OCR
RECOGNISING ACHIEVEMENT

GCSE

Manufacturing

General Certificate of Secondary Education

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

Mark Scheme for June 2012

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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			Answer	Marks	Guidance
1	(a)		**Complete the links below to identify which manufacturing sector makes the products listed**. Paper and print to Calendar Clothing and textiles to Swimming Costume Electrical to Hair Straighteners Chemical and pharmaceutical to Hairspray Food and drink to Frozen vegetables Furniture to Garden bench Packaging to Tissue box (7x1)	**[7]**	Award one mark for each correct link
	(b)		**Select one product from the list above.** **State one modern technology used in that product.** Award one mark for modern technology appropriate to the selected product.	**[1]**	Technology must relate to the chosen product and should be an integral part of the product rather than a technology used during manufacture. Accept terms such as: Gortex, Kevlar, Carbon fibre
	(c)		**State one sector not in the list above and give an example of a product from that sector.** **Machinery and equipment** • Power drill • Wheelbarrow • Washing machine **Electronic and communications** • Touch screen • Domestic WiFi • Navigation systems **Motor manufacturing** • Seat belts • Trailers • Caravans (1+1)	**[2]**	Award one mark for naming a sector different from those in part (a) and one mark for naming a product relevant to the chosen sector

Question			Answer	Marks	Guidance
2	(a)		**Name two different processes carried out in a manufacturing sector of your choice.** Process must relate to the manufacture of a product and could include: Material removal processes e.g. cutting, sawing, drilling, milling, Shaping and manipulation e.g., forming, moulding, bending, Joining and assembly e.g., welding, brazing, soldering, riveting, screwing, Heat and chemical treatment e.g., plating, hardening, annealing, Surface finishing e.g., polishing, painting, icing, Packaging (2 x 1)	**[2]**	No mark for naming a sector. Award one mark for a process that is relevant to the chosen sector. Do not reward items of machinery/tools e.g., lathe, miller, pillar drill.
	(b)		**Describe how quality control techniques are applied in each of the manufacturing processes identified in part (a)** Quality control techniques could include answers e.g., visual checks, weighing, measuring, 2 x (1+1)	**[4]**	Award one mark for naming a suitable quality control and one mark for a description.
3	(a)		**Describe the impact of modern technologies on each of the following:** **Workforce:** e.g., Change in work patterns / shifts, less manual work, workers may need to be retrained, possible redundancies **Environment:** e.g., Less waste materials, more efficient machinery using less power, lower carbon pollution due to increased use of sustainable energy sources,		Award one mark for a relevant point and an additional one mark for a description

Question			Answer	Marks	Guidance
			Disposal of products: e.g., Recycling / reuse of waste materials, use of biodegradable materials, reduced packaging, more efficient use of materials. (3 x 2)	**[6]**	
4	**(a)**		**Give three factors that need to be considered by a designer when using CAD/CAM.** Answers could relate to: manufacturing processes being used, batch sizes, materials being used, compatibility of machine to process, skill levels, tool access, tool path, complexity of product being manufactured, cost effectiveness, environmental impact (3 x 1)	**[3]**	Award one mark for a named factor, and a further two marks for a description of the factor. Some justification required for full marks.
	(b)		**Give three benefits to a manufacturer of producing a prototype before making the final product.** Answers could include e.g.' test the manufacturing process, check that materials are suitable, get client feedback, saves valuable materials, check for mistakes, better production planning achieved, allow early modifications to be made (3 x 1)	**[3]**	Award one mark for naming each benefit
	(c)		**Explain what is meant by the term 'remote manufacture'.** Answers could include the following points: electronic transfer of design/files, design and manufacture in different location, use of cost effective labour against high skill design,	**[3]**	Award one mark for a limited explanation of remote manufacture i.e., manufactured in a different country. Award a further mark for an explanation in more detail e.g., availability of labour, machinery, skills. Justification required in terms of explaining benefits for full marks.

Question			Answer	Marks	Guidance
5	(a)		**One product from a batch fails to meet the specification during manufacture.** **What term could be used to describe the failed product?** Answers could include terms e.g., Scrap, reject, faulty, waste, unacceptable.	**[1]**	Award one mark for correctly named term
	(b)		**Give three ways this could affect the company financially.** Answers could include e.g., cost of remaking failed item in terms of material cost, time wasted, energy used, disposal costs, (3 x 1)	**[3]**	Award one mark for each relevant reason
	(c)		**Describe two factors which should be considered when disposing of products.** Answers could include: Re-use, recycling, cost of disposal, landfill, health and safety, environmental contamination, (2 x 2)	**[4]**	Award one mark for each named factor and one mark for description
6			**Describe three factors that should be considered by manufacturing companies when selecting materials, components and/or ingredients.** Answers could include: characteristics, quality, durability, ease of use, availability, storage, possible training required in handling, cost, time wasted, health and safety Ensure materials are compatible with the processes being used, avoid having to reform for process, possible effects on the environment. (3 x 2)	**[6]**	Award one mark for point made and one mark for description

Question			Answer	Marks	Guidance
7			**Explain, using examples, how the following could affect a manufacturing company's image.** **Fair trade**: Manufacturers who sell fair trade products are ethical, gives employment and a fair deal to poor areas of the world, could generate higher costs **Health and safety:** A poor health and safety record results in struggle to get labour, more accidents means bad publicity and fines, product may be dangerous, **Quality standards**: Get a reputation for good quality products which will sell, poor quality means less product sales, negative image for bad quality (3 x 3)	**[9]**	Award one mark for an example; one mark for description of issues involved; one mark for clear explanation Justified responses showing understanding of issues needed for full marks

Question			Answer	Marks	Guidance	
					Content	**Levels of response**
8*			**Award up to six marks for a discussion or critical evaluation of relevant implications regarding the impact that modern manufacturing have on a company's production of waste**		**Responses must relate to the generation of waste materials due to the implementation of modern manufacturing methods** Examples and relevant points could include:	**Level 3 (5 – 6 marks)** Candidates provide a thorough analysis and show a clear understanding of the required question material. Specialist language and terms would be used in the appropriate areas being discussed and the required information will be well structured in its presentation.

Question			Answer	Marks	Guidance	
					Content	**Levels of response**
				[6]	Higher levels of waste due to increased mass production. Possible reduction in waste due to computer control of materials (e.g., CAD/CAM), and closer monitoring of manufacturing process. Higher value of waste materials, so more is re-used / recycled. Handling of new materials may need extra safety training/protection. Traceability of waste materials makes disposal more difficult Possible environmental consequences,	Candidates will demonstrate an accurate level of spelling, punctuation and grammar. **Level 2 (3 – 4 marks)** Candidate provides an adequate discussion which shows a reasonable level of understanding of the question material. There will be some evidence of the use of specialist language although not always in the appropriate areas being discussed. Information, for the most part, will be reasonably structured but, again, may contain occasional errors in spelling, punctuation and grammar. **Level 1 (0 – 2 marks)** Candidate provides a basic discussion which shows some understanding of the question material but uses little or no specialist language. Answers may well be ambiguous or disjointed. Contains obvious errors in spelling, punctuation and grammar
			Total	**60**		

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