

# **Manufacturing**

General Certificate of Secondary Education

Unit **B234**: Impact of Modern Technologies on Manufacturing

## **Mark Scheme for June 2011**

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Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

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Question		Expected Answers	Marks	Rationale
1	(a)	<p><b>Complete the links below to identify which manufacturing sector makes the products listed.</b></p> <p>Paper and print – Magazine            Clothing and textiles – Tracksuit            Electrical – Toaster            Machinery and equipment – Hydraulic press            Food and drink – Chocolate bars            Furniture – Bedside table            Packaging – Bubble wrap</p> <p>One mark for each correct link (7x1)</p>	[7]	
	b	<p><b>(i) Select one manufacturing sector from part (a) State one modern material, component or ingredient used in products made in that sector.</b></p> <p>Example:            Clothing and textiles – photo/thermochromic dyes</p>	[1]	<p>No mark for naming sector.</p> <p>Do not accept chemical and pharmaceutical, electronic and communications or motor manufacturing</p>
		<p><b>(ii) Describe how the modern material, component or ingredient is used in the manufacture of the products.</b></p> <p>One mark for example of use; one mark for clear description of how it is used</p> <p>Example: Thermochromic dyes used in childrens' clothing change colour if the child gets too hot</p> <p>(1+1)</p>	[2]	<p>If response to (i) is chemical and pharmaceutical, electronic and communications or motor manufacturing, reward as if sector is correct</p>

Question		Expected Answers	Marks	Rationale
2	(a)	<p><b>Name two different manufacturing processes carried out in a sector of your choice.</b></p> <p>One mark for each process named if relevant to sector named (2x1)</p>	[2]	No mark for naming sector
	(b)	<p><b>Describe how modern technology is used in each of the manufacturing processes identified in part (a).</b></p> <p>One mark for naming the technology; one mark for description of use 2 x (1+1)</p>	[4]	
3	(a)	<p><b>Describe the impact of modern technologies on each of the following.</b></p> <p>(i) Health and safety at work – use of guarded CNC machines means workers are safer; robots working in unsafe conditions</p> <p>(ii) Product quality – use of modern materials to improve products; computer control gives consistent results</p> <p>(iii) Materials – recycling materials cut down use ; new processes/ materials reduce amount needed; new materials easier to process; degradable materials</p> <p>One mark for example / impact; plus one additional mark for relating it to modern technology 3 x (1+1)</p>	[2]  [2]  [2]	Do not reward references to PPE unless specific reference is made to modern technology.

Question		Expected Answers	Marks	Rationale
4	(a)	<p><b>Give three benefits to the designer of using CAD.</b></p> <p>Ease of making changes to designs; ability to import from other areas; easy storage of designs; ease of sharing designs; ability to produce 3D images/animations; (3x1)</p>	[3]	One word responses need clarification
	(b)	<p><b>Explain how a prototype for a product of your choice could be made using CAM.</b></p> <p>Explanation may include reference to:</p> <p>computer software application CAM/CNC machine used detail of operation (3x1)</p>	[3]	
	(c)	<p><b>Give two benefits to manufacturers of using CAM in the manufacture of their products.</b></p> <p>Increased output; reduction in workforce costs; consistent quality of products; no 'breaks' needed; quick and easy to change product (2x1)</p>	[2]	

Question		Expected Answers	Marks	Rationale
5	(a)	<p><b>State the meaning of each of the following symbols.</b></p> <p>Symbol 1 – Operation            Symbol 2 – Transport/movement            Symbol 3 – Inspection</p> <p style="text-align: right;">(3x1)</p>	[3]	
	(b)	<p><b>Explain how a flow process chart could be used to improve manufacturing output.</b></p> <p>Explanation may include reference to:            reduction in waiting time            reducing distance/time for movement            improving operations/methods to make quicker (could have reference to chart given)</p> <p style="text-align: right;">(3x1)</p>	[3]	
	(c)	<p><b>Explain one benefit to the manufacturer of carrying out quality control during the manufacture of a product.</b></p> <p>Cuts down waste by reducing scrap; ensures all operations run smoothly; saves time in remaking faulty products;            One mark for benefit 0 to 2 marks for explanation</p> <p style="text-align: right;">(3x1)</p>	[3]	Benefit <b>must</b> be to the manufacturer

Question		Expected Answers	Marks	Rationale
6	(a)	<p><b>Explain one benefit of global trading.</b></p> <p>Cheaper manufacturing costs in 'developing' countries; ability to manufacture products near markets; helps developing countries; keeps product costs low One mark for benefit plus one mark for explanation (1+1)</p>	[2]	
	(b)	<p><b>Describe two possible disadvantages of global trading.</b></p> <p>Loss of jobs in existing companies; environmental effects of transporting products; increased pollution in 'developing' countries; possible worker exploitation; quality issues; time issues; transportation cost / delays One mark for <b>each</b> disadvantage plus one mark for <b>each</b> description 2 x (1+1)</p>	[4]	
7	(a)	<p><b>Explain how the following can help towards reducing manufacturing waste.</b></p> <p>(i) Recycling – reduces use of raw materials; cuts down materials processing cost/energy used</p> <p>(ii) End-of-life disposal of products – allows parts to be reused/materials recycled; reduces waste materials from used products</p> <p>(iii) Material choice – use of materials easier to extract/process; use of materials suited to low-waste processes; selection of materials with properties allowing less to be used (modern materials/stronger materials) 3 x (3x1)</p>	[3]  [3]  [3]	

Question	Expected Answers	Marks	Rationale
8*	<p><b>Discuss the impact of modern manufacturing on local environments.</b></p> <p>Six marks for a discussion or critical evaluation of relevant implications.</p> <p>The response may include the following points:            Atmospheric/river pollution in locality; increased traffic congestion; effects on property/roads; noise from machines; destruction of habitat for factory building; 24 hour working, job loss, unemployment</p> <p>Level 1 (0 – 2 marks)            Basic discussion showing some understanding of the impact of modern technology on local environments. 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> <p>Level 2 (3 – 4 marks)            Adequate discussion showing understanding of the impact of modern technology on local environments. There will be some use of specialist terms, although these may not always be used appropriately. The information will be presented for the most part in a structured format. There may be occasional errors in spelling, punctuation and grammar.</p> <p>Level 3 (5 – 6 marks)            Thorough analysis showing a clear understanding of the impact of modern technology on local environments. 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>	[6]	
<b>Total marks for paper</b>		<b>[60]</b>	

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