Mark Scheme (Results)
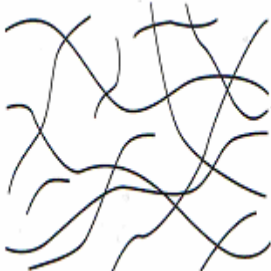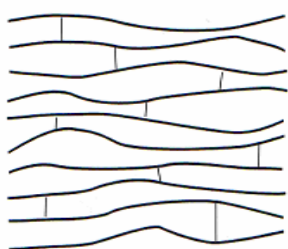
Summer 2007
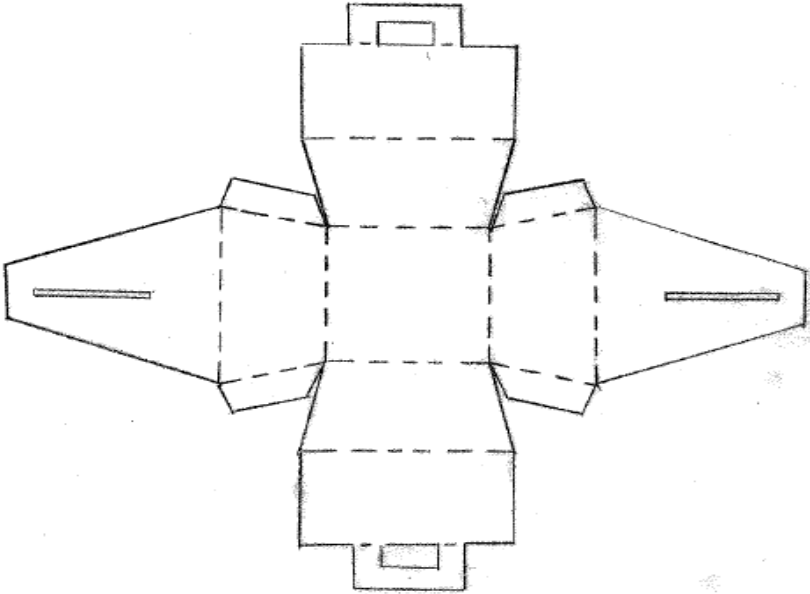
GCE Design & Technology (6146/01)

Product Design: Graphics with Materials Technology (6146/01)					
Question number			Question / Expected answers		Mark allocation
6146_01_Q01ai			State what the arrowed triangle shown in Figure 1 indicates		
1	(a)	i	Candidates may give an answer that makes reference to: • Identify that the material can be recycled (1)	1x1	(1)
6146_01_Q01aii			State which polymer is indicated by the number 3 within the arrowed triangle in Figure 1.		
1	(a)	ii	Candidates may give an answer that makes reference to: • Polyvinyl Chloride (1) • PVC (1) Only answers.	1x1	(1)
6146_01_Q01bi			Polymers can be either thermo or thermosetting depending on how the molecules of the polymer are held together. In the spaces provided below, sketch the polymer chain associated with each group.		
1	(b)	i	Candidates may give a sketch that makes reference to: _Thermo drawing. Look for random lines joined by some lines crossing or cutting across each other, almost a scribble but lines must cross._ (1) _Thermosetting drawing._ _There should be lines, which can be straight or wavy joined by short lines._ _(Like a brick wall)_ (1) Thermo Thermosetting _One mark per correct drawing._ (1)	1x1 1x1	(1) (1)

Question number			Question / Expected answers	Mark allocation	
6146_01_Q01bii			State the term used to describe how the thermo polymer chains are held together.		
1	(b)	ii	Candidates may give an answer that makes reference to: • Van der Waals Bonding (1) Only answers.	1x1	(1)
6146_01_Q01biii			State the term used to describe how the thermosetting polymer chains are held together.		
1	(b)	iii	Candidates may give an answer that makes reference to: • Covalent bonding (1) Only answers.	1x1	(1)
6146_01_Q01biv			State three ways in which the polymer chain structure of thermoplastics influence how a thermoplastic can be formed.		
1	(b)	iv	Candidates may give any THREE ways from: • Limited cross linking between lines of polymer chains (1) • Polymer chains held together by mutual attraction (Van der Waals forces) (1) • Weak structure (1) • Allows for reshaping (1) • Heat weakens structure / softens / allows movement / change in structure (1)	3x1	(3)
					(Total 9 marks)

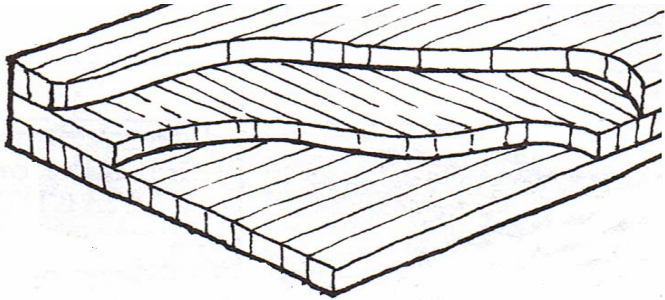| Question number			Question / Expected answers	Mark allocation	
6146_01_Q02a			Sketch the net (development) of the cardboard box in Figure 2. Your sketch should clearly show fold/crease lines, cut lines and fixing flaps.		
2	(a)		Candidates may give a sketch that makes reference to: • square base (1) • four tapered sides in good proportion off the square base (1) • evidence of slots and handles (1) • flaps (min 2 lines shown for mark) (1) • fold lines correctly shown, ie broken lines. (min 4 lines shown for mark) (1) • cut lines shown on 4 tabs ie full lines (min 2 lines shown for mark) (1)	6x1	(6)

6146_01_Q02b			Explain one reason why computer graphics would be used to design the cardboard box.		
2	(b)		Candidates may give an explanation that makes reference to: *Explanation of ONE reason which must be justified. Not 2 separate points* • Design process can be speeded up / Easy to make changes / testing / modifications (1) without having to start all over again (1) • Allows for transmission of ideas to other areas (1) electronically/digitally (1) • It can be cheaper /cost effective (1) by reducing designer costs (1) • It can be faster /quicker (1) by allowing transmission straight to manufacturing / printing output (1) • Allows for design to be transmitted / digitised (1) to be sent straight to manufacturing / printing output (1) • Produces high quality (1) and consistent / accurate measured drawings (1) • Models allow products to be rotated(1) & can be viewed (3D) from a wide range of angles (1) • Electronic storage (1) for easy retrieval (1)	2x1	(2)

Question number			Question / Expected answers	Mark allocation	
6146_01_Q02c			Explain TWO ways in which Computer Integrated Manufacture (CIM) will make the production of the cardboard box more efficient.		
2	(c)		Candidates may give any TWO explanations from the following: *Look for a statement that shows some development. A list or simple statement such as* **CIM is the integration of CAD/CAM** *is* **not** *sufficient.* *The following sample acceptable answers give an indication of the depth required for a mark.* • Easily available administration / management data (1) allows for constant monitoring of manufacturing capacity / costs to generate management level reports / maximize efficiency (1) • Developments include automated accounting (1) to generate data for tasks like cost allocation / resource planning / making it easier to prioritize jobs (1) • Known as "over the wall" process planning where a product team is organized (1) so that all specializations within a large company are represented / Multidisciplinary teams share their expertise from the start of a product (1) • CIM is a system of manufacturing using computers to integrate the process of production / business / manufacturing information (1) to create more efficient production (1) • By using CIM system design errors / manufacturing problems will be avoided (1) because of the involvement of all specialism from the outset / accuracy of measurements (1) • Processes linked together by a central computer system allows for automatically updating any changes (1) so saving time / eliminating production errors / saving money (1) • Produces less wastage (1) through lay planning / tessellations (1)	2x1 2x1	(4)
				(Total 12 marks)	

Question number			Question / Expected answers	Mark allocation	
6146_01_Q03a			Give three reasons why carton-board is an appropriate material for the mass produced printer cartridge box.		
3	(a)		Candidates may give any THREE reasons from the following: • Lightweight (1) • A suitable material for high speed printing. (1) • It is relatively inexpensive compared to …….../(suitable alternative must be stated). (1) • It is a good surface to print on (1) • The material can be recycled / biodegradable / environmentally friendly (1) • Can be die-cut and creased to required net / cut folded using die-cutting or guillotine (1) • Is adequately durable / strong enough for intended purpose / protects contents (1) • Readily available (but must be justified) (1) • Relatively inexpensive when bought in bulk (1) • Can be easily bonded together / glued (1) • Surface finish can be enhanced / laminating / varnishing (1) *Do not accept terms that are not substantiated ie* **cheap** *or* **suitable material** *but* **cheaper than using foil lined card is ok.**	3x1	(3)
6146_01_Q03bi			Outline three main processing stages in the mass production of the printer cartridge box after printing. Do not address preparation, quality checks, safety issues or assembly in you response.		
3	(b)	(i)	Candidates may give **any THREE stage** from the following: • Machine score crease lines (1) • Cut out net using die cutter / guillotine (*Die cutter/ guillotine must be stated.*) (1) • Adhesive applied to flaps by machine (1) • Fold into shape by machine (1) • Application of surface finish (1) *Do not accept stamping out or CAM*	3x1	(3)

			Outline TWO main assembly stages of the printer cartridge box. Do not address preparation, quality checks or safety issues in your response.		
6146_01_Q03bii					
3	(b)	(ii)	Candidates may give **any TWO stages from the following:** • Fold into shape by machine (only if not awarded in b(i) above (1) • Insert cartridge (1) • Glue net together (1)	2x1	(2)

Question number	Question / Expected answers	Mark allocation
6146_01_Q03c	Describe TWO of the following methods of quality control that could be used during the final colour printing of the box. Colour bars / Registration marks / Crop marks / Greyscale	

3	(c)		Candidates may give any TWO descriptions from the following: **Colour density/colour bars** • Proofs are matched to the ink density on the printing press (1) • Ink density is then measured by a colour reflection densitometer (1) • Ensures there is no variation throughout the print run (1) **Registration marks** • Used on overlays of artwork etc (1) • When they are superimposed, the colours / pictures line up (1) • There is no blurring (1) **Crop marks** • Allows for accurate cropping (1) • Cutting to size (1) • Printed outside net (1) • Guide lines for cutting / die cutting (1) **Grey scales / tonal scale** • A tonal scale printed from no colour to black (1) • Checks the consistency in colour and photographic processing (1)	2x1 2x1	(4)

(Total 12 marks)

Question number			Question / Expected answers	Mark allocation	
6146_01_Q04ai			State two reasons for laminating materials.		
4	(a)	(i)	Candidates may give any TWO reasons from the following: • To reduce costs (1) • Conserve resources (1) • To strengthen the material (1) • To improve the appearance / aesthetic properties (1) • To provide a suitable worktop / work surface (1) • To protect / waterproof / weatherproof (1) • To improve mechanical properties (1)	2x1	(2)
6146_01_Q04aii			Plywood is a laminated material. Use notes and/or annotated sketched to show the construction of plywood.		
4	(a)	(ii)	An annotated sketch that makes reference to: • Uneven number of layers (1) • Veneers / thin strips of wood used (1) • Grains in each layer at 90 degrees to previous layer (1) • layers of wood glued together (1) *(any three of the above for 1 mark each)* 	3x1	(3)

Question number			Question / Expected answers	Mark allocation	
6146_01_Q04b			Describe TWO of the mechanical properties listed below. Hardness / Toughness / Ductility		
4	(b)		Candidates may give any TWO descriptions (one for each property) from the following: Hardness – NB Resist wear • Ability to resist wear (1) by abrasion / scratching / indentation (1) • Ability to resist cutting (1) by tools (1) • Ability to resist being permanently deformed / plastic deformation / bent / broken or have its shape changed (1) when a load is applied (1) Toughness – NB Sudden impact • Ability to resist sudden impact (1) before fracture / breaking (1) • Ability to resist shock loading (1) before fracture / breaking (1) • Ability to deform plastically (1) before fracture / breaking (1) • Ability absorb energy (1) before fracture / breaking (1) Ductility – NB Stretching • Ability to deform through bending / twisting / stretching (1) in response to stress / loads (1) • Ability to deform permanently (1) in response to stress / loads (1) • A material that yields under shear stress (1) rather than a brittle fracture (1) A malleable material *(on its own is worth 1 mark)* Ability to be "drawn" extruded (1) *NB: Do not confuse Hardness and toughness*	2x1 2x1	(4)
				(Total 9 marks)	

Question number			Question / Expected answers	Mark allocation	
6146_01_Q05a			Explain why acrylic is being used for the new backboard instead of wood.		
5	(a)		Candidates may give an explanation that makes reference to: • Smooth surface (1) so that it is easier to apply vinyl lettering / range of colours (1) • Self finishing / brighter colouring (1) so it does not need to be painted (1) • Self finishing (1) so less maintenance required (1) • Weatherproof / hard wearing / durable / decay resistant / does not need to be painted (1) so there less maintenance (1)	2x1	(2)
6146_01_Q05b			Explain TWO advantages that a sign produced using vinyl sticker's has an over a traditional hand painted sign.		
5	(b)		Candidates may give any TWO explanations from the following: • Quicker to produce (1) because it is cut out on a computer and then fixed in place on location rather than painted on location (1) • Cheaper to produce (1) because less skilled workforce needed to install sign (1) • Easier to erect (1) as sign already spaced out so sign just needs to be attached to fascia / not marked out (1) • Easier to make alterations / design on a computer (1) because done on computer accurate alterations can be seen immediately (1) • More accurate (1) computer makes sign cutting very accurate / does not rely on the accuracy of the sign writing marking out the lettering (1) • Easier to repeat (1) as it is stored on computer can be readily copied (1)	2x1 2x1	(4)

6146_01_Q05ci			Describe ONE quality control method the sign manufacturer will use.		
5	(c)	(i)	Candidates may give a description that makes reference to the following: Quality control *The practical means of achieving quality assurance* • Checking the product at critical points during manufacture (1) to ensure product meets specification (1) • Checking product is within tolerance (1) by measuring / visual checks (1) • No faults with the chosen material / quality of cutting the vinyl (1) by making visual checks (1)	2x1	(2)
6146_01_Q05cii			Describe one quality assurance method the sign manufacturer will use.		
5	(c)	(ii)	Candidates may give a description that makes reference to the following: Quality assurance *How the company ensures customer expectations are met* • Checking every stage (1) from design through to completed production (materials and components etc) (1) • Ensure final product meets to customer requirements (1) by checking against the specification / meeting budget / aesthetics / durability (1) • Setting the standards in the specification (1) and making sure the standards are met (BSI, ISO, CE) (1)	2x1	(2)
					(Total 10 marks)

Question number			Question / Expected answers		Mark allocation	
6146_01_Q06a			Explain the relationship between ergonomics and anthropometrics.			
6	(a)		Candidates may give an explanation that makes reference to: • Ergonomic design requires anthropometric data / sizes (1) to produce products that will fit humans / ease of use / comfortable to use (1) *e.g Ergonomics is how user friendly a product is or how it is used. Anthropometrics is all the information about how it will be used using human measurements*		2x1	(2)
6146_01_Q06b			Explain the term '95th percentile'.			
6	(b)		Candidates may give an explanation that makes reference to: • Accounts for the majority / 95% of the TARGET population (1) and excludes 5% of the TARGET population (1) • To account for 100% of the population would require far too great a range of sizes / too costly (1) it would be very difficult to accommodate 100% of the population (1)		2x1	(2)

			Describe THREE specific ergonomic factors the designer must consider when designing the interior of a new car with specific relationship to the driver only.		
6146_01_Q06c					
6	(c)		Candidates may give any THREE descriptions from the following: *The headings are general candidates may refer to adjustable seating several discussing totally different aspects and get a mark BUT marking will be 1 mark for adjustable, 1 mark for each different example* **Adjustable seating** • To allow for a range of driver sizes (1) means that a large range of drivers can reach all the pedals and instruments (1) **Simplification of instrumentation** • Easier to understand for the driver (1) which also means less distraction for driver and allows for better concentration (1) **Comfort of seat** • If the seat is not comfortable for the driver (1) it is harder for the driver to concentrate on driving (1) **Position of instrumentation** • The driver must be able to see the instruments clearly(1) so that the driver can clearly see the cars speed and any other relevant information (1) **Position of switches** • The position of the switches must be within easy reach and in a logical layout (1) so that the driver does not get confused when using them and so cuts down on losing concentration / sizes of switches (1) **Steering wheel** • Adjustable (1) allows for up and down movement • size of steering wheel (1) suitable for different hand sizes (1) • grip (1) allowing for textured finish (1) **Vision** • Mirrors adjustable (1) to allow different sized people to see clearly (1) **Headroom** • Sufficient headroom (1) for comfortable driving (1)	2x1 2x1 2x1	(6)
					(Total 10 marks)

Question number			Question / Expected answers	Mark allocation	
6146_01_Q07			Explain TWO advantages of using a Just In Time (JIT) system in the production process.		
7	(a)		Candidates may give any TWO explanations from the following: **Strength** • Only take delivery of materials / components immediately before they are needed (1) so reduced storage area needed / larger space available for production (1) • Reducing stock piles in factories (1) so improves factory housekeeping / Reduces stock holding costs (1) • Uses standard components (1) demands higher quality control levels to reduce waste and production failures(1) • JIT is based on elimination of waste in manufacture (1) by providing the environment to perfect / simplify processes /from overproduction /processing waste / waste from product defects • Ready just in time for the next stage of production (1) to allow for continuous production / time efficiency (1)	2x1 2x1	(4)

6146_01_Q07			Explain THREE disadvantages of manufacturing a product using mass production techniques.		
7	(b)		Candidates may give any THREE explanations from the following: Disadvantage • Large number of people need to be employed (1) because of the type of manufacture / the breakdown of operations into very small units (1) • Can be very expensive to set up (1) because of the highly automated production line often requiring expensive machinery (1) • Limited flexibility in the system (1) because of the cost of setting up the production line manufacturers will want to let it run as long as possible (1) • Can be expensive to the company if the line breaks down (1) because of having to pay employers whilst no production takes place / a lack of output can lead to contractual penalties (1) • Low job satisfaction (1) work morale low (1) • Less skilled workers are required (1) leading to job instability (1)	2x1 2x1 2x1	(6)
				(Total 10 marks)	

Question number			Question / Expected answers	Mark allocation	
6146_01_Q08			Choose **ONE** of the following design movements and describe four key features that define that movement. The Arts and Crafts movement / Art Nouveau / Bauhaus / Art Deco / Memphis		
8			*Only one of the four design houses asked but four key features needed from that movement.* *Award marks on the basis of one for identified feature and a further mark for a development of the feature.* <u>**The arts and crafts movement**</u> • Basic philosophy that revolved around the love of simple things (1) • Revolted against the mass-produced / over decorated, / product of the Victorian age (1) • Went for well-crafted / well-designed consumer goods. Aesthetically simple designs' practical and of everyday relevance (1) • It was a reformist movement that influenced British and American architecture, decorative arts, cabinet making, crafts, even "cottage" garden designs (1) • In the United States, the terms Arts and Crafts movement, American Craftsman, or Craftsman style are often used to denote the style of architecture, interior design, and decorative arts that prevailed between the dominant eras of Art Nouveau and Art Deco, or roughly the period from 1910 to 1925 (1) • The Movement began primarily as a search for authentic and meaningful styles for the 19th century and as a reaction to the eclectic revival of historic styles of the Victorian era and to "soulless" machine-made production aided by the Industrial Revolution (1) • They considered the machine to be the root cause of all repetitive and mundane evils, some of the protagonists of this movement turned entirely away from the use of machines and towards handcraft, which tended to concentrate their productions in the hands of sensitive but well-heeled patrons (1)		

Question number	Question / Expected answers	Mark allocation
8	*Only one of the four design houses asked but four key features needed from that movement.* *Award marks on the basis of one for identified feature and a further mark for a development of the feature.* • The movement was in large part a reaction to industrialization, but it was neither anti-industrial nor anti-modern. Some of the European factions believed that machines were in fact necessary, but they should only be used to relieve the tedium of mundane, repetitive tasks (1) • Those who sought compromise between the efficiency of the machine and the skill of the craftsman thought it a useful endeavour to seek the means through which a true craftsman could master a machine to do his bidding, in opposition to the reality which was much more prevalent during the Industrial Age; humans had become slaves to the industrial machine (1) • Muthesius was a champion of standardization. He believed in mass production, in affordable democratic art. Van de Velde saw mass production as threat to creativity and individuality (1)	

Question number	Question / Expected answers	Mark allocation
8	*Only one of the four design houses asked but four key features needed from that movement.* *Award marks on the basis of one for identified feature and a further mark for a development of the feature.* **The arts and crafts movement (cont)** • Though the spontaneous personality of the designer became more central than the historical "style" of a design, certain tendencies stood out: reformist neo-gothic influences, rustic and "cottagey" surfaces, repeating designs, vertical and elongated forms (1) • To express the beauty inherent in craft, some products were deliberately left slightly unfinished, resulting in a certain rustic and robust effect (1) • Another primary aim was for craftspeople to derive satisfaction from what they did. This satisfaction, the proponents of this movement felt, was totally denied in the industrialised processes inherent in compartmentalised machine production (1) • The proponents of the Arts and Crafts movement were against the principle of a division of labour, which in some cases could be independent of the presence or absence of machines. They were in favour of the idea of the master craftsman, creating all the parts of an item of furniture, for instance (1) • The Arts and Crafts movement sought to reunite what had been ripped asunder in the nature of human work, having the designer work with his hands at every step of creation (1) • The decline of rural handicrafts, corresponding to the rise of industrialised society, was a cause for concern for many designers and social reformers, who feared the loss of traditional skills and creativity (1) • Morris and other socialist designers such as Crane and Ashbee looked forward to a future society of free craftspeople (1)	

Question number	Question / Expected answers	Mark allocation
8	*Only one of the four design houses asked but four key features needed from that movement.* *Award marks on the basis of one for identified feature and a further mark for a development of the feature.* • When craftsmen, consumers, and manufacturers realized the aesthetic and technical potential of the applied arts, the process of design reform in Boston started (1) • The Society of Arts and Crafts was formed in America in 1897, with a mandate to "develop and encourage higher standards in the handicrafts." The 21 founders were interested in more than sales, and focused on the relationship of designers within the commercial world, encouraging artists to produce work with the highest quality of workmanship and design (1) • This Society was incorporated for the purpose of promoting artistic work in all branches of handicraft (1) • It hoped to bring Designers and Workmen into mutually helpful relations, and to encourage workmen to execute designs of their own and endeavoured to stimulate in workmen an appreciation of the dignity and value of good design; to counteract the popular impatience of Law and Form, and the desire for over-ornamentation and specious originality (1)	

Question number	Question / Expected answers	Mark allocation
8	*Only one of the four design houses asked but four key features needed from that movement.* *Award marks on the basis of one for identified feature and a further mark for a development of the feature.* <u>**The arts and crafts movement (cont)**</u> • It insisted upon the necessity of sobriety and restraint, or ordered arrangement, of due regard for the relation between the form of an object and its use, and of harmony and fitness in the decoration put upon it (1) • In the United States, the Arts and Crafts Movement took on a distinctively more bourgeois flavour. Americans tried to establish a new source of virtue to replace heroic craft production: the tasteful middle-class home. They thought that the simple but refined aesthetics of Arts and Crafts decorative arts would ennoble the new experience of industrial consumerism, making individuals more rational and society more harmonious (1) • The American Arts and Crafts Movement was the aesthetic counterpart of its contemporary political movement: Progressivism. While the European movement tried to recreate the virtuous world of craft labour that was being destroyed by industrialization (1) • These included the "Craftsman"-style architecture, furniture, and other decorative arts such as the designs promoted by Gustav Stickley in his magazine (1)	

Question number			Question / Expected answers	Mark allocation	
8			*Only one of the four design houses asked but four key features needed from that movement.* *Award marks on the basis of one for identified feature and a further mark for a development of the feature.* **Art Nouveau** • Art Nouveau made use of many technological innovations of the late 19th century, especially the broad use of exposed iron and large, irregularly shaped pieces of glass in architecture (1) • By the start of the First World War, the highly stylised nature of Art Nouveau design which itself was expensive to produce began to be dropped in favour of more streamlined, rectilinear modernism that was cheaper and thought to be more faithful to the rough, plain, industrial aesthetic that became Art Deco (1) • Dynamic, undulating, and flowing, with curved 'whiplash' lines of syncopated rhythm, characterise much of Art Nouveau. Another feature is the use of hyperbolas and parabolas. Conventional mouldings seem to spring to life and 'grow' into plant-derived forms (1) • As an art movement it has affinities with the Pre-Raphaelites and the Symbolism (arts) movement, Art Nouveau has a distinctive visual look; and unlike the backward-looking Pre-Raphaelites (1) • Art Nouveau artists quickly used new materials, machined surfaces, and abstraction in the service of pure design (1)		

Question number	Question / Expected answers	Mark allocation
8	*Only one of the four design houses asked but four key features needed from that movement.* *Award marks on the basis of one for identified feature and a further mark for a development of the feature.* **Art Nouveau** • Though Art Nouveau designers selected and 'modernised' some of the more abstract elements of Rococo style, such as flame and shell textures, they also advocated the use of highly stylized organic forms as a source of inspiration, expanding the 'natural' repertoire to embrace seaweed, grasses and insects (1) • Art Nouveau did not negate the machine as the Arts and Crafts Movement did, but used it to its advantage. (1) • For sculpture, the principal materials employed were glass and wrought iron, leading to sculptural qualities even in architecture. Glass making was an area in which the style found tremendous expression Art Nouveau is considered a 'total' style, meaning that it encompasses a hierarchy of scales in design (1) • Jewellery of the Art Nouveau period revitalised the jeweller's art, with nature as the principal source of inspiration, complemented by new levels of virtuosity in enamelling and the introduction of new materials, such as opals and semi-precious stones (1) • The widespread interest in Japanese art, and the more specialised enthusiasm for Japanese metalworking skills, fostered new themes and approaches to ornament (1)	

Question number	Question / Expected answers	Mark allocation
8	*Only one of the four design houses asked but four key features needed from that movement.* *Award marks on the basis of one for identified feature and a further mark for a development of the feature.* Art Nouveau (cont) • With Art Nouveau, a different type of jewellery emerged, motivated by the artist-designer rather than the jeweller as setter of precious stones (1) • The jewellers were keen to establish the new style in a noble tradition, and for this they looked back to the Renaissance, with its jewels of sculpted and enamelled gold, and its acceptance of jewellers as artists rather than craftsmen (1) • In most of the enamelled work of the period precious stones receded. Diamonds were usually given subsidiary roles, used alongside less familiar materials such as moulded glass, horn and ivory (1)	

Question number	Question / Expected answers	Mark allocation
8	*Only one of the four design houses asked but four key features needed from that movement.* *Award marks on the basis of one for identified feature and a further mark for a development of the feature.* <u>Bauhaus</u> • Produced very modernistic designs that integrated art, technology and craftsmanship (1) • Designs were suitable for mass production techniques and used a system of standardised parts (1) • Economical to build and cheap to manufacture in large quantities (1) • Readily acceptance of new materials that were becoming available (1) • One of the main objectives of the Bauhaus was to unify art, craft, and technology (1) • In the first decade of the new century however, the movement was receiving criticism; impelled partly by moral yearnings for a sterner and more unadorned style and in part by rationalist ideas requiring practical justification for formal effects. Nonetheless, the movement had opened up a language of abstraction which was to have a profound importance (1) • during the 20th century (1) • Adolf Loos was the most effective critic, publishing Ornament and Crime in 1908 which argued that the urge to decorate surfaces was primitive. His work was feted by the later modern movement and acted as a catalyst for the abandonment of surface decoration (1)	

Question Number				Question / Expected answers	Mark allocation	
8				*Only one of the four design houses asked but four key features needed from that movement.* *Award marks on the basis of one for identified feature and a further mark for a development of the feature.* • The work of Peter Behrens for the German company AEG tried to bridge the widening gap between art and mass production. He created clean-lined designs for the company's graphics, industrial design and factories which did not rely on surface decoration, but made full use of newly developed materials such as poured concrete and exposed steel (1) • A number of artists began to develop their own creative languages which relied increasingly on abstraction (1) • The Bauhaus aimed to teach the arts and crafts in tandem and to bridge the widening gulf between the art and industry (1) • Bauhaus school was founded by Gropius in the city of Weimar in 1919 to create a new guild of craftsmen, without the class distinctions which raise an arrogant barrier between craftsmen and artist (1) • Gropius wanted to create a new architectural style to reflect this new era. His style in architecture and consumer goods was to be functional, cheap, and consistent with mass production. He wanted to reunite art and craft to arrive at high-end functional products with artistic pretensions (1)		

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8	*Only one of the four design houses asked but four key features needed from that movement.* *Award marks on the basis of one for identified feature and a further mark for a development of the feature.* Bauhaus (cont) • German reform in art education was critical for economic reasons. Since the country lacked the quantity of raw materials that the United States and Great Britain had, they had to rely on the proficiency of its skilled labour force and ability to export innovative and high quality goods (1) • The school's philosophy basically stated that the artist should be trained to work with the industry. It was too experimental for American tastes the school floundered and closed in 1938 (1) • The paradox of the early Bauhaus was that, although its manifesto proclaimed that the ultimate aim of all creative activity was building, the school wouldn't offer classes in architecture until 1927 (1) • The single most profitable tangible product of the Bauhaus was its wallpaper (1) • In the two years under the outspoken Swiss Communist architect Hannes Meyer, the architectural focus shifted away from aesthetics and towards functionality (1) • Meyer's approach was to research users' needs and scientifically develop the design solution as opposed to Gropius' "study of essentials", and Meyer's research into user requirements, Mies advocated a "spatial implementation of intellectual decisions" (1) • The Harvard Graduate School of Design was enormously influential in the late 1940s and early 1950s. There was no teaching of history in the school because everything was supposed to be designed and created according to first principles rather than by following precedent (1) • The machine was considered a positive element, and therefore industrial and product design were important components (1) • One of the most important contributions of the Bauhaus is in the field of modern furniture design. The world famous and ubiquitous Cantilever chair by Dutch designer Mart Stam, using the tensile properties of steel (1)	

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8			*Only one of the four design houses asked but four key features needed from that movement.* *Award marks on the basis of one for identified feature and a further mark for a development of the feature.* Art Deco **Bright and bold primary colours used. (1)** **They used exotic woods and luxury materials. (1)** This movement was an amalgamation of many different styles and movements of the early 20th century, including Constructionism, Cubism, Modernism, Bauhaus, Art Nouveau, and Futurism. (1) These design influences were expressed in fractionated, crystalline, faceted forms (1) Art Deco was purely decorative. This style was seen as elegant, functional, ultra modern. (1) The initial movement was called Style Moderne. (1) It was widely considered to be an eclectic form of elegant and stylish modernism, being influenced by a variety of sources. Among them were the "primitive" arts of Africa, Egypt, or Aztec Mexico, as well as Machine Age or Streamline technology such as modern aviation, electric lighting, the radio, and the skyscraper. (1)		

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8			*Only one of the four design houses asked but four key features needed from that movement.* *Award marks on the basis of one for identified feature and a further mark for a development of the feature.* • Art Deco is characterized by use of materials such as aluminium, stainless steel, glass lacquer, inlaid wood, sharkskin, and zebra skin. The bold use of stepped forms, symmetry and sweeping curves repetition, modified by Asian influences such as the use of silks and Middle Eastern designs unlike the sinuous, natural curves of the Art Nouveau), chevron patterns, and the sunburst motif are typical of Art Deco (1) • Art Deco was an opulent style, and its lavishness is attributed to reaction to the forced austerity imposed by World War I (1) • Its rich festive character fitted it for "modern" contexts, including interiors of cinema theaters and ocean liners such as the *Ile de France* and *Normandie* (1) • The attractive shapes resulting from scientifically applied aerodynamic principles were enthusiastically adopted within Art Deco, applying streamlining techniques to other useful objects in everyday life, such as the automobile and even for mundane and static objects such as pencil sharpeners and refrigerators (1) • These 'streamlined' forms began to be used Strong, dynamic lines; bright colours; and fast, modern landscapes can be commonly seen in painting, lithographs, and posters from this design period (1)		

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8			*Only one of the four design houses asked but four key features needed from that movement.* *Award marks on the basis of one for identified feature and a further mark for a development of the feature.* Art Deco (cont) • Art Deco slowly lost patronage in the West after reaching mass production, when it began to be derided as gaudy and presenting a false image of luxury. The style was cut short by the austerities of World War II (1) • A resurgence of interest in Art Deco came with graphic design in the 1980s, to its use in ads for jewelry and fashion (1) • Art Deco is used popularly in video game graphic design. The computer game Sim City 4 makes heavy use of Art Deco buildings (1)		

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8			*Only one of the four design houses asked but four key features needed from that movement.* *Award marks on the basis of one for identified feature and a further mark for a development of the feature.* **Memphis** • Disagreed with a conformist approach of the time (1) • Challenged the idea that products had to follow conventional shapes, colours, textures and patterns. Used bright coloured plastic laminates and imitation marble for this purpose. The group specifically chose this material because of its obvious "lack of culture". The work has been described as vibrant, eccentric and ornamental (1) • The designers were interested in mass production (1) • The Memphis group comprised of Italian designers and architects who created a series of highly influential products in the 1980's. They disagreed with the conformist approach at the time and challenged the idea that products had to follow conventional shapes, colours, textures and patterns. The Memphis group was founded in 1981 (1) • Memphis was a reaction against the slick, black humourless design of the 1970's. It was a time of minimalism with such products as typewriters, buildings, cameras, cars and furniture all seeming to lack personality and individualism. In contrast, the Memphis Group offered bright, colourful, shocking pieces. The colours they used contrasted the dark blacks and browns of European furniture (1) • The word tasteful is not normally associated with products generated by the Memphis Group but they were certainly ground breaking at the time (1) • The main aim was to reinvigorate the Radical Design movement. The group intended to develop a new creative approach to design and drew inspiration from Art Deco and Pop Art. Their concepts were in stark contrast to so called 'Good Design' (1)		

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8			*Only one of the four design houses asked but four key features needed from that movement.* *Award marks on the basis of one for identified feature and a further mark for a development of the feature.* • The group approached furniture and ceramic companies commissioning them to batch produce their design concepts (1) • The group may no longer exist but it has certainly influenced graphic design, restaurant design, fabrics and furnishing (1) • There was no set formula. "No-one mentioned forms, colours, styles, decorations," observed Radice (1) • After decades of modernist doctrine, Sottsass and his collaborators longed to be liberated from the tyranny of smart, but soulless 'good taste' in design (1) • Their solution was to continue the experiments with unconventional materials, historic forms, kitsch motifs and gaudy colours begun by Studio Alchymia, the radical late 1970s Italian design group to which Sottsass and De Lucchi had belonged. They discovered furniture made from the flashily coloured plastic laminates emblazoned with kitsch geometric and leopard-skin patterns usually found in 1950s comic books or cheap cafés (1)		

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8			*Only one of the four design houses asked but four key features needed from that movement.* *Award marks on the basis of one for identified feature and a further mark for a development of the feature.* **Memphis (cont)** • "Memphis is not new, Memphis is everywhere. Little about Memphis was truly innovative. It was an exuberant two-fingered salute to the design establishment after years in which colour and decoration had been taboo (1) • Memphis also scoffed at the notion that 'good' design had to last. "It is no coincidence that the people who work for Memphis don't pursue a metaphysic aesthetic idea or an absolute of any kind, much less eternity," observed Sottsass. "Today everything one does is consumed. It is dedicated to life, not to eternity. He always insisted on moving forward rather than reliving past glories (1) • Within the design world, Memphis was a watershed. Memphis was also a colourful, clearly defined manifestation of the often obscure post-modernist theories then so influential in art and architecture (1)		
				(Total 8 marks)	
				TOTAL FOR PAPER: 80 MARKS	