OCR
Oxford Cambridge and RSA

GCSE

Manufacturing

Unit **B232:** Manufacturing Processes

General Certificate of Secondary Education

Mark Scheme for June 2015

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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.

Annotations

Annotation	Meaning
BP	Blank Page – this annotation **must** be used on all blank pages within an answer booklet (structured or unstructured) and on each page of an additional object where there is no candidate response.

Question			Answer	Mark	Guidance
1	(a)		**Electronic and communications**: examples could include: Mobile phones, lap-top computers, computer mouse, LCD television, plasma screens, MP3 players, I pads, I pods **Packaging**: examples could include: Perfume bottles, drinks bottles, fruit drink carton, coffee jars, **Machinery and equipment**: examples could include: Electric power tools, wheelbarrows, washing machines, tumble dryers, dish washers, trolley jacks, conveyor belt, **Motor manufacturing**: examples could include: caravan bodies, car doors, car body panels, alloy wheels, pick-up trucks, off-road vehicles, **Furniture**: examples could include: Armchairs, kitchen cabinets, dining tables, dining chairs, wardrobes, computer desks (5 x1)	**[5]**	Award one mark for each correctly named product appropriate to the named sector
	(b)		**Chemical and pharmaceutical:** examples could include: Asthma medication, saccharin tablets, soaps shampoos, make-up products, petroleum jelly, **Clothing and textiles**: examples could include: Denim jeans, jackets, coats, uniforms, overalls, fashion shoes, trainers, safety clothing. **Electrical:** examples could include: Torches, electric kettles, toasters, electric fires, vacuum cleaners, floor/carpet cleaners, micro-wave ovens, alarm clocks, **Food and drink:** examples could include: Tea bags, celebration cakes, freeze dried vegetables, pizzas, pro-biotic yogurts, gluten free meals **Paper and print:** examples could include: Magazines, brochures, greetings cards, books, newspapers, wallpapers, (1 + 2 x 1)	**[3]**	Award one mark for a correct sector and one mark for each correctly named product from that sector. Sector must be from the list in the specification
2	(a)		Vacuum forming, injection moulding,	**[1]**	Process must be appropriate to the product. Do not award marks for naming pieces of equipment such as 'vacuum former,' 'blow moulding machine'

Question			Answer	Mark	Guidance
	(b)		Example: Robot arms (1)used to remove finished casing from moulding machine(1); digital scanners used to monitor process (1) (1 + 2)	**[3]**	Explanation should include reference to the technology used for one mark and a suitable description of its application for a further two marks.
	(c)		Answers could include: Checking measurements (with laser or camera systems), using weighing scales, electrical safety checks. (2 x 1)	**[2]**	Award one mark for each relevant quality control check which should be appropriate to the product being made. Must refer to QC checks made <u>during manufacture.</u>
	(d)		Answers could include: Wear appropriate P.P.E, when operating machine / handling hot components from machine; safety guards to be in position; safe working area to be provided; know location of emergency stop button; must be trained on the machine; check machine is safe to use (2 x 1)	**[2]**	
3	**(a)**		Answers may include references to: Can verify / prove(1) production process is correct (1). Check product(1) against specification (1), Provide feedback to client (1), identify possible production problems (1), Initial example of a product used for evaluation / testing (1), before going into full scale production (1), (3 x 2)	**[6]**	Award one mark only for simply worded answer such as 'measure, 'test,' 'compare' etc. Suitable explanation required for full two marks.
	(b)		Answers may include references to: savings on cost by using a cheaper material (1), avoid initial costs of expensive tooling/ setting up (1), time saving by using a faster production process (1), client may request change in design/spec (1) (3 x 1)	**[3]**	Award one mark only for simply worded answer such as : 'cheaper,' 'quicker,' etc. Suitable explanation required for the full three marks. Accept suitable example for one mark. Accept relevant repeated answers from part (a)

Question			Answer	Mark	Guidance
4	(a)		• Material supply and control • **Production planning** • Processing and production • **Assembly** • Final quality checks • **Packaging** • Despatch (4 x 1)	**[4]**	Award one mark for each correctly placed stage of manufacture
	(b)		Answers could include: **Production planning**: use of CAD, spreadsheets, internet sourcing of materials/components, use of trade journals, allocate manpower. **Assembly**: robots for welding, JIT for material supplies, pick and place machinery for printed circuit boards. (2 x 2)	**[4]**	Award one mark for the Modern Technology and one mark for a description of its use. Reference to specific Modern Technology needed for full marks
5	(a)		Answers could include some of the following: **Titanium:** replacement hip /shoulder joints, orthodontic applications, **Kevlar;** Body armour and safety clothing. **ABS**: Vehicle body parts, motor cycle helmets. **Liquid crystal**: Display screens for telephones, televisions, VDU's, **Pro-biotic:** food additive for yogurts / cakes, **Fibreglass**: high performance aircraft (gliders), boats, vehicle body panels, baths, hot tubs, water tanks, roofing, pipes, cladding, casts for broken limbs, surfboards (3 x 1)	**[3]**	Chosen material or ingredient must be named to qualify for mark Award one mark for each correct example. Product must match material
	(b)	(i)	Answers must include reference to the ability to react (1) to an external stimulus (1) e.g. change in temperature, pressure , stress , electrical signals , moisture, magnetic fields . (1+1)	**[2]**	Response must relate to a 'smart' material Award one mark for a correctly named reaction and one mark for an example of an appropriate external stimulus.

Question			Answer	Mark	Guidance
		(ii)	Answers could include: Smart grease (1)used in CD drawers (1) Smart wire (SMA) (1)used in the manufacture of spectacles (1) Thermochromic inks and dyes(1) used as a safety feature on children's mugs and cutlery (1) (1+1)	[2]	Award one mark for naming a smart material and a further one mark for a description of a typical use
6	(a)	(i)	Award one mark for relevant material / ingredient Answers could include: sheet steel for the motor vehicle industry, plywood used in the building industry, readymade puff pastry used in baking, (2 x 1)	[2]	
		(ii)	Award one mark for relevant material / ingredient Answers could include: baking flour, chocolate, dried egg, paint pigments, plastics, metals (2 x 1)	[2]	
	(b)		Answers could include; storage needs, transportation, costs, availability, suitability for different forms of manufacturing processes, (2 x 2)	[4]	Award up to two marks for suitable description of chosen factor e.g. suitability for product/process, can it be stored for prolonged periods of time, does the material/ingredient require special transport.
7		(i)	Answers could include: Higher quality materials could improve the quality of the product, need to store the materials in a suitable environment, do the materials meet the requirements of the client / specification. (3 x 1)	[3]	Response must be fully justified to gain full marks

Question			Answer	Mark	Guidance
		(ii)	Answers could include: is the process being used of a high enough level of accuracy to give a good quality finish, is the process suitable for large quantity manufacture, could it be better if it were to be hand-made. (3 x 1)	[3]	Response must be fully justified to gain full marks

Question			Answer	Marks	Guidance	
					Content	**Levels of response**
8			Award up to six marks for a detailed discussion of the benefits to the workforce of using modern technologies in manufacturing'	**[6]**	Examples and relevant points could include: The introduction of robot technology and programmable control of production has resulted in fewer hazardous jobs for human workers Modern air-conditioning / climate control has made the workplace a more pleasant environment to work in, resulting in a healthier workforce. Some workers would be re-trained to do more highly skilled / paid jobs Cleaner and safer working environment due to machines being fully enclosed Sensors are used to monitor production and automatically shut-down machines when problems occur, making workers safer	**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 (1 – 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 0 = a response not worthy of a mark.
			Total	**60**		

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