

# Mark Scheme (Standardisation) Summer 2008 Final

GCE

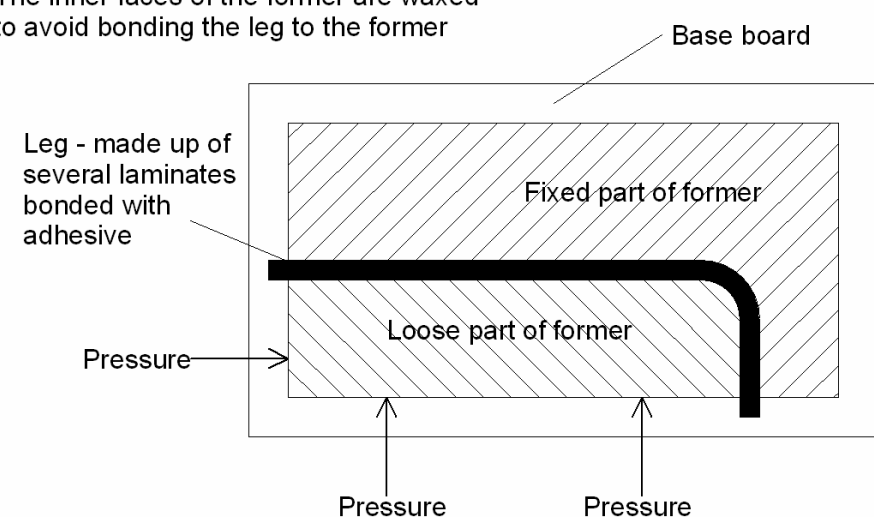
GCE D&T (6143/01)

## 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.

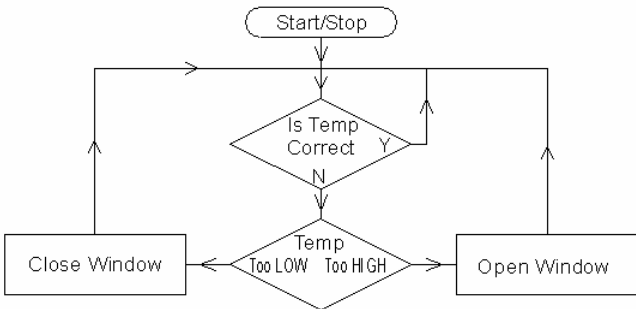
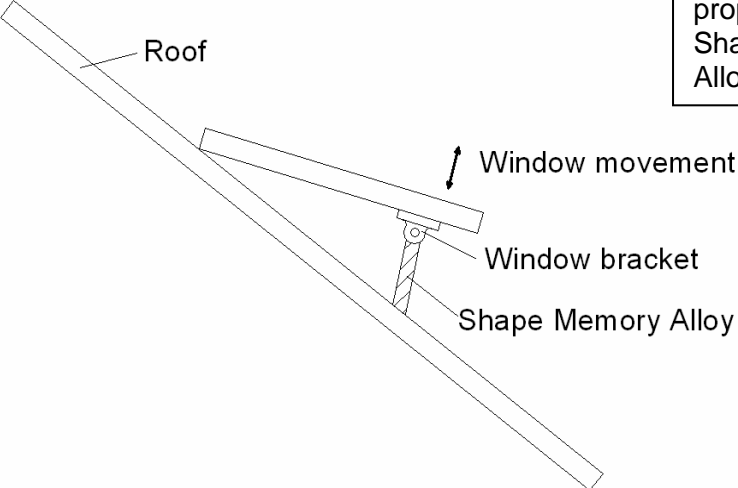
Question Number	Answer	Mark
1(a)	<p><b>No marks for packaging</b></p> <ul style="list-style-type: none"> <li>• Redesign products/manufacturing/moulds (1) so that they require less material to manufacture (1)</li> <li>• Reclaim surplus material (1) so that it can be reused in the same manufacturing process where possible (1)</li> <li>• Recycle materials (1) so that materials can be used in different manufacturing processes where possible (1)</li> <li>• Buy in only what material is required (1) so there is no surplus to dispose of (1)</li> <li>• Assemble/machine carefully/accurately (1) so there are fewer damaged components (1)</li> <li>• Quality control e.g. CMM/CNC (1) therefore reducing the number of faulty/waste items (1)</li> </ul> <p style="text-align: right;">(2x1) (2x1)</p>	4
1(b)	<ul style="list-style-type: none"> <li>• Specialisation (1) the work processes are given to a workforce with the specific skills to match the job (1)</li> <li>• Bulk buying of raw materials (1) at a lower unit cost (1)</li> <li>• Lower cost of capital (1) charged by providers of finance (1)</li> <li>• The spread of fixed costs (1) e.g. equipment (1) transport (1) between a larger number of units of production (1)</li> <li>• The concentration of an industry in one area (1) therefore attracting a pool of labour that can be retrained (1)</li> <li>• A large group of companies in one area (1) therefore attracting a larger network of suppliers whose costs are low due to their economies of scale (1)</li> <li>• Use of standard components (1) therefore limited need for specialist (expensive) parts to be manufactured (1)</li> <li>• Purpose built production lines (1) which speed up production (1) / reduce labour costs (1)</li> </ul> <p style="text-align: right;">(2x1) (2x1) (2x1)</p>	6
	<b>Total for question</b>	<b>10</b>

Question Number	Answer	Mark
2(a)	<p><b>Brand loyalty</b></p> <ul style="list-style-type: none"> <li>• Purchasing out of preference (1)</li> <li>• Repeat purchasing (1)</li> <li>• Expectation of quality (1)</li> <li>• Group identity (1)</li> <li>• Familiarity (1)</li> </ul> <p><b>Lifestyle marketing</b></p> <ul style="list-style-type: none"> <li>• The purchasing characteristics of a particular market group based on their lifestyles (1)</li> <li>• Companies base their marketing on geographic/demographic characteristics of population e.g. young professional, retired, affluent etc (1)</li> <li>• Match the needs of the individuals to particular products (1)</li> </ul> <p><b>Target market groups</b></p> <ul style="list-style-type: none"> <li>• Companies decide that they cannot supply all the potential market (1)</li> <li>• Companies limit the market that they market their products to (1)</li> <li>• Market research identifies the customers a company should target (market segment) (1)</li> <li>• Information based on geographic or demographic factors e.g. young professional, retired, affluent etc (1)</li> </ul> <p><b>Consumer demand</b></p> <ul style="list-style-type: none"> <li>• There is a gap in the market created by consumers</li> <li>• The rate of sale</li> <li>• Popularity/increased desire/fashion/trends</li> <li>• Suppliers need to keep existing customers supplied to meet the demand (1)</li> <li>• Suppliers must react to the 'pull' (demand) from customers and try to get new customers to change their brand loyalty (1)</li> </ul> <p style="text-align: right;">(2x1) (2x1) (2x1)</p>	6
2(b)	<ul style="list-style-type: none"> <li>• It gives an accurate account of transactions (1), therefore reducing human errors (1)</li> <li>• It provides data which can be loaded into spreadsheets (1), therefore allowing financial analysis (1)</li> <li>• It gives the means to monitor on a daily basis, the performance / popularity of all products (1), which gives the company the information necessary to react to demand fluctuations (1)</li> <li>• It allows for a full and responsive stock control system (1), therefore giving the company the information to carry just what is needed minimum storage facilities / minimum capital tied up (1)</li> </ul> <p style="text-align: right;">(2x1) (2x1) (2x1)</p>	6
<b>Total for question</b>		<b>12</b>

Question Number	Answer	Mark
3(a)	<ul style="list-style-type: none"> <li>• Once the former has been created (1) it can be used over and over again as required (1) to produce identical products (1)</li> <li>• Increased structural strength (1) as grain in one direction (1)/increased glue surface (1) / reduced short grain (1)</li> <li>• The thin laminates can be bent to a greater degree than solid timber (1) therefore allowing a wider range of shapes to be created (1)/ less wood to be used (1)</li> <li>• The laminated leg has great dimensional stability (1) there is less likely to deform (twist/warp) (1)</li> <li>• The shape is not cut from solid material (1) therefore less wastage (1)</li> <li>• Solid wood varies naturally (aesthetically and structurally) (1) therefore lamination gives greater uniformity (1)</li> <li>• Only the surface laminates need to be of a high quality (1) therefore reducing the cost of material used (1)</li> </ul> <p style="text-align: right;">(2x1) (2x1) (2x1)</p>	6
3(b)	<p>The inner faces of the former are waxed to avoid bonding the leg to the former</p> <div style="text-align: center;">  </div> <ul style="list-style-type: none"> <li>• The former/jig is designed and made (1)</li> <li>• The laminates are cut to the required thickness (1)</li> <li>• Part of the former can be fixed to a baseboard to aid clamping (1)</li> <li>• The inner faces of the former are waxed (or protected with paper/plastic)(1) in order to avoid the adhesive bonding the leg to the former (1)</li> <li>• Adhesive is applied to the inner faces of all laminates (1)</li> <li>• The loose part of the former is offered up to the laminates and clamped (1) in both directions to ensure correct shape (1)</li> <li>• Surplus glue is removed before it sets (1)</li> </ul> <p style="text-align: right;">(6x1)</p>	6
<b>Total for question</b>		<b>12</b>

Question Number	Answer	Mark
4(a)i	<p><b>Manufacturer</b></p> <ul style="list-style-type: none"> <li>• Speed of transfer of data (1)</li> <li>• No need to travel to consumer (1)</li> <li>• Ideas can be saved/backed up/secured electronically (1)</li> <li>• A wide range of media is available (1)</li> <li>• Reduced chance of human error in data handling (1)</li> <li>• Real-time data is available (1)</li> <li>• Access to company data from anywhere in the world (1)</li> <li>• Manufacturing data can be transferred from the design office directly to CNC machinery (1)</li> </ul> <p style="text-align: right;">(2x1)</p>	2
4(a)ii	<p><b>Consumer</b></p> <ul style="list-style-type: none"> <li>• Ability to have interactive websites therefore allowing customisation (1)</li> <li>• Ability to surf the web therefore getting access to a wider range of options (1)</li> <li>• Data is updated more frequently therefore the 'latest' information is always available (1)</li> <li>• Video conferencing enhances communication - face to face (1)</li> <li>• Speed of transfer of data (1)</li> <li>• Reduces the need to travel (cost implications) (1)</li> <li>• Security of data (1)</li> <li>• On-line order tracking is available (1)</li> </ul> <p style="text-align: right;">(2x1)</p>	2

Question Number	Answer	Mark
4(b)i	<ul style="list-style-type: none"> <li>• It is the branch of computer science concerned with developing computers that 'think and act like humans' (1)</li> <li>• Therefore intelligent systems should be able to consider large amounts of information simultaneously</li> <li>• Process them quickly in order to make rational, logical or expert judgements (1)</li> </ul> <p><i>Any combination of two marks</i></p> <p style="text-align: right;">(2x1)</p>	2
4(b)ii	<p><b>Voice recognition systems</b></p> <ul style="list-style-type: none"> <li>• These are computers that can recognise spoken words (1) An example e.g. Dictation/Sat Nav systems/Phones/Security systems (1)</li> </ul> <p><b>Natural language processing</b></p> <ul style="list-style-type: none"> <li>• If successfully developed, NLP will allow computers to 'understand' human languages (1) and be able to respond accordingly (1)</li> </ul> <p style="text-align: right;">(2x1)</p>	2
	<b>Total for question</b>	<b>8</b>

Question Number	Answer	Mark
5(a)	 <p style="text-align: right;">(4x1)</p>	4
5(b)	<p>A Shape Memory Alloy is an alloy that, after being deformed, can recover its original shape (1) when it is heated/electric current (1)</p> <p style="text-align: right;">(2x1)</p>	2
5(c)	<ul style="list-style-type: none"> <li>• Opens with heat (1)</li> <li>• Close by spring / gravity (1)</li> <li>• Work in conjunction with window (1)</li> </ul> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p>Any diagram which demonstrates the property of the Shape Memory Alloy</p> </div>  <p style="text-align: right;">(3x1)</p>	3
5(d)	<ul style="list-style-type: none"> <li>• Some materials are more common than others (1)</li> <li>• Some materials require less/more processing/transport (which costs money) before they can be used (1)</li> <li>• Some materials cost less/more to produce/extract (1)</li> <li>• The availability of a material will drive the cost up / down (1)</li> </ul> <p style="text-align: right;">(3x1)</p>	3
<b>Total for question</b>		<b>12</b>



Question Number	Answer	Mark
6(a)	<ul style="list-style-type: none"> <li>• Carbon fibres are very strong in comparison to other materials (1) therefore affecting a greater protection for the wearer (1)</li> <li>• The increased strength to weight ratio of carbon fibre (1) means the body armour is significantly lighter and easier to wear (1)</li> <li>• Carbon fibre can be easily moulded into intricate shapes (1) therefore producing 'ergonomic' mouldings (1)</li> </ul> <p style="text-align: right;">(2x1) (2x1)</p>	4
6(b)i	<p><b>Advantages</b></p> <ul style="list-style-type: none"> <li>• Once installed (1) the running costs are relatively low (1)</li> <li>• Little if any maintenance is required (1) therefore saving on servicing costs (1)</li> <li>• If a surplus of energy is produced it can be sold to the central grid (1) therefore lowering energy bills still further(1)</li> <li>• No waste products (1) therefore reduced damage to the environment (1)</li> <li>• Renewable/plentiful supply (1) so there is a reduced risk of price fluctuation (1)</li> <li>• Provides power where other sources may not be available (1) therefore more areas accessible/useable (1)</li> </ul> <p style="text-align: right;">(2x1) (2x1)</p>	4
6(b)ii	<p><b>Disadvantages</b></p> <ul style="list-style-type: none"> <li>• The appearance may be considered to be unsightly (1) therefore not passing planning regulations (1)</li> <li>• The initial cost of purchase and installation is relatively high (1) therefore consumers must remain in their house for several years in order to recoup their outlay (1)</li> <li>• Storage e.g. batteries may be necessary (1) which takes up room/is a high initial expense/increases maintenance (1)</li> <li>• It is only as effective as the local climate (1) therefore often not at its best when most needed</li> <li>• A large set-up is needed to produce enough electricity (1) therefore high set-up costs (1)</li> </ul> <p style="text-align: right;">(2x1)</p>	2
<b>Total for question</b>		<b>10</b>

Question Number	Answer	Mark
7(a)	<p><b>Use of product</b></p> <ul style="list-style-type: none"> <li>• Explain that a product could give off less pollution (1) e.g. the more a car is used the greater the emissions (1) therefore it is better to produce cars which are more fuel efficient (1)</li> <li>• Extending the life of the product should be considered (1) e.g. the product should be manufactured from suitable materials for the environment it will be in (1)</li> <li>• Explain how the product can be designed so that it uses minimum energy (1) e.g. so that a car can be designed to fulfil its intended use without 'surplus' power / size / weight (1)</li> </ul> <p style="text-align: right;">(2x1) (2x1)</p>	4
7(b)	<p><b>Recycle/disposal</b></p> <ul style="list-style-type: none"> <li>• Explain that it is necessary to reduce the environmental impact of a product on disposal (1) e.g. limit the use of toxic materials to a minimum(1) use biodegradable materials where possible (1) Arrange for the collection of none disposable materials/items (1)</li> <li>• Explain that it is necessary to have a strategy for recycling (1) e.g. there are so many different materials used to produce a car that it is important to design in such a way that the recyclable materials/components can be extracted more easily at the end of the product's usable life (1)</li> <li>• Explain that some essential materials/components used are not an economically viable option to recycle(1) but these should be kept to a minimum (1)</li> </ul> <p style="text-align: right;">(2x1) (2x1)</p>	4
<b>Total for question</b>		<b>8</b>

Question Number	Answer	Mark
8(a)	<p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>• The use of EPOS (1) allows manufacturers to monitor/analyse current trends (1) and respond to market demand (1)</li> <li>• Electronic market research (1) gives a far faster and more widespread sample of consumer preferences (1)</li> </ul> <p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• Electronic designs can be transferred quickly and easily (1) which reduces the need to travel(1)/ store large physical designs (1)</li> <li>• Designs can be changed/edited/tested/modelled quickly (1) which enables companies to respond to changing consumer demand(1)</li> </ul> <p><b>Manufacture</b></p> <ul style="list-style-type: none"> <li>• Designs can be electronically downloaded to CNC machines(1) which reduces the need have the manufacturing on the same site as the design process (1)</li> <li>• Computers have the ability to integrate automatic storage and retrieval systems (1) with the manufacturing process (1) therefore allowing more efficient production (1)</li> <li>• Quality control (1) to ensure that all items are within tolerance (1)</li> </ul> <p><b>Distribution</b></p> <ul style="list-style-type: none"> <li>• The consumer can use on-line tracking (1) to see when their product will be ready for collection/completion (1)</li> <li>• Distribution can be organised electronically (1) therefore the efficiency and reduced cost of transport increases profitability (1)</li> </ul> <p><i>Candidates must address all stages, maximum seven marks if only three stages addressed.</i></p> <p style="text-align: right;">(2x1) (2x1) (2x1) (2x1)</p>	8
<b>Total for question</b>		8
<b>Total for paper</b>		80