OCR
Oxford Cambridge and RSA

GCSE

Manufacturing

Unit **B232:** Manufacturing Processes

General Certificate of Secondary Education

Mark Scheme for June 2014

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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.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

MARK SCHEME:

Question			Answer	Mark	Guidance
1	(a)		**Manufacturing sectors produce different products. Name two different manufacturing sectors and, for each, name two products that are made in that sector.** Sectors: Chemical and pharmaceutical Clothing and textiles Electrical Food and drink, Furniture Machinery and equipment Packaging, Electronic and communications Motor manufacturing, Paper and print. 2 x (1 + 2)	**[6]**	Award 1 mark for naming a correct sector and one mark for each viable product from that sector. Sectors must be chosen from those in the current specification. Do not allow repeat products across sectors
	(b)		**For one of the products you have chosen in part (a) above, describe how modern technology is used in its manufacture.** Answers could include: Use of CAD/CAM, CIM, robotics, PLC's, modern / smart materials, modern printing methods, moulding/cutting methods	**[2]**	No mark for naming a product. Award up to two marks for a suitable explanation
2	(a)		**Complete the chart below by inserting the following manufacturing stages in the correct order.** Production planning Processing and production Assembly Final quality check Dispatch (5x1)	**[5}**	

Question			Answer	Mark	Guidance
	(b)		**Name one tool or item of equipment that would be used during the packaging stage** Stanley knifes, wrapping tape dispensers, heat shrink applicators, food standard cling film, scissors, shears, conveyor systems, pick and place machines. (1 x 1)	**[1]**	Award one mark for naming a correct tool or item of equipment. Accept consumables e.g., bubble wrap, adhesive tapes as BOD for 1 mark
	(c)		**Describe one safety precaution that should be taken when using the tool or item of equipment named in part (b).** Answers could include: Wear appropriate P.P.E, when cutting material for packing, loading cakes / buns / bread into baking ovens, handling chemicals, suitable training	**[2]**	Award one mark for a relevant activity and one mark for the description. Some justification required for full marks
3	(a)	(i)	**Give two examples of each of the manufacturing processes shown below.** Forming: Bending, hammering, forging, injection moulding, vacuum forming, pastry rolling.	**[4]**	Award one mark for naming each of two correct processes e.
		(ii)	Finishing: Polishing, painting, varnishing, anodizing, icing, decorating, trimming, electroplating, galvanising, powder coating, etching, oil bluing/blackening, laminating, (2 x 2)		Award one mark for naming each of two correct finishing processes. Do not accept consumables such as paint, varnish etc.
	(b)		**Describe two benefits to a company of using Information, communication and digital technologies in the supply of components.** Use of internet / e-mail for stock ordering, can track orders using bar codes, use of JIT to save storage space spreadsheets (2 x 2)	**[4]**	Award up to two marks for a correct answer. Some justification is required for full marks. Accept any suitable reference to stock control.

Question			Answer	Mark	Guidance
4	(a)		**Explain why a manufacturer would make a prototype before going into full scale production.** Trial run of a product, evaluation of materials, components, ingredients and processes.	**[3]**	Award up to two marks for a correct answer. Justification required for full marks
	(b)		**Describe one method that could be used to manufacture a prototype.** Rapid prototyping technology, CAD simulation, SLA (Stereo Lithography Apparatus), 3D printing, SLS (Selective Laser Sintering), make by hand.	**[2]**	Award one mark for naming a process and a further one mark for a complete description. Do not accept CAM Do not accept just laser cutting unless justified.
5	(a)		**Composite materials are increasingly used in the manufacture of products.** **Explain, using one example, what is meant by the term 'composite material.'** A material that comprises two or more different constituents that are not chemically combined. Examples could include: Kevlar used in safety clothing, the use of carbon fibre for motor car bodies and aeroplane wings, concrete, GRP, MDF, block-board, chipboard, pastry	**[3]**	Award one mark for naming a composite material and up to a further two marks for a suitable description of its use in manufacturing. Justification required for full marks
	(b)		**Explain how the use of polymers has made complex products easier to manufacture.** Flexibility of production processes, injection moulding, 3D modelling / printing	**[3]**	Award up to three marks for a suitable description of its ease of manufacture justification required for full marks Do not accept just 'cheaper.'

Question			Answer	Mark	Guidance
6	(a)		**Describe what takes place in the following stages:** Client brief: Discussion with client regarding the function, performance of the intended product, materials to be used, intended markets, quantity, cost, timescale. Presenting design ideas: Feedback to client regarding how client's needs are to be met, any restrictions in materials and components, research carried out. (2 x 2)	**[4]**	
	(b)		**Name two benefits to a company of using CAD during the design of a product.** Answers could include: Alterations / modifications can be easily made, designs can be e-mailed to different companies, allows for remote manufacturing, ease of storage, 3D representations arte possible, can be directly linked to CAM, simulation. (2 x 1)	**[2]**	Do not accept 'quicker', 'more accurate.'
	(c)		**Describe how modern technology is used during the following stages of the manufacture of a product.** **Assembly:** Use of spread sheets for task/labour allocation, use of robots for welding operations, pick and place machines, flow soldering/ icing. **Marketing:** Use of internet for advertising / selling, lithographic printing of glossy magazines / product literature, e-mailing, social networking sites. (2 x 2)	**[4]**	Award one mark for a relevant activity and one mark for the description. Some justification required for full marks. Accept technologies/techniques appropriate to printing and food.

Question			Answer	Mark	Guidance
7			**Give three points that should be considered when choosing materials, components or ingredients for manufactured products and explain why each factor is important.** Answers could include: forms of supply, availability, suitability for process, cost, material properties, are they safe to use, recyclability, environmental issues, ease of storage, sustainability, shelf life. (3 x 3)	**[9]**	Award one mark for naming a factor and up to a further two marks for a clear explanation of its importance. Justification required for full marks

Question			Answer	Marks	Guidance	
					Content	**Levels of response**
8*			Award up to six marks for a detailed explanation and evaluation of the implications that the introduction of modern technology has had on the workforce.	**[6]**	Examples and relevant points could include: The introduction of robot technology and programmable / flexible control of the production process using say, a PLC , has resulted in fewer hazardous jobs for human workers, air conditioning / climate control has made the workforce a more pleasant environment to work in, this results in a healthier workforce, can lead to loss of jobs The above list is, of course, not exhaustive	**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. 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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