



GCSE

Design and Technology: Product Design

Unit **A554**: Designing Influences

General Certificate of Secondary Education

Mark Scheme for June 2015

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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.

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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			Marks	Guidance
1	(a)	<p>Attractive / appealing Bright/colourful/ multi-coloured Interesting/fun Not scary/face character /animal Features/playful/ enjoyable Play rings Interactive/nice to touch/fluffy Makes noise Varied textures/ pleasure to touch Not gender specific</p>	<p>No sharp edges/ Harmless to children No small/loose parts/ safe to put in mouth Non-flammable/ non-toxic Not come apart/no sharp points/no hard parts/rounded edges/pointy edges Fibre safety (no small fibres)</p>	<p>Lightweight/not heavy Durable/robust Washable/hygienic Colour fast Strong construction /seams Easy to hold/use Suitable size Warning labels Handle/hook Different print / textured fabrics</p>	3	<p>One word answers might be acceptable from the list on the left.</p> <p>Otherwise clarification / qualification is needed</p> <p>Do not accept (unless clarified): Safe, strong, soft (in the question), small unless qualified. Child friendly, comfortable, age appropriate, description of the toy in Fig.1 e.g. rings, animal face, handle. Vague description of features e.g. ergonomic, aesthetically pleasing, cheap, child friendly, unless qualified, aesthetic/ergonomic, secure unless qualified, not edible.</p>
	(b)	<p>Any appropriate human measurement: Width/length/thickness/circumference/height of hand/finger/mouth (1)</p> <p>Appropriate feature of the toy for body part measurement to fit (1). Hand grip/span measurement (1) for holding handles/parts of toys (1). Fingertip measurements (1) for buttons/small parts of toy (1) Mouth size (1) for choking hazards (1). Height measurements(1) for sit on/ride on toys(1) Size of fingers(1) fit size of coloured rings(1)</p>			4	<p>2 x 1 mark for anthropometric measurement 2 x 1 mark for description of toy feature</p> <p>Measurement of child hand/fingers (1), so that toy can be held properly (1) and played with.</p> <p>Only award 2nd mark if first mark gained making reference to anthropometric such as hand size/Finger size/etc.</p> <p>Do not accept: references to weight or grip strength, size of toy</p>

Question		Answer	Marks	Guidance
	(c)	<p>BSI check/test/investigate materials/not come apart/unable to swallow/choking hazard/toxic/flammable/electrical safety/sharp/meet specific requirements/finger traps/allergies to materials/chemicals/residue</p> <p>BSI approve products for sale to the public/require appropriate labelling.</p> <p>1 mark each for two of the above plus 1 for discussion</p> <p>OR</p> <p>1 mark for any one of the above plus up to 2 marks for detailed explanation/discussion.</p>	3	<p>Answers could refer to:</p> <p>BSI ensure that toys meet European safety standards. BSI set out safety tests that must be applied to ensure the toys meet the required standards to make sure that toys cannot stab, trap, mangle or choke. BSI standards restricts the use of flammable materials in toys. BSI also details the requirements for safety warnings and symbols, toys must carry the CE mark (European standards), the Lion Mark may be used to shown BS standards have been met. Toys that might be dangerous for children under three years old must state: 'Warning. Not suitable for children under 36 months', together with an indication of the specific risks, such as choking on small parts.</p> <p>Unless qualified do not accept: so they are safe, not hazardous, cause harm as these are implied in the question.</p> <p>Do not reward vague references to comfort or ease of use or intended use.</p>
		Total	10	

Question		Answer	Marks	Guidance
2	(a)	<p>Reasons include:</p> <p>Trend setting: brand awareness, greater availability, seen as fashion items, technophiles desire products with new technologies</p> <p>More choice looks modern, stylish/minimalist designs- liked by users, designs and colours</p> <p>Ease of Use: quick and easy to read the time/big display, suitable for children, lightweight/not heavy, flexible for sports use, won't break easily, digital/not analogue- easier to read, thin/small/aerodynamic/slender- less bulky than a watch, made from rubbery material – causes less irritation/more comfortable to wear/soft/flexible, easy to put on/fits all sizes/easy to wear when doing sport, no attachments to get caught</p> <p>Additional features: stopwatch/functions, waterproof/swimming/showering, recording lap times, heart rate or counting steps/pedometer.</p> <p>Cost of mass production means lower price/without expensive mechanisms of clockwork watches, cheap to replace, low cost- likely to damage during exercise so replaced at little cost, worry free: not expensive</p>	4	<p>1 mark for each point plus 1 mark for justification (x 2)</p> <p>Examples:</p> <p>Do not accept: cheap unless qualified, popular</p>
	(b)i	<p>Correct answer:</p> <p>Glow/luminous/lights-up/seen/shines/see in the dark</p>	1	<p>Do not accept: references to colour/changes, neon,</p>

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	(b)ii	<p>Thermochromic materials (pigment/sheet): colour changing products when temperature changes (mugs, kettles, baby feeding products, battery tester strips, bath mats).</p> <p>Polymorph – moulded when warm (handles, modelling).</p> <p>Photochromic materials: colour changing with light (spectacles).</p> <p>Shape Memory Alloy/SMA/Smart Wire/Nitinol – remembers shape when reaches temperature (robotics).</p> <p>Reflective inks – minute glass balls in ink embedded in fabric when printed (Reflective clothing).</p> <p>Microencapsulated materials – microscopic capsules applied to yarns/fabric (scented clothing, antiseptic capsulated products, medical dressings, antifungal sportswear</p> <p>Quantum tunnelling composite- changes electrical resistance when pressure is applied</p>	2	<p>1 mark for a named or type of Smart material, e.g. Nitinol or Shape Memory Alloy attracts the mark.</p> <p>Only award 2nd mark for example of use/product ,if correct smart material identified</p> <p>Do not accept thermoplastic, phosphorescent(in question),</p> <p>The following are acceptable smart materials, because of inclusion on BBC BITESIZE:</p> <p>Lycra®, Thinsulate® , Piezoelectric materials, Carbon fibres, Kevlar®, Chameleon and Memory foam.</p>

Question		Answer	Marks	Guidance
	(c)	<p>Answers could refer to:</p> <p>Built in obsolescence– a non replaceable parts means product will become obsolete/designed to fail, therefore leading to more waste produced</p> <p>Products with non-replaceable parts are difficult to recycle as not easily taken apart</p> <p>Environmental issues of components e.g. batteries in landfill</p> <p>User buy a complete replacement product more often</p> <p>Can be cheaper to replace a product</p> <p>Designed so that they cannot be opened for repair</p> <p>Customers looking for sustainable products will not buy</p> <p>1 mark for up to two of the above plus 1 for discussion OR 1 mark for any one of the above plus up to 2 marks for detailed explanation/discussion.</p>	3	<p>Example answers</p> <p><i>Products which break will have to be completely replaced (1), costing more money than replacing broken part (1). Materials are wasted and will have to be thrown away in landfill creating environmental damage (1).</i></p> <p><i>Once broken cannot be repaired(1) and will have to be replaced(1)</i></p> <p>Do not accept: 'bad for the environment' unless qualified, e.g. reference to landfill or not able to recycle. Parts that cannot be replaced (in the question).</p> <p>If no explanation given max. 2 marks</p>
		Total	10	

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3	(a)	<p>Flexible/squeezable/force drink out/ easy to drink from, Lightweight/less dense Shatterproof /non breakable/safety issues of materials Waterproof/water resistant, Screw top plastic lid – resealable, Easy to open/cap removed by hand Easy to hold/fits hand/comfortable Keep contents cool/insulation material Keep contents fresh Easy to grip/carry around/pack in bag Easy to pack away/flatten/easily squashed Recyclable Larger area for printing additional information for the customer, e.g. nutrition, allergy advice More child friendly (packed lunch).</p>	3	<p>Accept one word answers.</p> <p>Do not accept looks good, attractive, ergonomic, more aesthetically pleasing, cheaper, new materials (unless qualified)</p> <p>Do not accept answers of benefits to manufacturer. Do not accept references to cost or manufacturing Do not accept references to easily disposed of (how/why), hold more drink, bigger graphics</p>
	(b)	<p>Larger area for printing graphics to aid with product advertising and promotion. Can print directly onto the packaging so cuts down components & processes Can produce in a range of colours for different products/drinks Costs less to transport as more lightweight. Changes in materials means less breakage that will cost money. Can be packaged easier in boxes for shipping to the shops Production more cost effective Label does not have to be added separately, reducing the amount of parts needed.</p> <p>2 x 2</p>	4	<p>1 x mark for feature 1 x mark for clarification</p> <p>Do not accept answers:</p> <p>Benefits to the user 'cheaper' unless qualified e.g. less material needed More child friendly (packed lunch) Can be recycled Less space</p>

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3	(c)	<p>Answers should include reasons for the importance of the design of packaging:</p> <p>Appeal/first impression Stand out/look of product/first impression/draws customer in/recognise, persuade customers to buy</p> <p>Promotion – packaging is a key point in selling and advertising a product. Communicates brand image and quality. Displays the product on sale.</p> <p>Product Information – the packaging will give consumers important information before buying, such as price, ingredients/materials, products features</p> <p>Protection – ensure customer receives a quality product thus giving good impression of the brand</p> <p>Brand awareness – packaging promotes brand awareness; customers will recognise and trust brand names</p> <p>Minimal/recyclable packaging Attracting environmentally aware customers</p> <p>1 mark for up to two of the above plus 1 for discussion OR 1 mark for any one of the above plus up to 2 marks for detailed explanation/discussion.</p>	3	<p>Marketing is <u>communicating</u> the value of a product, service or brand to <u>customers</u>, for the purpose of promoting or selling that product, service, or brand.</p> <p>A feature of the design of packaging (1) Relationship to marketing (1)+(1) OR Two features of the design of packaging (1)+(1) Relation to marketing (1)</p> <p>This identifies the company from another (1); customers may be loyal to this brand (1) and buy other products by the same company (1).</p> <p>Ingredients are listed(1), important for people with specific special requirements(1)</p> <p>If no explanation given max. 2 marks</p>
		Total	10	

Question			Answer	Marks	Guidance	
					Content	Levels of response
4	(a)		<p>Reasons why trend setter has been influential could include:</p> <p>Robin Day Robin Day was a post-war modernism designer. Throughout a seven-decade career he aimed to bring contemporary design to a mass market at an affordable price.</p> <p>He had little time for the increasing role of fashion and remained convinced that good design could improve quality of life. Robin's success brought him to the attention of a British manufacturer, Hille, which had specialised in period furniture, but was eager to modernise. Seizing this opportunity, he designed a series of simple, functional chairs, tables, desks and storage units that harnessed the latest wood and metal-working techniques. Many of his designs were low-cost, such as the beech-framed 1950 Hillestak chair with its moulded plywood seat. Whereas pre-war furniture was solid and ponderous, his designs were pared down and seemed to float above the ground. Robin Day's inventive response to technology reflected the positive, forward-looking mood of the early post-war era. His sparing use of materials and economical approach to construction, using the minimum number</p>	6	<p>Many answers continue onto additional sheets or at the bottom of 4(b) – examiners must check and use linking tool.</p> <p>Continuous prose – question marked for quality of written communication of a reasoned argument</p> <p>Only <u>one</u> Trend Setter must be referred to.</p> <p>If the answer relates only to the Iconic product then award Level 1</p> <p>There is no credit for mention of the Trendsetter by name or the name of the Iconic Product, as these are given in the question.</p> <p>List/sequence of discrete words maximum of 2 marks If bullet points are used with full sentences treat as continuous text.</p> <p>Typical connectives that may be used to link points of discussion: so that, because, therefore, however, although, but, consequently, alternatively, whenever, besides, moreover, since, whereas, despite.</p>	<p>Level 1 (0 to 2 marks) Some understanding of the influence of the Trend Setter <i>Little or no use of specialist terms. Answers ambiguous or disorganized. Errors of grammar, punctuation and spelling.</i> Limited range of points made with some relation to the Trendsetter and with limited justification</p> <p>Level 2 (3 to 4 marks) Reasonable understanding of the influence of the Trend Setter. <i>Some use of specialist terms, not always used appropriately. Information presented for most part in a structured format. Occasional errors in grammar, punctuation and spelling.</i> Range of points adequately made with some relationship to the Trendsetter, with explanations and some justification</p> <p>Level 3 (5 to 6 marks) Detailed understanding of the influence of the Trend Setter. <i>Specialist terms used appropriately and correctly. Information presented in structured format. Accurate use of grammar, punctuation and spelling with some minor errors.</i> Range of well made points that mostly relate to the Trendsetter and with reasoned explanations through discussion and justification</p>

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			<p>of components, stemmed from the enforced austerity of the war years, when materials and labour were in short supply. These habits became deeply ingrained in his design psyche. From the outset Robin Day was a deeply moral and highly principled designer, who was not interested in making a design statement, but in solving practical problems in the most rigorous, efficient and cost-effective way. "A good design must fulfil its purpose well, be soundly constructed, and should express in its design this purpose and construction," he stated in 1962.</p> <p>After the sale of Hille, Robin Day specialised in public seating for sports stadia and auditoria such as the 1984 RD seating for NHS waiting rooms and the 1990-91 Toro and Woodro project for the London Underground.</p>		<p>Candidate's response should answer the question '<i>Explain why this trend setter has been so influential</i>' rather than be a celebrity biography of the subject.</p>	

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			<p><u>Luella Bartley</u> Luella Bartley is a British fashion designer. She launched the Luella designer label in 1999. Luella Bartley started to study fashion at St Martins College of Art and Design. However, she found the "wonderful and wacky" people there a little intimidating and transferred to the fashion journalism course. She started a three month work placement with the Evening Standard in London, and was still working there four years later, after being persuaded not to return to her degree course. After working as a fashion editor at British Vogue for about two years, she started her own fashion range "Luella", even though her experience was in fashion journalism and she had not completed her design training. Her first collection was called "Daddy, I Want a Pony" and was a great success. Since launching her label in 1999, Luella Bartley delivered a consistently different take on English attire. Her look embodied the British 'It' girl, with punk and frilly accents, pearls adorning layered party dresses, and tastefully cropped jackets. A year after her first showcase, she was awarded Britain's Young Designer of the Year award. Her designs often drew influence from the British music scene</p>			

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			<p>and have been acclaimed for her quirky, punk inspired, often distinctly English style. Her London Fashion Week(LFW) debut in February 2000 was titled "Daddy, who were the Clash?". In 2001 Luella signed a design deal with New Look in order for her designs to access 'a different end of the market'. In 2002, the "Gisele" bag she designed from the bestselling "Luella for Mulberry" edition was an instant success and revived the ailing Mulberry brand. This, in turn led to Club21, a Singapore-based retail group, investing in a global licensing agreement for Luella Bartley ready-to-wear and accessories. In January 2006, Bartley was selected to launch Target's Go International line. She has showcased her work several times during LFW. She returned to LFW for Spring/Summer 2007, after six and a half years based in New York and previously Milan fashion weeks. During the same week she opened her first store, on London's Brook Street. In 2008 the British Fashion Council named Luella 'Designer of the Year', having been nominated previously for two consecutive years. Following on from this award, Luella was dubbed 'International Designer of the Year' by Elle Sweden in January 2009.</p>			

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			<p>On the 10 November 2009, it was reported that Luella had ceased trading due to the withdrawal of her financial backer.</p> <p>Luella Bartley was appointed Member of the Order of the British Empire (MBE) in the 2010 New Year Honours.</p> <p>She has been appointed as design director of Marc by Marc Jacobs from 2013.</p>			

Question			Answer	Marks	Guidance	
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			<p><u>Otl Aicher</u> Also known as Otto Aicher. He was born 13th May 1922 in Ulm, Germany. He was one of the leading graphic designers of the 20th Century as well as an educator and author. He was renowned for his structural visual systems and typography.</p> <p>During the 2nd World War he was connected to the White Rose resistance movement which opposed Nazi Germany and was arrested for refusing to join the Hitler Youth.</p> <p>In 1948 he started his own design studio in his hometown of Ulm, Buro. Aicher, then help found the Ulm School of Design (Hochschule für Gestaltung Ulm) along with Inge Scholl and Max Bill. This became one of Germany's leading educational centres for design. During this pioneering development he and his students were involved in some of his most iconic visual identities, most notably Braun and Lufthansa. Aicher was heavily involved in corporate branding.</p> <p>In the early 70's he lead the team that designed arguably his most famous and acclaimed work, the 1972 Munich Olympics. The pictogram system that was developed has become the standard</p>			

Question			Answer	Marks	Guidance	
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			<p>for signage throughout the world. They also created the first official Olympic Mascot, a multi-coloured dachshund, Waldi.</p> <p>In 1988 he developed the Rotis typeface family, naming it after the domicile in the city of Leutkirch im Allgau, where he kept his studio. He lived here until he was tragically killed in a traffic accident whilst mowing his lawn on 1st September 1991.</p>			

Question			Answer	Marks	Guidance	
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			<p><u>The Microprocessor</u></p> <p>A microprocessor incorporates the functions of a computer's central processing unit (CPU) on a single integrated circuit (IC) or at most a few integrated circuits. It is a multipurpose, programmable device that accepts digital data as input, processes it according to instructions stored in its memory, and provides results as output. It is an example of sequential digital logic, as it has internal memory. Microprocessors operate on numbers and symbols represented in the binary numeral system.</p> <p>The advent of low-cost computers on integrated circuits has transformed modern society. General-purpose microprocessors in personal computers are used for computation, text editing, multimedia display, and communication over the Internet.</p> <p>Microprocessors are essential parts of embedded systems, providing digital control over a wide range of objects from appliances to automobiles to cellular phones and industrial process control. During the 1960s, computer processors were constructed out of small and medium-scale ICs - each containing from tens to a few hundred transistors. These were placed and soldered onto printed</p>			

Question			Answer	Marks	Guidance	
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			<p>circuit boards, and often multiple boards were interconnected in a chassis. The integration of a whole CPU onto a single chip or on a few chips greatly reduced the cost of processing power. The integrated circuit processor was produced in large numbers by highly automated processes, so unit cost was low. Single-chip processors increase reliability as there are many fewer electrical connections to fail. As microprocessor designs get faster, the cost of manufacturing a chip (with smaller components built on a semiconductor chip the same size) generally stays the same.</p> <p>The first microprocessors emerged in the early 1970s and were used for electronic calculators, using binary-coded decimal (BCD) arithmetic on 4-bit words. Other embedded uses of 4-bit and 8-bit microprocessors, such as terminals, printers, various kinds of automation etc., followed soon after. Affordable 8-bit microprocessors with 16-bit addressing also led to the first general-purpose microcomputers from the mid-1970s.</p> <p>Thousands of items that were traditionally not computer-related now incorporate microprocessors. These include large and small household</p>			

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			<p>appliances, cars, car keys, tools, toys, light switches and audio/visual components. Most consumer products require powerful, low-cost, microprocessors.</p> <p>A microprocessor control program (embedded software) can be easily tailored to different needs of a product line, allowing upgrades in performance with minimal redesign of the product.</p> <p>Microprocessor control of a system can provide control strategies that would be impractical to implement using electromechanical controls or purpose-built electronic controls.</p>			

Question			Answer	Marks	Guidance	
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			<p><u>Canned Food Products</u></p> <p>Throughout history, people have attempted to keep perishable foods fresh. Until the early 19th century, the only options were pickling, salting, drying or smoking these provisions. These methods preserved the food but they affected its taste, texture and nutritional value.</p> <p>Canning is a method of preserving food in which the food contents are processed and sealed in an airtight container. Canning provides a typical shelf life ranging from one to five years, although under specific circumstances a freeze-dried canned product, such as canned, dried lentils, can last as long as 30 years in an edible state.</p> <p>In 1795 the French military offered a cash prize of 12,000 francs for a new method to preserve food. Nicolas Appert suggested canning and the process was first proven in 1806 in tests conducted by the French navy who awarded the prize in 1809 or 1810.</p> <p>Nicolas Appert perfected a revolutionary bottling technique. Appert found that by enclosing provisions within a sealed bottle and boiling it, the food would keep indefinitely. Within several months of the initial publication of his findings, others began using Appert's process with tin cans instead of bottles.</p> <p>Canned goods didn't really take off until</p>			

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			<p>the 1860s. Civil War soldiers in the United States relied on canned goods whilst fighting, and they returned home talking of their taste and value. This led to increased demand.</p> <p>The railroad industry began using canned goods to transport local meats and vegetables across the country. By the 1870s, the United States dominated the canning industry and was exporting vast quantities of salmon and other foods around the world.</p> <p>The Canning Process</p> <p>Despite the two centuries that have passed since the advent of canned food, not much has changed from Appert's original technique. Because most bacteria can't survive in extreme heat, once the food inside sealed cans reaches a certain temperature, the bacteria dies, and an enclosed, sterile environment is created.</p> <p>World War I</p> <p>Demand for canned food increased during World War I, as military commanders sought vast quantities of cheap, high-calorie food to feed their millions of soldiers, which could be transported safely, survive trench conditions, and not spoil in transport. Throughout the war, soldiers generally subsisted on low-quality canned foodstuffs, such as the British "Bully Beef" (cheap corned beef), pork and</p>			

Question			Answer	Marks	Guidance	
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			beans and Maconochies Irish Stew, but by 1916 widespread boredom with cheap canned food amongst soldiers resulted in militaries purchasing better-quality food to improve morale, and the complete meals in a can began to appear. In 1917 the French Army began issuing canned French cuisine, such as coq au vin, while the Italian Army experimented with canned ravioli and spaghetti bolognese. After the war, companies that had supplied military canned food improved the quality of their goods for civilian sale.			

Question		Answer	Marks	Guidance
4	(b)	<p><u>Reasons why the product chosen has been influential:</u></p> <p><u>Robin Day – Polypropylene Stacking Chair</u> 1963 - Robin Day designed the Polypropylene chair for Hille, which becomes one of the best-selling chairs of all time. It is so iconic, it was selected as one of eight designs in a 2009 series of British stamps of "British Design Classics." One of the very few chairs that after over 50 years is still in production and has been used around the world, for schools, hospitals, airports, canteens, restaurants, arenas, hotels, as well as homes. It is the best-selling chair in the world. From 1963 to the present day over 50 million chairs have been sold.</p> <p>One of the first pieces of furniture to use the mass-manufacturing opportunities that Injection Moulding created. A single injection mould can produce 4000 seat shells per week.</p> <p>The injection moulded polypropylene seat is fixed on an enamelled bent tubular steel base.</p> <p>Inspired by the Eameses "Plastic Shell" Day developed the low cost, stackable, single-form seat. The one-piece seat and back is injection moulded from polypropylene, a lightweight thermoplastic with a high impact resistance. Polypropylene is inexpensive, durable, lightweight, and easy to clean.</p> <p>Habitat reissued the Polypropylene chair in new colours in 1999 which brought it to the attention of new consumers.</p>	4	<p>Content of answer refers to creditable points about the influence of the Iconic Product. These may be discrete points referring to different aspects of the Iconic Product, or they may be linked points that discuss, explain, exemplify, qualify or describe one aspect of the impact or influence.</p> <p>Answers must relate to what (1) was so different about the Iconic Product and or why (1) the Iconic Product has been so influential.</p> <p>Answer should focus on why the product has been influential and not be a description of what it is.</p> <p>Quality of written communication is not assessed in this part of Question 4.</p> <p>This can be a different Iconic Product to that of the Trendsetter chosen in part (a).</p> <p>There is no credit for mention of the Trendsetter by name or the name of the Iconic Product, as these are given in the question.</p> <p>Some answers may provide more than two creditable points for each or either reason. Credit the points wherever they are presented.</p>

Question	Answer	Marks	Guidance
	<p><u>Giselle Bag</u> Luella Bartley claims that her designs are primarily influenced by England and everything quintessentially English, including the equestrian and music scenes. She likes to make big bags and sometimes has to reduce the size of them as she has been advised that they are too big for normal handbags. She describes the Gisele as being a large, classic bag, but with a twist, with all the rings and buckles. The strapping is very equestrian in nature. The bag has two short handles and is either hand held or tucked over one shoulder. Originally launched in tan leather and with equestrian-style leather straps and a cute heart charm. The bag has been developed with two-tone shades in a range of pastel colours.</p> <p><u>Pictograms – 1972 Olympics</u> One of the cultural mile-stones in the field of visual communication, the design of the pictogram signage for the 1972 Olympic Games was so successful that it articulated to multi-lingual and mutli-cultural audiences which had never been done so well before.</p> <p>The pictogram system which was devised by Aicher and his team for the games was the perfect example of simplistic information design and has now become the universal standard.</p> <p>Basing his work in part on iconography for the '64 Games, Aicher created a set of pictograms meant to provide a visual interpretation of the sport they featured so that athletes and visitors to the Olympic village and stadium could find their way around. He created pictograms using a series of grid systems and</p>		

Question	Answer	Marks	Guidance
	<p>a specific bright colour palette that he chose for these Games.</p> <p>These designs were directly influential on the DOT pictograms, developed in 1974 by the United States Department of Transportation, which applied the same principles to standard public signage such as those for toilets and telephones; the DOT pictograms have in turn been used around the world.</p> <p>The colours chosen for the designs of the games were selected to reflect the tones of the Alps. The mountains in blue and white would make up the palette of colours which also included green, orange and silver.</p> <p>The colours were used to identify allocated themes such as media, technical services, celebrity hospitality and public functions and each had a different colour so visitors could differentiate the themes around the stadium and village. Uniforms were colour-coordinated to represent these themes, the Olympic staff could be identified as working for a particular department by the colour they were wearing.</p> <p><u>Intel 4004 4-bit central processing unit</u></p> <p>The 4004 was the first commercially available computer processor designed and manufactured by chip maker Intel, which had previously made semiconductor memory chips. The chief designers of the chip were Federico Faggin and Ted Hoff of Intel, and Masatoshi Shima of Busicom.</p> <p>The first public mention of 4004 was an advertisement in the November 15, 1971 edition of Electronic News. The 4004 was packaged in a 16-pin ceramic dual in-line</p>		

Question	Answer	Marks	Guidance
	<p>package.</p> <p>The 4004 was used in the Busicom 141-PF calculator with printer. Busicom had designed their own special purpose LSI chipset for use in their Busicom 141-PF calculator with integrated printer and commissioned Intel to develop it for production. However, Intel determined it was too complex and would use non-standard packaging and so it was proposed that a new design be developed with standard 16-pin DIP packaging and a reduced instruction set. This resulted in the 4004.</p> <p>The 4004 was part of a family of chips, including ROM, DRAM and serial to parallel shift register chips. The 4004 was built of approximately 2,300 transistors and was followed the next year by the first ever 8-bit microprocessor, the 3,500 transistor 8008 (and the 4040, a revised 4004). It was not until the development of the 40-pin 8080 in 1974 that the address and data buses would be separated, giving faster and simpler access to memory.</p> <p>These processor chips formed the basis of the first home computers which were based around the 8080 processor and the Zilog Z80 processor. In addition, several early arcade video games were built around the 8080 microprocessor. Space Invaders was perhaps the most popular such title. The 8080 was also used in Automated Fare Collection Systems that were custom designed for mass transit systems as well as other automation applications.</p> <p>The Intel 4004 was designed by physically cutting sheets of Rubylith into thin strips to lay out the circuits to be printed, a process made obsolete by current computer graphic design capabilities.</p>		

Question	Answer	Marks	Guidance
	<p><u>SPAM</u></p> <p>Spam is a canned precooked meat product made by the first introduced in 1937. The product has become part of many jokes and urban legends about mystery meat, which has made it part of pop culture and folklore. Through a Monty Python sketch, in which Spam is portrayed as ubiquitous and inescapable, its name has come to be given to electronic spam, especially spam email.</p> <p>SPAM Chopped Pork & Ham was born out of a meat crisis. Not too little meat. Too much! The Hormel Food Company of Minnesota created pork products and they had an excess of pork shoulder. President Jay Hormel hit on an idea. He ground pork shoulder with ham and cooked it in the can to create a long life meat product. SPAM first made its way onto people's plates in the US on July 5th 1937.</p> <p>SPAM spawned many imitations. Spam actually compared favourably to most of these competitor products. The pork shoulder in Hormel's Spam high quality when compared to the lips, tongue, and pig snouts competitors put in the ones they came out with following Hormel's success, although consumers couldn't tell the difference by their appearance.</p> <p>During World War 2 fresh meat was difficult to get to the soldiers on the front. Tinned meat products gave an ideal solution as they did not need refrigeration and were easy to transport. Spam was often served for breakfast, lunch, and dinner. Soldiers commonly referred to SPAM as "Special Army Meat" due to its introduction during the war. Surpluses of SPAM from the soldiers' supplies made their way into native diets. Consequently, Spam is a unique part of the history and effects of U.S. influence in the Pacific.</p>		

Question			Answer	Marks	Guidance
			<p>The residents of the state of Hawaii consume the most SPAM per capita in the United States. Hawaiian Burger King restaurants began serving SPAM in 2007 to compete with the local McDonald's chains that also serve SPAM.</p> <p>SPAM Chopped Pork & Ham became synonymous with the best of British when it arrived in 1941 during World War II. Until then corned beef had been the main canned meat product. It was widely used during the war years – meat pies were often made with spam.</p> <p>Spam remained popular in the 1950's and survived the introduction of refrigeration which reduced the need for canned meat products. In the 1960's SPAM fritters became a popular school dinner dish. In 2007, the seven billionth can of SPAM was sold.</p> <p>SPAM is a cheap alternative to fresh meat, has a long shelf life and is ready prepared. It can be used in a variety of dishes and requires little preparation.</p>		

Question		Answer	Marks	Guidance
5	(a)	<p>Specification</p> <p>Incomplete, naïve or repeated from the question (1)</p> <p>Vague/generic specification that gives limited design requirements (2)</p> <p>Adequate specification that gives two specific design requirements (3)</p> <p>Detailed specification gives three or four specific design requirements (4)</p>	4	<p><u>Generic design specification points could include:</u></p> <p>Must be safe to use Must look good Must have bright colours Must be ergonomic for the user Must be durable and long lasting</p> <p>“It must be colourful” VAGUE</p> <p>“It must use a range of bright colours” ADEQUATE</p> <p>“It must use bright colours such as orange and turquoise” DETAILED</p> <p>58</p>

Question		Answer	Marks	Guidance
	(b)	<p>Initial ideas</p> <p>Only one sketched solution with no accompanying notes (1)</p> <p>One sketched solution with notes OR Two or more solutions with no notes (2)</p> <p>Two or more sketched solutions with notes (3)</p> <p>A range of different ideas that address at least two specification points (4)</p> <p>A wide range of different ideas that fully address the specification points (5)</p> <p>A creative approach to designing (6)</p>	6	<p>When awarding marks for addressing the specification points marks can be awarded in (b) and (c) irrespective of the quality of the candidates specification points.</p> <p>A note about notes and labels: One word labels can identify and name, features on a sketch: e.g. base, aluminium, pattern, seam.</p> <p>Two and three word labels can qualify the feature: e.g. stainless steel tube, stable base.</p> <p>Notes are complete statements that can explain, justify, exemplify and quantify the feature: e.g. black polyester with white rayon stitching.</p> <p>Dimensions on a drawing and weights or quantities of ingredients come under the heading of notes.</p> <p>Different ideas refers to:</p> <ol style="list-style-type: none"> 1. whole solutions or parts of a solution. 2. conceptually different thinking. 3. not just variations on a theme. <p>Addressing specification points:</p> <ol style="list-style-type: none"> 1. may be explicitly evidenced in the notes. 2. implicitly evidenced in the idea. 3. the two specification points need to be evidenced only once each, in any of the notes or the ideas. <p>Creative approach to designing is judged in the context of an examination situation with strictly limited time. Do the ideas impress you enough for just ten minutes work from a 15 year old?</p>

Question		Answer	Marks	Guidance
	(c)	<p>Development of ideas – <u>must</u> reflect the product focus</p> <p>(0-2 Marks) Presents limited improvements/developments of ideas with little if any consideration of materials/construction/sizes. Developed idea does not fully address the design need.</p> <p>(3-4 Marks) Presents some improvements/developments of ideas with some consideration of materials/construction/sizes. Developed idea addresses some requirements of the design need.</p> <p>(5-6 Marks) Presents detailed improvements/developments of ideas with thorough consideration of materials/construction/sizes. Developed idea fully meets the requirements of the design need.</p>	6	<p>In this part candidates must address the requirements of the “<i>design need in the situation</i>”.</p> <p>If both requirements of the design need are not met the maximum available is 3 marks.</p> <p>To obtain full marks candidates must consider their own specification.</p>

Question		Answer	Marks	Guidance
	(d)	<p>(1 Mark) Presents a limited evaluation of their design against their specification at a superficial level.</p> <p>(2-3 Marks) Presents a reasonable evaluation of their design against their specification. Most specification points addressed.</p> <p>(4 Marks) Presents a detailed evaluation of their design against the specification. Fully addresses all specification points.</p>	4	Accept justified points related to the candidates' own specification, even if not rewarded in 5(a), and/or any points given to the candidates in the design need of the actual question.

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