

Mark Scheme (Standardisation) Summer 2010

GCSE

GCSE Engineering & Manufacturing
(5318/04)

Section A

Question Number	Answer	Mark
1(a)	<ul style="list-style-type: none"> • Bathroom taps (1) • Metal curtain rail (1) <p><i>If three boxes ticked max marks = 1 mark. If 4 boxes or more ticked no marks.</i></p> <p>(1x1) (1x1)</p>	(2)

Question Number	Answer	Mark
1(b)	<ul style="list-style-type: none"> • Wrought iron fence (1) • Household radiator (1) <p><i>If three boxes ticked max marks = 1 mark. If 4 boxes or more ticked no marks.</i></p> <p>(1x1) (1x1)</p>	(2)

Question Number	Answer	Mark
2(a)	<ul style="list-style-type: none"> • Hex socket screw/hexagon head screw (1) • Allen head screw/allen screw (1) • socket head cap screw (1) • machine screw (1) • socket head screw (1) • set screw (1) • cap screw/cap head screw (1) <p><i>Accept any recognisable spelling (phonetic) of the answer above. Do not accept 'bolt' or 'screw' on its own</i></p> <p>(1x1)</p>	(2)
	<ul style="list-style-type: none"> • Tension spring (1) • Extension spring (1) • Return spring (1) • Spring (1) <p><i>Accept any recognisable spelling (phonetic) of the answer above. Do not accept 'compression spring'.</i></p> <p>(1x1)</p>	

Question Number	Answer	Mark
2(b)	<p>An answer that makes reference to two of the following points:</p> <ul style="list-style-type: none"> • Used in a gearbox • Rotates with another gear • To turn a shaft • To transmit rotational power • To change the direction of rotation • Used to transfer motion from one shaft to another • Rotary motion • Used to change speed of rotation • Reference to mechanical advantage <p>e.g. Used to change speed (1) and transfer rotary motion from one shaft to another (1) Used in a gearbox (1) to change the direction of rotation (1)</p> <p style="text-align: right;">(2x1)</p>	
	<p>An answer that makes reference to two of the following points:</p> <ul style="list-style-type: none"> • A fastener • Snaps into place • Can be removed • To prevent lateral movement of an object • Fits in a machined groove • Used on a dowel pin/ other part • Allows rotation of an object • To hold/fasten a shaft in position • A semi flexible metal ring <p>e.g. A fastener (1) used to prevent lateral movement of an object (1) Fits in a groove (1) used on a dowel pin (1)</p> <p style="text-align: right;">(2x1)</p>	

(4)

Question Number	Answer	Mark
3	<p><i>No mark awarded where 2 or more lines are drawn from a term. Lines do not have to be straight but term and key area must be clearly linked.</i></p> <div> <p>Term</p> <div>Copper</div> <div>Embedded computers</div> <div>Presentation software</div> <div>Tungsten</div> <div>Thermostat</div> <div>Voice over internet protocol (VoIP)</div> <p>Key Area</p> <div>Information & communications technology (ICT)</div> <div>Control technology</div> <div>Modern materials</div> </div> <p>(6x1)</p>	<p>(6)</p>

Question Number	Answer	Mark
4(a)(i)	<p>Appropriate product such as e.g.</p> <ul style="list-style-type: none"> • Mechanics Vice (1) • Wheelbarrow (1) • Cantilever Toolbox (1) • BBQ (1) • Darts (1) • Mountain Bikes (1) • Motorbikes (1) • Cars (1) • Filing Cabinets (1) <p><i>This list is not exhaustive; accept any product that contains engineering fabrication or has an association with the sector. Accept brand name of specific product.</i></p> <p style="text-align: right;">(1x1)</p>	(1)

Question Number	Answer	Mark
4(a)(ii)	<p>Appropriate explanation of what the product does, may include reference to features and function</p> <p>Examples:</p> <ul style="list-style-type: none"> • Mechanics vice - used to hold materials/components (1) safely and securely when working on them (1) • Wheelbarrow - used to transport loads (1) from one place to another easily and safely (1) • Cantilever Toolbox - to allow tools to be carried (1) safely and securely (1) • BBQ - used to cook (1) food (1) • Darts - to throw (1) at a dartboard (1) • Mountain bike - used for riding (1) across rough terrain (1) <p><i>If product given in 4(a)(i) is not from this sector but is from one of the other engineering/manufacturing sectors then allow follow through, up to one mark. No answer to 4(a)(i) no mark for 4(a)(ii)</i></p> <p style="text-align: right;">(2x1)</p>	(2)

Question Number	Answer	Mark
4(b)(i)	<ul style="list-style-type: none"> • design (1) marketing (1) production planning (1) materials - supply and control (1) processing/production (1) assembly/finishing (1) packaging/dispatch (1) <p><i>If product given in 4(a) (i) is not from this sector but is from one of the other engineering / manufacturing sectors then allow follow through.</i></p> <p><i>No answer to 4(a)(i) no marks for 4(b)(i)</i></p> <p><i>Accept a process as long as it has an inferred link to computer - integrated that is within any of the stages e.g. weighing, mixing, blending, depositing cooking, baking, cooling, creaming, enrobing, chilling, freezing, etc.; must be appropriate to the product stated in 4(a)(i)</i></p> <p style="text-align: right;">(1x1)</p>	<p style="text-align: center;">(1)</p>

Question Number	Answer	Mark
4(b)(ii)	<p>One mark for identifying advantage One mark for why</p> <p>Appropriate advantage to the manufacturer e.g. Design, marketing, production planning, materials - supply and control, processing/production, assembly/finishing, packaging/dispatch</p> <p>design</p> <ul style="list-style-type: none"> • better designs (1) - can link other information into the process (1), or best designs can be maximised by simulation (1) • faster (1) - many CAD features such as copy, array can be used (1) or if mistakes made they can be quickly rectified (1) <p>marketing</p> <ul style="list-style-type: none"> • accurate information (1) - less mistakes made in capturing data (1) • better/accessible knowledge base (1) - easy data entry/data analysed easy (1) <p>production planning</p> <ul style="list-style-type: none"> • speed (1) - faster than human application (1) <p>materials - supply and control</p> <ul style="list-style-type: none"> • buy best available materials (1) - use of internet (1) • waste control (1) - by monitoring processes and quality control of processes (1) 	

	<p>processing/production Answer could relate to the application of CAM and control technology such as:-</p> <ul style="list-style-type: none"> • energy conservation (1) - by control of energy into process (1) • waste control (1) - by monitoring processes and quality control of processes(1) • competitiveness (1) - faster rates of production/application of CAM techniques (1) • product consistency (1) - by control of processes (1) • cost control (1) - by less waste/faulty parts (1) • efficiency (1) - by less waste/faulty parts (1) • speed (1) - faster than human application (1) <p>assembly/finishing Answer could relate to the application of CAM and control technology such as:-</p> <ul style="list-style-type: none"> • energy conservation (1) - by control of energy into process (1) • waste control (1) - by monitoring processes and quality control of processes (1) • product consistency (1) - by control of processes (1) • cost control (1) - by less waste/faulty parts (1) • efficiency (1) - by less waste/faulty parts (1) • speed (1) - faster than human application (1) <p>packaging/dispatch Answer could relate to the application of CAM and control technology such as:-</p> <ul style="list-style-type: none"> • packaging consistency (1) - by control of processes (1) • cost control (1) - by less waste/faulty parts (1) • efficiency (1) - by less waste/faulty parts (1) • speed (1) - faster than human application (1) • energy conservation (1) - by control of energy into process (1) • waste control (1) - by monitoring processes and quality control of processes (1) <p><i>Low response (1) or two low responses (2) or detailed response (2)</i> <i>If the answer in part 4(b)(i) is not a manufacturing stage allow follow through up to 2 marks.</i></p> <p><i>No answer to 4(b)(i) no marks for 4(b)(ii)</i></p> <p style="text-align: right;">(1x1) (1x1)</p>	<p style="text-align: center;">(2)</p>
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Question Number	Answer	Mark
4(c)(i)	<ul style="list-style-type: none"> • polymer / plastic (1) (although plastic is not technically correct accept the term plastic) • adhesive (1) e.g. epoxy resin • coating (1) e.g. polymers • metal (1) e.g. mild steel, aluminium • polymorph (1) • composite (1) • shape memory alloy (1) • ceramic (1) • Other appropriate modern material - a material currently used for the given application <p><i>Accept 'thermoplastic' or brand name of a specific material</i></p> <p><i>If product given in 4(a)(i) is not from this sector but is from one of the other engineering/manufacturing sectors then allow follow through.</i></p> <p><i>No answer to 4(a)(i) no marks for 4(c)(i)</i></p> <p style="text-align: right;">(1x1)</p>	(1)

Question Number	Answer	Mark
4(c)(ii)	<p>One mark for identifying an improved characteristic One mark for how</p> <ul style="list-style-type: none"> • Functional characteristics - weight (1) / size (1) / protection (1) / rigidity (1) • Mechanical characteristics - strength (1) / durability (1) • Aesthetic characteristics - surface finish (1) / texture (1) / colour (1)/ appearance (1) • Reduced weight (1) - better strength to weight ratio (1) • Reduced cost (1) - quicker to manufacture / assemble (1) • Better appearance (1) - brighter (1) / attractive finish (1) • Any other appropriate functional / mechanical / aesthetic characteristic relating to the improvement (1) <p><i>If answer in part 4(a)(i) is inappropriate but the material given in 4(c)(i) is appropriate allow follow through up to 2 marks. If no answer is given in part 4(a)(i) but the answer to part 4(c)(ii) relates to the material stated in part 4(c)(i) allow follow through up to 1 mark. If no answer or incorrect answer given in part 4(c)(i) no marks awarded for 4(c)(ii)</i></p> <p style="text-align: right;">(1x1) (1x1)</p>	(2)

Question Number	Answer	Mark
5(a)(i)	<p><i>One mark per relevant example</i></p> <ul style="list-style-type: none"> • to create virtual products (1) • to produce design drawings (1) • to create 2 or 3D designs (1) • for modelling (1) • to show ideas (1) • to show new product concepts (1) • to modify existing products (1) • to animate designs (1) • to prepare an initial product specification (1) <p><i>Do not accept software names on their own; do not accept 'software' without explanation e.g. 2D design software / package; do not accept 'design' or 'designing' on its own.</i></p> <p style="text-align: right;">(1x1) (1x1)</p>	(2)

Question Number	Answer	Mark
5(a)(ii)	<p>One mark for identifying benefit One mark for how</p> <ul style="list-style-type: none"> • accurately drawn (1) entry of accurate data on sizes (co-ordinates) (1) • quicker development time (1) - through simulation (1) • easier to communicate (1) - transfer of data (1) • easy to make modifications / edit / change (1) - no paper hard copies (1) / computer data (1) • lower initial development costs (1) - concurrent design processes (1) • easy storage of data/information and retrieval (1) - interaction with databases (1) • conversion from 2D to 3D (1) for modelling (1) <p><i>Low response (1) or two low responses (1) e.g. its quicker and more accurate (1) or detailed response (2)</i></p> <p><i>Must relate to one of the examples given and to the manufacturer. If answer in part 5(a)(i) is inappropriate allow follow through up to 2 marks. If no answer given in part 5(a)(i) allow follow through up to 1 mark.</i></p> <p><i>Do not accept 'easier' without explanation</i></p> <p>(1x1) (1x1)</p>	(2)

Question Number	Answer	Mark
5(b)(i)	<p><i>One mark per relevant example</i></p> <ul style="list-style-type: none"> • Fax (1) • Mobile phone / infra -red / blue tooth (1) • Email / messaging (1) • Internet / wireless / WI-FI (1) • Video conferencing (1) • Electronic point of sale (EPOS) (1) • EDI (1) • ISDN (1) • Texting (1) • Phone (1) • Walkie Talkie (1) • Voice over internet protocol - VoIP (1) <p><i>Do not accept: TV, CAD, Radio, database, computer, laptop, spreadsheets</i></p> <p>(1x1) (1x1)</p>	(2)

Question Number	Answer	Mark
5(b)(ii)	<p>One mark for identifying benefit One mark for how</p> <ul style="list-style-type: none"> • Mobile phone - can talk to supplier when needed (1) flexibility / roaming location (1) • Email - can send or receive instructions that are accurate/can get or send written confirmation of instructions (1) immediate permanent record (1) • Internet - can order and check stock immediately/in real time (1) immediate vast access to information (1) • Video conferencing - no travel expenses / less time wasted in travelling (1) but has face to face contact (1) • Electronic point of sale (EPOS) - faster / more accurate control of stock (1) automatic reading of bar codes (1) • EDI - immediate transfer of information / no hard copies needed / less storage space (1) by use of secure on-line facilities (1) • ISDN - more data transferred in parallel (1) faster response rate with supplier through use of technology (1) • Texting - can refer back to what message was given (1) stored record of transaction (1) • Phone - can clarify and confirm without having to re-visit the discussion later (1) immediate two way conversation (1) • Walkie talkie - can clarify and confirm without having to re-visit the discussion later (1) immediate two way conversation / flexibility / roaming location / cost (1) • Fax - can refer back to what message was given (1) stored record of transaction (1) <p>Other benefits may be seen in the light of:</p> <p>Speed, accuracy, JIT, information retrieval, meets consumer demands, quicker, increased sales, reduced stock levels, reduced running costs, reduced lead times, calculation of sales, stock taking quicker/easier, storage space reduced or any other appropriate response</p> <p><i>Must relate to one of the examples given and to the manufacturer. No answer in 5(b)(i) no marks, otherwise, allow follow through to one mark. 2 low responses 1 mark only.</i></p>	<p>(2x1)</p> <p>(2)</p>

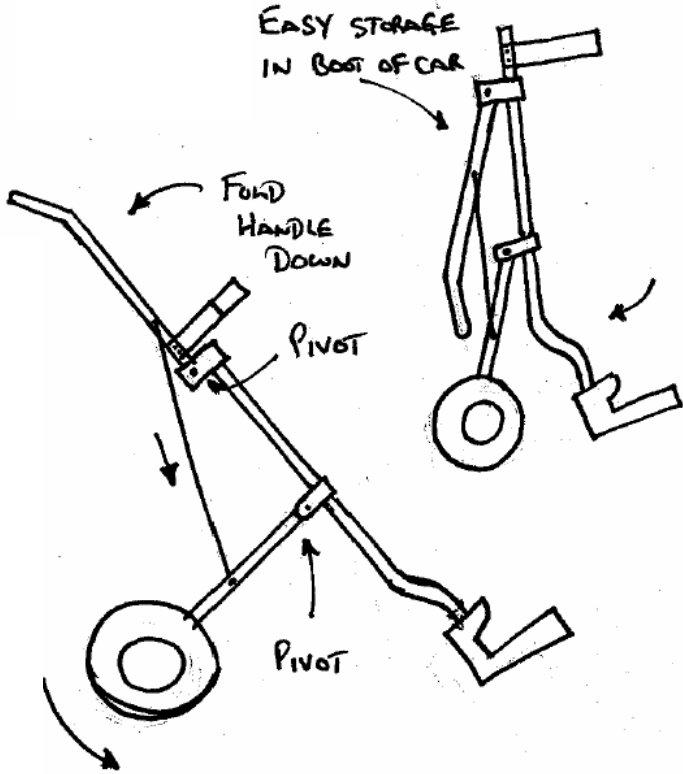
Question Number	Answer	Mark
6(a)	<ul style="list-style-type: none"> • Materials that have one or more properties that can be significantly changed in a controlled fashion(1) by external stimuli, such as stress, temperature, light, moisture, pH, electric or magnetic fields (1) • Materials that sense environmental conditions (1) and respond to them (1) • Materials that appear to 'think' (1) or have some 'memory' (1) • Or other appropriate answer <p><i>Low response (1) or two low responses (2) or up to two marks for a detailed response (2); 1 mark only for naming a smart material related to the sector, i.e. smart wire, shape memory alloys, polymers, polymorph, carbon fibre etc.</i></p> <p style="text-align: right;">(2x1)</p>	(2)

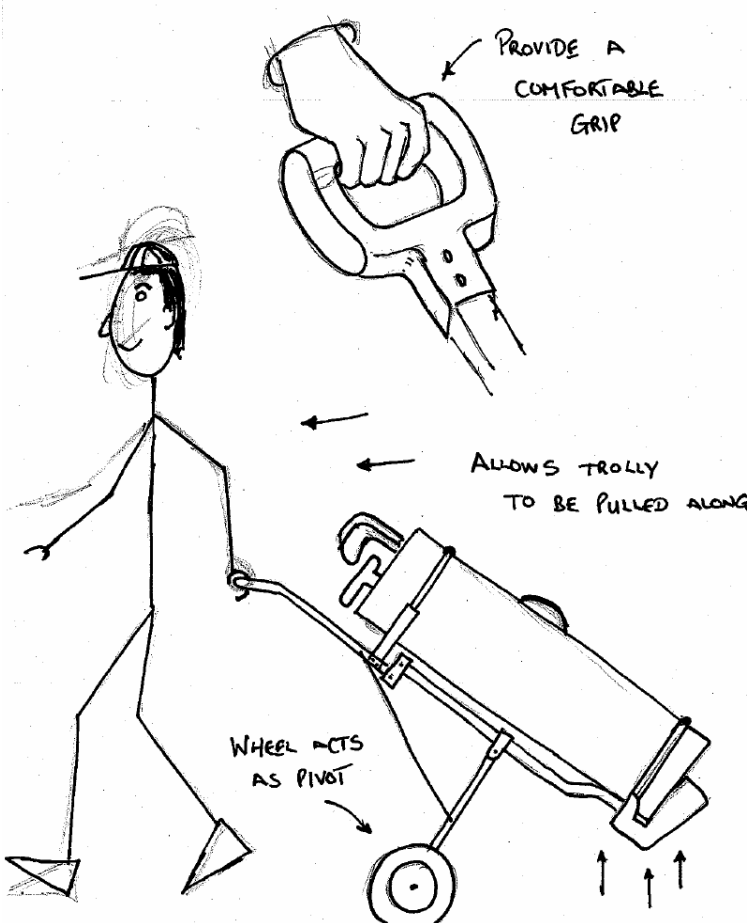
Question Number	Answer	Mark
6(b)	<p>One mark for identifying the benefit One mark for how</p> <ul style="list-style-type: none"> • reduced ordering times (1) - automatic monitoring (1) • improve quality / accuracy (1) - control of processes (1) • reduced wastage (1) - optimise production methods (1) • improved efficiency (1) - faster / quicker throughput (1) • better process control (1) - in process monitoring (1) • reduced labour (1) - automated processes (1) • lower costs (1) - reduced wastage/faster/continuous production (1) • safer processes (1) - less manual input (1) <p>Do not allow repetition</p> <p><i>Do not accept 'easier' without explanation.</i></p> <p><i>Low response (1) or two low responses (2) or detailed response (2), for each of 3 benefits</i></p> <p style="text-align: right;">(2x1) (2x1) (2x1)</p>	(6)

Question Number	Answer	Mark
7(a)	<p>One mark for each point made up to 2 marks such as:</p> <ul style="list-style-type: none"> • Guards/sensors on machinery (1) so machinery can shut down automatically (1) • Automated machinery (1) can operate in hazardous environments (1) • Less human input at the production stage (1) reduces errors (1) and results in fewer accidents (1) • Fewer problems with fatigue (1) enables continuous processing (1) • Or any other appropriate response <p><i>Low response (1) or two low responses (1) or detailed response (2)</i></p> <p style="text-align: right;">(1x1) (1x1)</p>	(2)

Question Number	Answer	Mark
7(b)	<p>One mark for each point made up to 2 marks such as:</p> <ul style="list-style-type: none"> • Accurate sales information (1) for instant feedback (1) • Detailed customer information (1) to tailor product to target market (1) • Information for marketing strategies/campaigns (1) to enable choice of correct media (1) • Information for advertising campaigns (1) and modelling sales versus demand (1) • Profit information available (1) and predicting demand for popular products (1) • Ordering to meet sales faster (1) for a just in time response (1) • Or any other appropriate response <p><i>Low response (1) or two low responses (1) or detailed response (2)</i></p> <p style="text-align: right;">(1x1) (1x1)</p>	(2)
Total marks for section A		45

Section B

Question Number	Answer	Mark
8(a)	<p>An answer that makes reference to three of the following points:</p> <ul style="list-style-type: none"> • To allow the trolley to be folded (1) • To make the product smaller to fit in the boot (1) • To fit in a vehicle (1) • Easier to transport (1) • Makes it easy to fold (1) • Reference to mechanical advantage (1) • To make the trolley compact in size (1) • Or any suitable answer <p><i>Answer must contain both notes and sketches. Max two marks if only notes or only sketches used.</i></p>  <p style="text-align: right;">(3x1)</p>	(3)

Question Number	Answer	Mark
8(b)	<p>An answer that makes reference to three of the following points:</p> <ul style="list-style-type: none"> • So the trolley can be used in an ergonomic manner (1) • To pull the trolley along comfortably (1) • To push the trolley along (1) • Used to balance the bag when moving around the golf course (1) • For a secure grip (1) • Act a comfortable grip (1) • To pivot the bag rest off the ground (1) • Or any suitable answer <p><i>Answer must contain both notes and sketches. Max two marks if only notes or only sketches used</i></p>  <p>(3x1)</p>	(3)

Question Number	Answer	Mark
9(a)(i)	<ul style="list-style-type: none"> • Production Planning (accept 'Planning' on its own; do not accept 'Production' on its own) • Materials supply and control (accept 'Materials supply' or 'Materials control' but not 'supply' or 'control' on its own) <p><i>Must be in this order.</i></p> <p style="text-align: right;">(1x1) (1x1)</p>	(2)

Question Number	Answer	Mark
9(a)(ii)	<ul style="list-style-type: none"> • Packaging and Dispatch / P and D (1) • Dispatch (1) • Stage 7 / stage seven (1) • 7 / seven (1) <p><i>Accept any recognisable spelling (phonetic) of the answers above.</i></p> <p><i>Do not accept 'packaging' on its own</i></p> <p style="text-align: right;">(1x1)</p>	(1)

Question Number	Answer	Mark
9(b)(i)	<p>Appropriate descriptions including three of the following points:</p> <p><u>Design</u></p> <ul style="list-style-type: none"> • Development of the design brief (1) • Design specification for the mass produced golf trolleys (1) • Listing design criteria (1) • Listing performance requirements (1) • Use of internet/websites to investigate existing designs (1) • Sketches are produced by hand (1) • Initial design ideas are produced (1) • Development of design ideas (1) • Modelling ideas using ICT (1) • Using CAD software (1) • Prototyping before manufacture (1) • Sourcing materials/supplies/consumables (1) • Costing resource requirements (1) • Communicating with client/customer (1) • Or similar <p><i>Example: the stage where the design brief for the mass produced golf trolley would be developed (1) and where designs would be created (1), by hand and using CAD software (1), in order to model the images prior to manufacture (1).</i></p> <p><i>Up to 3 marks</i></p> <p><i>Low response (1) or three low responses (3) or up to three marks for a detailed response (3)</i></p> <p style="text-align: right;">(3x1)</p>	<p style="text-align: center;">(3)</p>

Question Number	Answer	Mark
9(b)(ii)	<p>Appropriate descriptions including three of the following points:</p> <p><u>Production</u></p> <ul style="list-style-type: none"> • Use of available resources (1) • Materials, parts and components used (1) • Processes that are used (1) • Use of available equipment and machinery (1) • Following the production plan (1) • Carrying out inspection and quality control (1) • Complying with health and safety factors (1) • Where the parts of the trolley are manufactured (1) • The frame cut to size (1) • The frame bent to the correct shape (1) • Holes drilled in the frame (1) • Wheels/handle injection moulded (1) <p>Or similar, but must be related to the manufacture of mass produced golf trolleys.</p> <p><i>Example: The stage where the parts of the golf trolley would be manufactured (1) such as the wheels injection moulded (1). At this stage the product would also need to be checked to see that it has been made correctly (1). Up to 3 marks</i></p> <p><i>Low response (1) or three low responses (3) or up to three marks for detailed response (3)</i></p> <p style="text-align: right;">(3x1)</p>	(3)

Question Number	Answer	Mark
10(a)	<p>Specific material, other than steel, used to manufacture the frame</p> <ul style="list-style-type: none"> • Aluminium (1) • Aluminium Alloy (1) • Duralumin (1) • Titanium (1) • Reference to composite that includes a metal (e.g. Glare) (1) • Or other appropriate (1) <p><i>Do not accept generic terms, i.e. 'metal' or 'plastic'</i> <i>Do not accept any reference to steel i.e. stainless steel</i></p> <p><i>Accept any recognisable spelling (phonetic) of the answers above.</i></p> <p style="text-align: right;">(1x1)</p>	(1)

Question Number	Answer	Mark
10(b)(i)	<p>Any three of the following:</p> <ul style="list-style-type: none"> • drilling • turning • milling • grinding • boring • hardening/surface hardening • annealing/normalising • polishing/coating/painting/powder coating/plating • knurling • sawing • welding • fitting • cutting/shearing • press work/bending • gluing • riveting • Any other appropriate response <p>1 mark per response up to 3</p> <p><i>Accept any recognisable spelling (phonetic) of the answers above.</i></p> <p style="text-align: right;">(1x1) (1x1) (1x1)</p>	<p style="text-align: center;">(3)</p>

Question Number	Answer	Mark
10(b)(ii)	<p>An explanation that makes reference to three of the following points:</p> <ul style="list-style-type: none"> • quick method/fast production rate • excellent surface finish • no machining needed • any excess material can be re-used • unit costs are low for medium to high volume injection runs • highly automated process • reliable process • minimal waste • not labour intensive • can be mass produced easily • products have consistent quality • complex shape can be moulded easily • or similar <p><i>1 x 1 mark low response, or up to 3 marks for detailed response</i></p> <p style="text-align: right;">(1x1) (1x1) (1x1)</p>	(3)

Question Number	Answer	Mark
10(c)	<p>An explanation that makes reference to three of the following points:</p> <ul style="list-style-type: none"> • Aesthetics - high quality surface finishes, colours, textures etc. • Availability - lower cost, larger product range etc. • Functionality - lightweight, more compact etc. • Mechanical characteristics - increased strength, durability etc. • Environmental characteristics - recyclable, easier to disassemble etc. • Any other appropriate response <p><i>Up to 3 x 1 mark low responses or up to 3 marks for a detailed response</i></p> <p style="text-align: right;">(1x1) (1x1) (1x1)</p>	(3)

Question Number	Answer	Mark
11(a)(i)&(ii)	<p>One mark for identifying QC procedure One mark for how</p> <ul style="list-style-type: none"> • Checking physical damage (1) - by visual inspection (1) or comparison check against specification/ prototype /-first-off / template etc. (1) • Size check/s (1) - by direct measurement or gauging/templates/optical sensors (1) or checking against drawing/specification/tolerances (1) • Functional check/s (1) - testing the wheels run smoothly (1) and are secured to frame (1) golf trolley opens fully (1) or closes to become compact (1) • Positional check/s (1) - position of drilled holes (1) position of bend in linkage system (1) • Sampling procedures (1) - analysing reported data (1) • Properties testing - in system testing (1) or destructive testing of final product (1) <p><i>Must be within production stage.</i></p> <p style="text-align: right;">(2x1) (2x1)</p>	<p style="text-align: center;">(4)</p>

Question Number	Answer	Mark
11(b)(i)&(ii)	<p>One mark for identifying benefit to the manufacturer One mark for how</p> <ul style="list-style-type: none"> • Reduced customer complaints (1) - accurate products (1) • Control of costs (1) - cheaper product / more profit (1) • Avoids faulty parts being assembled (1) - early detection (1) • Increased sales (1) - consistent product / lower prices (1) • User confidence (1) - consistent product / less returns (1) • Reduced waste (1) - control of manufacturing processes (1) • Made to same quality standard (1) • Reliable product (1) - monitoring standards/testing (1) • Detection of broken machinery (1) - less damaged products (1) • Any other appropriate response <p>Do not accept repetitive responses</p> <p><i>2 x 1 marks for low responses (1) or 2 x 2 marks for detailed responses</i></p> <p><i>If no answer or inappropriate answer is given in 11(a)(i) or 11(a)(ii) allow follow through up to 1 mark for each benefit.</i></p> <p style="text-align: right;">(2x1) (2x1)</p>	<p style="text-align: center;">(4)</p>

Question Number	Answer	Mark
11(c)(i)&(ii)	<p>One mark for identifying benefit to the distributor One mark for how</p> <ul style="list-style-type: none"> • Safer product (1) - confidence in product reliability (1) • Consistent product (1) - assured that standards are being met (1) • Higher quality product (1) - easier to sell (1) • Fewer returns (1) - less time spent on documentation (1) • Less requirement to check goods inward (1) - lower costs (1) • Confidence in the manufacturer (1) - less requirement to source from several companies (1) • Improved reputation (1) - repeat purchases (1) • Increased sales (1) - increased profits (1) • Customer satisfaction (1) - greater market share (1) • Increased output/productivity (1) increased profit (1) • Any other appropriate response <p>Do not accept repetitive responses</p> <p><i>2 x 1 marks for low responses (1) or 2 x 2 marks for detailed responses</i></p> <p><i>If no answer or inappropriate answer is given in 11(a)(i) or 11(a)(ii) allow follow through up to 1 mark for each benefit.</i></p> <p style="text-align: right;">(2x1) (2x1)</p>	(4)

Question Number	Answer	Mark
12(a)(i)	<ul style="list-style-type: none"> • Smaller in size (1) • Higher level of skills / better educated less employment for unskilled (1) • Work patterns (1) • Higher pay (1) <p style="text-align: right;">(1x1)</p>	(1)

Question Number	Answer	Mark
12(a)(ii)	<ul style="list-style-type: none"> • Smaller in size - more responsibility (1) for undertaking a variety of operations (1); different skills required (1) which are less traditional (1) • Higher level of skills/better educated/less employment for unskilled - more able people required (1) with the ability to re-train often (1); ability to cope with constant change (1) and to undertake complex work (1); but less overall cost for company (1) • Work patterns - shifts often necessary (1) resulting in better paid staff (1); often working with different people (1) hence ability to communicate vital (1) <p><i>Low response (1) or two low responses (2) or up to two marks for a detailed response (2); up to 2 marks each response</i></p> <p><i>If no answer in 12(a)(i), or the answer is inappropriate allow follow through up to 1 mark each.</i></p> <p style="text-align: right;">(2x1) (2x1)</p>	(4)

Question Number	Answer	Mark
12(b)	<ul style="list-style-type: none"> • Safer (1) • Cleaner (1) • Quieter (1) • Healthier (1) • Noise pollution (1) • More space (1) • Less space (1) • More machines (1) • Less machines (1) • Any other appropriate response (1) <p style="text-align: right;">(1x1)</p>	(1)

Question Number	Answer	Mark
12(c)	<ul style="list-style-type: none"> • Increased efficiency / lower emissions (1) resulting in less consumption (1) and a reduction in the increase in global warming (1) • Improved manufacturing control (1) meaning less waste and pollution (1) • Increased productivity / less fuel used (1) hence less use of fossil fuels (1) resulting in lower consumption and emissions (1) • Technology that is less dependant on finite resources (1) and makes efficient use of finite resources (1) or can use sustainable alternatives (1) • Reduced wastage in production (1) hence less materials used in production (1) resulting in less waste thrown into landfill (1) • Ability to adapt process (1) to reduce rework/waste (1) <p><i>Low response (1) or two low responses (2) or up to two marks for a detailed response (2); up to 2 marks each response</i></p> <p style="text-align: right;">(2x1) (2x1)</p>	(4)

Question Number	Answer	Mark
13	<p>An explanation that makes reference to four of the following points.</p> <p>The following could be either positive or negative influences:</p> <ul style="list-style-type: none"> • Research and development time / costs (1) • Life cycle costs (1) • Sales / profits (1) • Long term savings (1) • Transferring technology into further new products (1) • Wider product range (1) • Risk evaluation (1) • Waste (1) • Manufacturing efficiencies (1) • Derivative products i.e. smaller, larger versions faster to develop (1) <p>Example: The application of new materials can have a high initial development cost (1) due to the time taken in researching and testing the product (1), but can result in savings in the long term (1) due to lower product costs meaning increased sales and profits (1) which could result in increased product range (1) or transference of technology into new product ranges (1). Such new ranges could result in competitive advantage (1).</p> <p><i>Low response (1) or detailed response (up to 4)</i></p>	<p>(4x1)</p> <p>(4)</p>

Question Number	Answer	Mark
14	<p>A explanation that makes reference to four of the following points to a maximum of four marks:</p> <ul style="list-style-type: none"> • Modern processes are highly automated (1) so require a lot of electricity, or other forms of energy, to operate them (1) • Modern processes are developing to replace work undertaken manually at present (1) leading to further automation (1) • Modern processes require more equipment/machinery/tooling (1) leading to higher energy consumption earlier in the supply chain (1) • Modern processes are most efficient at higher volumes (1) leading to higher production rates and therefore overall energy consumption increases (1) • Efficient modern processes may lead to a reduction in costs, meaning lower prices (1) which increases overall demand for products and leads to increased overall energy use (1) • The use of efficient modern processes may lead to economic wealth (1) which increases overall demand for products and leads to increased overall energy use (1) • The complexity of modern processes may lead to specialisation and production being concentrated in a particular area of the world (1) leading to increased energy use for transportation (1) • Or other appropriate answer (1) <p><i>Low response (1) or detailed response (up to 4)</i></p> <p style="text-align: right;">(4x1)</p>	(4)
Total Marks for section B		55
Total marks for paper		100