>Note: Do not accept cheap or fast</i>	(4)
	(4x1)	

Question Number	Answer	Mark
1(e)	<ul style="list-style-type: none"> <li>• To provide performance standards/regulation/independent tests/approval (1)</li> <li>• So that the packaging is (only one of the following points can be used): <ul style="list-style-type: none"> <li>▪ safe (1)</li> <li>▪ hygienic (1)</li> <li>▪ suitable for use (1)</li> <li>▪ ensure quality (1)</li> <li>▪ customer peace of mind (1)</li> <li>▪ legal (1)</li> </ul> </li> <li>• Products must comply with BSI standards (1) to have the BSI Logo/kite mark (1)</li> </ul> <p style="text-align: right;">(2x1)</p>	(2)

Question Number	Answer	• Mark
1(f)	<p>Any two from:</p> <ul style="list-style-type: none"> <li>• Commitment to continuous improvement (1) with Record at every stage to improve production and process/application for ISO 9000 (1)</li> <li>• Control over raw materials, records of every stage of production (1) to assist with quality of the complete product (1)</li> <li>• Covers complete lifecycle of product (1) with Working to reduce waste (1)</li> <li>• Quality built in with monitoring (1) in order to get the product right first time/within tolerance (1)</li> <li>• Works to customer satisfaction (1) reputation of company enhanced (1)</li> <li>• Encourages a strategic, team building approach (1) increasing higher/efficient levels of productivity/higher quality products (1)</li> <li>• Provides a high return on investment (1) by improving efficiency (1)</li> <li>• Continually improves process, products(1) and overall culture in which employees work (1)</li> </ul> <p><i>For maximum marks both the lead-in and the justification must be present and linked</i></p> <p style="text-align: right;">(2x2)</p>	(4)
<b>Total for question</b>		<b>14 marks</b>

Question Number	Answer	Mark
2(a)	<ul style="list-style-type: none"> <li>• Isometric (1)</li> </ul> <p style="text-align: right;">(1x1)</p>	(1)

Question Number	Answer	Mark
2(b)	 <p>Possible alternatives, note others exist especially locations of tabs</p>  <ul style="list-style-type: none"> <li>• 75% of Net must be shown for marks to be awarded</li> <li>• Net must be correct to access marks below.</li> <li>• Correct layout/outline (1)</li> <li>• Fold/crease lines shown as dotted lines or labelled for correct assembly (1)</li> <li>• Four glue tabs shown in correct position (1)</li> <li>• Correct curved section (1)</li> <li>• Correct position finger hole (1)</li> <li>• Correct position window (1)</li> </ul> <p style="text-align: right;">(1x1) (1x1) (1x1) (1x1) (1x1)</p>	(5)

Question Number	Answer	Mark
2(c)	<p>Two advantages :</p> <ul style="list-style-type: none"> <li>• Relatively inexpensive for limited funds (1) making it suitable for Personal documents.</li> <li>• Easy to manipulate/editing/alter (1) and so can shorten time spent on alterations/redrawing/ (1)</li> <li>• Can be emailed and sent electronically (1), so easy to share/saves posting (1)</li> <li>• Can be used in conjunction with modelling/3d view/rendering programmes (1) and so save money on costly real models (1)</li> <li>• The drawing and manufacturing can be linked (1) so can lead to accuracy in manufacturing/speed in manufacturing (1)</li> <li>• Integrated process (1) which can be linked to testing and QC software (1)</li> <li>• Drawings can embed issues i.e. cut lines/score lines/folds (1) to improve quality (1)</li> <li>• Range of fonts/grids/measurement/tools/zoom (1) to amend fine details (1)</li> <li>• It allows for collaborative working (1) with different designers producing parts remotely (1)</li> </ul> <p style="text-align: right;">(2x2) (2x2)</p>	(4)

Question Number	Answer	Mark
2(d)	<p>Advantages:</p> <ul style="list-style-type: none"> <li>• Temporary binding (1) and functional (1)</li> <li>• Easy to fit after training (1) and punch paper (1)</li> <li>• Inexpensive (only if qualified) (1) in terms of comb price and running costs/suitable for personal documentation (1)</li> <li>• Allows pages to open flat (1) provides easy viewing / don't have to hold open(1)</li> <li>• Pages can be added/removed (1) in-house using low-cost specialist machine (1)</li> </ul> <p>Disadvantages</p> <ul style="list-style-type: none"> <li>• Bulky (1) so reduces space in document folder (1)</li> <li>• Paper can tear (1) binder can open when pulled (1)</li> <li>• Not very strong/durable (1)not suitable for large documents as pages can easily fall out (1)</li> <li>• Need specialist machine to fit binder (1) so cannot be used unless specialist equipment obtained (1)</li> <li>• Does not look aesthetically pleasing (1) giving low quality impression (1)</li> </ul> <p style="text-align: right;">(2x1) (2x1)</p>	(4)
	<b>Total for question</b>	<b>14 marks</b>

Question Number	Answer	Mark
3(a)	<p>One from each of:</p> <p>Aesthetic</p> <ul style="list-style-type: none"> <li>• Coating can be shiny/matt (1)</li> <li>• Coating adds to the impression of quality (1)</li> <li>• Coating enhances colours (1)</li> </ul> <p>Functional</p> <ul style="list-style-type: none"> <li>• Coating protects the artwork (1)</li> <li>• Coating protects the paper from wearing/improved durability(1)</li> <li>• Coating adds to the thickness (1)</li> <li>• Assists in tear prevention (1)</li> <li>• Coating gives a good quality surface for printing on (1)</li> </ul> <p style="text-align: right;">(1x1) (1x1)</p>	(2)

Question Number	Answer	Mark
3(b)	<ul style="list-style-type: none"> <li>• Polypropylene (1)</li> </ul> <p><i>Note: Accept any phonetic spelling for example accept polyprop-e-lene</i></p> <p style="text-align: right;">(1x1)</p>	(1)

Question Number	Answer	Mark
3(c)	<p>Any one from the following:</p> <ul style="list-style-type: none"> <li>• Products produced on assembly/production line (1) so less skilled labour/workforce is needed (1)</li> <li>• Production broken into repetitive tasks (1) suitable for unskilled labour (1)</li> <li>• Bulk purchase of materials at lower prices (1) leads to lower finished unit costs (1)</li> <li>• large volume/quantities produced (1), so reducing individuality of products/standardised products (1)</li> <li>• automated process (1) can lead to reduced time to market (1)</li> <li>• Due to economies of scale product unit cost is low(1) However initial set up cost is high (1)</li> </ul> <p><i>Note: Candidates must justify their statement responses. Full marks cannot be achieved with 2 unrelated parts.</i></p> <p style="text-align: right;">(1x1) (1x1)</p>	(2)



Question Number	Answer	Mark
3(d)	<p>Candidates must give specific rather than generic responses.</p> <p>Preparation:</p> <ul style="list-style-type: none"> <li>• Check lithographic plates (1)</li> <li>• Print test pages (1)</li> <li>• Check ink quality (1)</li> <li>• Check paper quality (1)</li> <li>• Check guillotine/die cutter (1)</li> <li>• Check humidity suitable (1)</li> <li>•</li> </ul> <p>Processing:</p> <ul style="list-style-type: none"> <li>• Check colour density during print run (1)</li> <li>• Check colour registration during print run (1)</li> <li>• Check guillotine/die cut during process-ensure registration (1)</li> <li>• Visual Check during print run/Hickies/Halios/Smudging (1)</li> </ul> <p>Assembly:</p> <ul style="list-style-type: none"> <li>• Check paper insert for fit to DVD box (1)</li> <li>• Samples are finally checked for alignment and print quality (1)</li> <li>• Check alignment within box (spine etc) (1)</li> </ul> <p style="text-align: right;">(1x1) (1x1) (1x1)</p>	(3)

Question Number	Answer	Mark
3(e)	<p>Must Choose any three from one section:</p> <ul style="list-style-type: none"> <li>• Mechanical: <ul style="list-style-type: none"> <li>• timber is debarked (1)</li> <li>• timber is ground/crushed to form a pulp (1)</li> <li>• pulp is soaked for period of time in vast quantity of water (1)</li> <li>• often pulp has to be bleached (1)</li> <li>• pulp often contains impurities (1)</li> <li>• steam used to aid pulping process (1)</li> </ul> </li>   <li>• Chemical: <ul style="list-style-type: none"> <li>• timber is debarked (1)</li> <li>• timber is chipped/cut into fragments (1)</li> <li>• fragments are pounded (1)</li> <li>• pulp is treated with chemicals (acid or alkaline) (1)</li> <li>• this dissolves lignin (1)</li> <li>• treated with steam (1)</li> <li>• screened to ensure chips are correct size (1)</li> </ul> </li>   <li>• Waste: <ul style="list-style-type: none"> <li>• Recyclable/old paper + card screened + shredded (1)</li> <li>• shredded waste is pulped with water (1)</li> <li>• ink is chemically removed (1)</li> <li>• properties poor so chemicals/bonding agents added to stiffen (1)</li> <li>• often added to new paper/mixed with virgin fibres (1)</li> <li>• pigments added to change colour (1)</li> </ul> </li> </ul> <p style="text-align: right;">(3x1)</p>	(3)

Question Number	Answer	Mark
3(f)	<p>Any <b>three</b> from:</p> <ul style="list-style-type: none"> <li>• wet end/diluted pulp fed onto mesh where water is removed (1)</li> <li>• press/pulp is squeezed to remove excess water (1)</li> <li>• drying/heated rollers/Dandy Roll used to flatten (1)</li> <li>• roll paper into specific thickness (1)</li> <li>• calendaring/highly polished rollers (calendars) produce final smooth gloss paper finish (1)</li> <li>• paper rolled into large rolls to be transported (1)</li> <li>• vibrating belt to help drain water (1)</li> <li>• fibres interweave (1)</li> <li>• suction box and rollers draw out more water (1)</li> <li>• sizing agents added during drying process (1)</li> <li>• Rollers can be adjusted for thickness grades of paper</li> </ul> <p style="text-align: right;">(3x1)</p>	(3)
	<b>Total for question</b>	<b>14 marks</b>

Question Number	Answer	Mark
4(a)	<p>Any two from:</p> <ul style="list-style-type: none"> <li>• Transparent (1)</li> <li>• Tough/durable/does not break when dropped (1)</li> <li>• inert/does not affect the liquid (taste/safety) (1)</li> <li>• impermeable(1)</li> <li>• recyclable (1)</li> <li>• lightweight/does not add weight to product (1)</li> </ul> <p style="text-align: right;">(2x1)</p>	(2)

Question Number	Answer	Mark
4(b)	<p>Any three points from:</p> <ul style="list-style-type: none"> <li>• Ink can change colour (1) then any 2 off following:</li> <li>• Reacts with heat/cold (1)</li> <li>• Shows correct temperature (1)</li> <li>• for decoration (1)</li> <li>• Gimmick effect (1)</li> </ul> <p><i>Note:</i></p> <p>Must have colour change to get max marks. No lead statement, max 2 marks.</p> <p style="text-align: right;">(3X1)</p>	(3)

Question Number	Answer	Mark
4 (c)	<ul style="list-style-type: none"> <li>• Automated process (1)</li> <li>• Split Mould (1)</li> <li>• Cooled mould (1)</li> <li>• Heated plastic tube (parison) feed into mould (1)</li> <li>• Plastic - thermoplastic (1)</li> <li>• Tube clamped in split mould</li> <li>• Hot air forced in to mould (1)</li> <li>• After cooling product removed (1)/mould split (1)</li> <li>• Flashing trimmed (1)</li> </ul> <div style="text-align: center; margin-top: 20px;"> </div> <p style="margin-top: 20px;"><i>Note: If no sketches / no annotation max. three marks</i></p>	(4)

Question Number	Answer	Mark
4 (d)	<p>Any <i>five</i> points from:</p> <ul style="list-style-type: none"> <li>• Employers must liaise with HSE (1)</li> <li>• HSE, H&amp;S at work act and COSHH regulations applied (1)</li> <li>• Reduce exposure for employees (1)</li> <li>• Provide Control measures such as local ventilation (1)</li> <li>• Monitoring substances and levels of harmful substances (1)</li> <li>• Provide employees with information about substances (1)</li> <li>• Protect employees with PPE/use of PPE (1)</li> <li>• Provide first aid/showers and hygienic facilities (1)</li> <li>• Record incidents using accident book etc (1)</li> <li>• Undertake risk assessments (1)</li> <li>• Provide the safe storage and disposal of substances (1)</li> <li>• Warning material must be marked/labelled (1)</li> <li>• Warning/Safety signs provided (1)</li> <li>• Provide chemical spill facilities/accident procedures (1)</li> <li>• Provided training (1)</li> </ul> <p>Note 1: Please remember, this question focuses on what employers must do to protect employees.</p> <p>Note 2: Candidates must give specific rather than vague/generic responses.</p> <p style="text-align: right;">(5x1)</p>	(5)
	Total for question	14 marks

Question Number	Answer	Mark
5(a)	<p>Any five from:</p> <ul style="list-style-type: none"> <li>• Designer can select materials/colours (1)</li> <li>• Designer can simulate lighting and atmospheric effects to see product in 'real life'/virtual view (1)</li> <li>• Product can be viewed from any angle/zoom in/zoom out/</li> <li>• 3D (1)</li> <li>• Alterations can be made on screen (1)</li> <li>• Images used in marketing materials (1)</li> <li>• Images can be used by the designer to evaluate design with users (1)</li> <li>• Images can assist in production process (1)</li> <li>• Technique part of manufacturing process (1)</li> <li>• Can be electronically sent to clients/manufacturers (1)</li> <li>• Integral tools allows sizing/dimensions (1)</li> <li>• Visualise before time/money spent on modelling (1) (must clarify time modelling)</li> </ul> <p style="text-align: right;">(5x1)</p>	(5)

Question Number	Answer	Mark
5 (b)	<p>Any three from:</p> <ul style="list-style-type: none"> <li>• Slim/lightweight/suitable for portable devices (1)</li> <li>• Quick response to data input (1)</li> <li>• Range of colours on display(1)</li> <li>• Can be used to display photos/ moving images/web/email(1)</li> <li>• Low power so very little battery use (1)</li> <li>• Clear to see/high resolution (1)</li> </ul> <p style="text-align: right;">(3x1)</p>	(3)

Question Number	Answer	Mark
5 (c)	<p>Any six in total must have at least <b>one</b> from each section:</p> <p>Advantages</p> <ul style="list-style-type: none"> <li>• Passive (receive only) and active (transmit and receive) tags can be inbuilt into labels and products (1)</li> <li>• Auto price checking (1)</li> <li>• Telemetry (remote measurement and recording of info) (1)</li> <li>• Stock levels can be measured automatically/Auto reordering when low (1)</li> <li>• Don't have to scan products so reduces queue time when purchasing goods (1)</li> <li>• Anti theft properties/alarm trigger as products tags can hold unique info (1)</li> <li>• Marketing information can be made available/tracking product sales (1)</li> <li>• Tracking product use can provide information to manufacturers (1)</li> <li>• Tracking product during use can be used for guarantee information and warrantee info/product identity (1)</li> <li>• Disposal for recycling information (1)</li> <li>• simple to install in products for tracking (1)</li> <li>• Not easy to replicate information held (1)</li> <li>• Do not require direct line of sight to work (1)</li> <li>• Can assist emergency services in tracking products (1)</li> <li>• Range can be greater distance: Active (1)</li> </ul> <p>Disadvantage</p> <ul style="list-style-type: none"> <li>• Potential loss of privacy (1)</li> <li>• 1984/Big brother is watching you scenario (1)</li> <li>• Interference can hinder reception/affected by certain materials (1)</li> <li>• Range can be short: Passive (1)</li> <li>• Reliability still not known as RFID is relatively new (1)</li> <li>• Could be used by non-emergency services/ non-official services to monitor (1)</li> <li>• Adds cost (1)</li> </ul> <p><i>Note: To obtain full marks candidates need both advantages and disadvantages. If only ONE side of the argument max 5 marks.</i></p> <p style="text-align: right;">(6x1)</p>	(6)
	Total for question	14 marks
	Total marks for paper:	70 marks



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