

# **Manufacturing**

General Certificate of Secondary Education

Unit **B232**: Manufacturing Processes

## **Mark Scheme for January 2013**

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

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Question		Answer	Marks	Guidance
1	(a)	Clothing and textiles – Waterproof jacket Food and drink – Sponge cake Motor manufacture – Gearbox Chemical and pharmaceutical – Shower gel Electrical – Vacuum cleaner Furniture – Coffee table  (6x1)	6	
	(b)	No mark for product  One mark for an appropriate modern material or technology  Examples: Gearbox – CNC machining Shower gel – Soap gelling agents Sponge cake – modified starches Waterproof jacket – Gore-Tex Coffee table – Foil wrapped/veneered MDF Vacuum cleaner – cyclone technology	1	Do not accept generic terms such as 'plastic'
	(c)	One mark for one of the following sectors:  Machinery and equipment; Packaging; Electronic and communications; Paper and print  Examples:- Machinery and equipment – centre lathe; crane Packaging – bean can; cardboard box Electronic and communications – mobile phone; Satellite Navigation Paper and print – magazine; calendar  (1+1)	2	

Question		Answer	Marks	Guidance
2	(a)	No mark for naming product  One mark for each of two tools appropriate to the product given.  (2x1)	2	Tools must clearly relate to the product given
	(b)	Descriptions must include reference to the safety precautions taken. Up to two mark for a clear description.  Examples:- Use of machine guards (1) to protect from entanglement/flying debris/swarf (1). Wearing goggles (1) to prevent material/ingredients getting into eyes (1).  2 x (1+1)	4	
3	(a)	Client Brief Research Develop designs Presenting designs to a client Testing  (5x1)	5	Allow modified wording of stages Eg 'Developing designs'; 'presenting designs';

Question	Answer	Marks	Guidance
(b)	<p>One mark for modern technology used; one mark for description of use.</p> <p>Examples:            Use of the internet to source/import parts for design            Use of CAD packages to produce drawings/3D images            PowerPoint presentations to client            Rapid prototyping            On-screen testing packages for computer            Use of digital spreadsheets to calculate costs and monitor changes</p> <p style="text-align: right;">2x (1+1)</p>	4	<p>Allow use of the same technology for each method described. Descriptions of applications must be distinctly different.</p>

Question		Answer	Marks	Guidance
4	(a)	<p>One mark for naming the check made; one mark for a description.</p> <p>Examples:            Measuring the size of a component using a micrometer            Checking the weight of a cake on scales            Checking the shape of material with a template</p> <p style="text-align: right;">(1+1)</p>	2	
	(b)	<p>One mark for each of two appropriate pieces of equipment.</p> <p>Examples:            Measuring equipment (vernier/micrometer/gauges); digital scales; templates; hardness testing machine; temperature probe; abrasion testing machine</p> <p style="text-align: right;">(2x1)</p>	2	Allow reference to tool used in part (a)
	(c)	<p>One mark for example of use; one mark for technology used; one mark for detail of use.</p> <p>Example:            Moulded plastic product removed from injection moulding machine by robot arm (1); held in front of scanner (and rotated); scanner compares product digitally with master (1); product rejected if faulty/inaccurate (1)</p> <p style="text-align: right;">(3x1)</p>	3	

Question		Answer	Marks	Guidance	
5	(a)	<p>One mark for each of three relevant factors.</p> <p>Examples:            Cost            Manufacturing processes needed            Availability            Recyclability/environmental issues            Safe to work with            Physical properties            Colour availability            Easy to machine/form/fabricate/use            Ease of storage</p> <p>(3x1)</p>	3		
	(b)	(i)	<p>One mark for modern material; one mark for description of use.</p> <p>Examples:            Flexi-ply used in furniture manufacture            Kevlar in protective vest</p> <p>(1+1)</p>	2	<p>Accept use of a 'smart' material</p> <p>Example:-            SMA used to spectacle frames</p>
		(ii)	<p>One mark for appropriate example; Up to two further marks for explanation. Must include reference to change to material (1) and 'external stimulus' (1).</p> <p>Example:            Photochromic dye in child's mug; changes colour when temperature reaches prescribed limits.            Shape memory alloy.</p> <p>(3x1)</p>	3	Do not reward simple repetition from part (6)(i)

Question	Answer	Marks	Guidance
6	<p>One mark for an example of use; one mark for IDCT used; one mark for description of use.</p> <p>Research: Web, search engines, email questions, contact suppliers/customers via email.</p> <p>Example; The internet is used to search for information relating to the product (1) so that pictures can be printed (1) and used to create a market research questionnaire (1)</p> <p>Developing design ideas: CAD, drawing tablet</p> <p>Presenting design to a client: Use of a projector, prototyping, cad images</p> <p style="text-align: right;">(3+3+3)</p>	9	
7	<p>One mark for example; one mark for modern technology; one mark for description of use.</p> <p>Examples: Using air-conditioning to automatically monitor the temperature (1) so its adjusted to best suit the workers (1), constantly monitoring/changing (1).</p> <p>Robots are used in hazardous areas (1), operators don't have to enter, remote working/control (1). Workers kept out of dangerous environments (1).</p> <p style="text-align: right;">(3+3)</p>	6	

Question		Answer	Marks	Content	Guidance
					Levels of response
8*		Six marks for a discussion or critical evaluation of issues relating to the introduction of new technologies into production methods	6	<p>Response may include reference to the following points:</p> <ul style="list-style-type: none"> <li>Cost of replacing/updating machines</li> <li>Effects on workforce/redundancies</li> <li>Is extra production required</li> <li>Training staff on new technologies</li> <li>Long-term return on investment</li> <li>Changes needed to factory layout/services</li> <li>Energy/environmental issues</li> </ul>	<p><b>Level 3 (5–6 marks)</b> Thorough analysis showing a clear understanding of the issues to be considered by a manufacturer when introducing new technologies. Specialist terms will be used appropriately and correctly. The information will be presented in a structured format. The candidate can demonstrate the accurate use of spelling, punctuation and grammar.</p> <p><b>Level 2 (3–4 marks)</b> Adequate discussion showing an understanding of the issues to be considered by a manufacturer when introducing new technologies. There will be some use of specialist terms, although these may not always be used appropriately. The information will be presented for the part in a structured format. There may be occasional errors in spelling, punctuation and grammar.</p> <p><b>Level 1 (0–2 marks)</b> Basic discussion showing limited understanding of the issues to be considered by a manufacturer when introducing new technologies. There will be little or no use of specialist terms. Answers may be ambiguous or disorganised. Errors of spelling, punctuation and grammar may be intrusive.</p>
		<b>Total</b>	<b>60</b>		

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