Version 2 (20.06.12)

General Certificate of Education (A-level)
June 2012

Design and Technology: Product Design (Textiles) TEXT3

(Specification 2560)

Unit 3: Design and Manufacture

Final

Mark Scheme

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Question	Marking Guidance	Marks
01	**Woollen products** include merino wool, lambswool, worsted suiting cloth, spun woollen yarn for knitted products, woven woollen cloth. **Applications** include: Tailored clothing and suits, dresses, coats, Knitted sweaters and separates, accessories, household textiles including blankets, carpets, drapes and furnishing cloth, industrial felts and fire protection clothing. Naturally occurring **colours** include cream, brown, black, silver grey. Wool fibres have a surface of overlapping **scales**. These scales can hook onto each other, enabling the surface of the cloth to be **felted** easily when exposed to heat, moisture and damp conditions and mechanical action. Felting can be seen as an advantage for aesthetics, to create a felted look for garments and accessories. Also as a negative when felting has taken place but is not required, and the tendency to **shrink** due to scales overlapping. Wool has a natural **crimp,** which enables air to be trapped and therefore gives wool excellent **insulating** properties. This natural crimp also enables woollen fabrics to retain or return to their original **shape**. Crimp in wool fibres also improves the tensile **strength** of woollen products. Wool does have a naturally occurring coating of **lanolin;** this is usually removed while being processed. Sometimes it is retained for its water repellent properties, for example in Aran knitting wool. The exterior of the wool fibre is **hydrophobic** and tends to repel water, but the interior of the fibre absorbs water. Wool can absorb up to 30% of its bulk weight in moisture vapour without feeling wet. Wool has low electrostatic charge due to the retention of moisture. Wool has very good **extensibility** which is greater when wet than dry. It takes a **long time to dry**. Wool has natural **flame resistant** properties and will not ignite unless exposed to high temperatures. Wool products tend to be **durable** and long-lasting. Wool affords natural **UV protection**. The **Woolmark** is an indication of quality. **Aftercare** includes machine washable on the correct setting for wool, hand wash or dry clean, knitted products should be dried flat, medium to cool iron. **Low mark range** Limited and simplistic explanation of the properties that consumers will gain from pure new wool products with limited reference to woollen products, some inaccuracies in explanation given. Points will be generalised; there may be relevant qualities without explanation of how they relate to the structure of the wool fibre. Sentences may not always be well connected. There will be a number of errors of grammar, punctuation and spelling. **Mid mark range** A more thorough explanation of the properties that consumers will gain from pure new wool products and a range of woollen products are included within the explanation given. Some accurate information but there is a lack of specific detail. Response reflects some reasonable understanding with an attempt to explain how the qualities relate to the structure of the wool fibre. Sentences are reasonably well connected. There may be a small number of errors of spelling, grammar and punctuation	0– 4 marks **5 - 8 marks**

01 cont	**High mark range** An in-depth answer, detailed and accurate explanation of the many properties that consumers will gain from pure new wool products with a wide range of woollen products included within the explanation given. The response illustrates a very good understanding of the qualities of the wool fibre and how they relate to its structure. An in-depth answer, detailed and accurate information. Sentences and paragraphs follow on from one another smoothly and logically. There are few, if any errors of grammar, punctuation and spelling.	**9-12 marks**

02	Other luxury hair fibres include: **Cashmere** - the most expensive of the luxury hair fibres, fabrics made from cashmere are very soft, lightweight and weight for weight are warmer than wool. **Mohair** – long hair fibres, lightly curled, have a silky lustre, takes dye well, does not felt easily. **Angora** – fine very light hair fibres, good moisture absorbing properties, the coarse guard hairs create a spiked effect in outerwear. **Camel hair** – Very fine, soft, lightly crimped, beige in colour. Used in outerwear, Coarser haired cloth is used for interlinings. **Alpaca**, Llama, Vicuna and Guanaco – They are all from species of Llama, and produce fine fibres, soft in appearance but are hard wearing and strong, lightly crimped and have very good thermal properties creating warm fabrics used in jackets, overcoats, knitted fabrics and blankets. The **source and rarity** of the fibre may make it luxurious. These fibres are often **delicate** which adds to the luxury appeal. 2 Named fibres, **1 mark each** **Description of qualities**: **Low mark range** Limited and simplistic explanation of the selected fibres with little reference to the attributes that they bring to products made from them. Products may be named but may not be appropriate. Some inaccuracies in explanations given. **Mid mark range** A more detailed explanation of the selected fibres with some reference to the attributes that they bring to products made from them. Some accurate and appropriate reference to products. Some accurate information but there is a lack of detail. **High mark range** An in-depth answer, detailed and accurate explanation of the two luxury hair fibres with a very good understanding of the attributes that they bring to products made from them given. Good examples of suitable products.	2 marks 0 – 1 mark 2 – 3 marks 4 marks

03	New developments include: **Improved washabiity**. The Woolmark organisation have developed 'Easy Care' which is dedicated to expanding the production of 'Easy Care' garments to meet requirements for consumer demand and lifestyle through developments in Machine Washable and Total Easy Care wool, wool blend products and easy care home care products. Improved protection from degradation by the **moth**. Sportwool.com Launched the revolutionary new fabric technology **Sportwool™** with its unique vapour management and micro-climate control, focusing on the performance advantages offered by Sportwool™. Australian Merino wool is the world's most luxurious natural fibre. Recent product innovations present exquisite Merino fibres that feel incredibly soft, providing uncompromised next to skin comfort. The versatile, high quality natural fibre offers luxury qualities to meet demands of high end consumers. A new **Merino Touch ™** woven coating fabric made from mercerised Merino yarns has been woven in such a way as to create cashmere like softness and silk like sheen – providing a touch of luxury in an affordable garment. Manufacturers can produce classic garments that look and feel luxurious, yet be reasonably priced. Retailers will be able to offer new ranges with the drape and fluidity of silk and the touch and sheen of cashmere, but with the performance and price point of Merino wool. New developments in creating **machine washable wool/polyester** blend suits, which have all the style and versatility of a 100% wool garment and will not shrink or pucker after machine washing. **MerinoFresh™**, based on the world-first rinse and clean 'shower suit' technology, allows woven products made from Merino wool to be refreshed or cleaned after wear simply using a domestic shower. Australian researchers have developed woollen clothing that changes colour in the sun and **blocks harmful UV rays**. A polymer has been created that is mixed with a photochromic dye to trap its pigments. The polymer-dye mix is used to colour the wool. The polymer also absorbs UV rays and increases the fabric's sun protection factor. When the dyed fabric is exposed to sunlight, the dye molecules change structure, changing the appearance of the dyed wool. **Low mark range** Limited and simplistic explanation of only a very few new developments which will assist the consumer in the care and maintenance of wool and hair fibre products. Some inaccuracies in explanations given. Sentences may not always be well connected. There will be a number of errors of grammar, punctuation and spelling.	0 – 3 marks
	Mid mark range A more thorough description of a number of new developments which will assist the consumer in the care and maintenance of wool and hair fibre products. Some accurate information but there is a lack of detail. Sentences are reasonably well connected. There may be a small number of errors of spelling, grammar and punctuation.	4 – 7 marks
	High mark range An in-depth answer, detailed and accurate descriptions of a range of new developments which will assist the consumer in the care and maintenance of wool and hair fibre products. A very good understanding of these new developments shown within responses. Sentences and paragraphs follow on from one another smoothly and logically. There are few, if any errors of grammar, punctuation and spelling.	8-10 marks

04	Sales and marketing cycles should be explained. From introduction of a new product through a period of growth to a mature stage where the product will have mass appeal to the final stage of decline and falling sales and profits. Diagrams may be used to amplify responses. The **Fad cycle** would be represented by a steep introduction and growth of a new 'high fashion/ radical new story/ must have fashion product'. There would be little or no maturity stage and the product sales decline as quickly as they grew, as once the product is accepted it is no longer a fashion Fad. The sales cycle for a fad will tend to be rather short. It may be a seasonal product, eg for Xmas, Jubilee. The **Classic product cycle** would see a gradual period of introduction and once accepted and established as a classic product the maturity stage would continue in an undulating pattern, with no obvious decline in the sales cycle. Maintaining popularity with its target markets. Eg 'little black dress'. The **standard fashion cycle** follows a bell curve with a gradual period of growth and the plateau at the maturity stage is the longest part of the cycle, then there is a gradual decline in sales. Eg leggings. **Low Mark Range** Limited response with little or no accurate detail about the sales and marketing cycle for each product clothing group. **Mid Mark Range** Reasonable information and some accurate references given about the sales and marketing cycle for each product clothing group. **High Mark Range** Detailed information and very accurate references given about the sales and marketing cycle for each product clothing group. A very good understanding is evident in response.	0 – 1 mark 2– 3 marks 4 marks (3x 4marks)

05	A product life cycle considers all stages of a products life from the **initial idea** and concept through product development to the **disposal** of the product after it has finished its useful life. An understanding of the impact upon the **environment** of a product throughout its lifetime would be considered during the concept stage. The **manufacturing cycle** would need to be considered under processing. An understanding of the **impact** of the product on the consumer, how long the **selling period** may be. Consideration of the **care** and maintenance of the product in the utilization stage and the options and possibility of disposal including recycling. What the expected period of use is and the possibility for product **replacement**. **A description of the fashion life cycle – maximum 2 marks**. **Low Mark Range** Limited response with little understanding shown of a product life cycle analysis. **Mid Mark Range** Reasonable response with some detail and understanding shown of a product life cycle analysis. **High Mark Range** Detailed information and a very clear understanding shown of a product lifecycle analysis.	0- 2 marks 3 - 5 marks 6 - 8 marks
06	Moral, ethical, environmental, social, price **constraints**, **market sector**, competition, manufacturing feasibility and viability, fashion **trends**, previous sales and marketing information including consumer feedback, **health & safety** regulations, conformance to quality standards, BSI standards, **materials and components** supplies, pre-manufactured components, supply chain distribution, **manufacturing** capability and capacity, delivery dates and time scale. **Low Mark Range** Limited response with little understanding of the key issues that need to be taken into account when developing a new textile product. Sentences may not always be well connected. There will be a number of errors of grammar, punctuation and spelling. **Mid Mark Range** A more detailed response with some understanding of a range of key issues that need to be taken into account when developing a new textile product. There will probably be some generalised information and the response may be repetitive. Sentences are reasonably well connected. There may be a small number of errors of spelling, grammar and punctuation. **High Mark Range** Detailed information and a very clear understanding shown of a wide range of key issues that designers need take into account when developing a new textile product. Relevant information clearly explained. Sentences and paragraphs follow on from one another smoothly and logically. There are few, if any errors of grammar, punctuation and spelling.	0- 2 marks 3 - 5 marks 6 - 8 marks

07	Candidates should make reference to the main influences on the styles of the era – this may be a period of about 10 years around the date of the illustration. They may include details of designers, fabrics, colours, and accessories of the period. There should be some explanation to relate the style shown in the selected illustration to the influences. **1988 Oleg Cassini** The 1980s brought a shift from the somewhat restrained fashions of the late 1970s towards far more expensive, ostentatious fashions reflecting the money-obsessed image conscious era. It became smart to indicate wealth by wearing expensive designer clothes and accessories, and the right **logo** was an important part of this showiness. Finance was big news and the lifestyles and huge salaries of young stockbrokers were revered; this competitive group of people became known as ***Yuppies***. Women were entering the workforce in greater numbers and the big-shouldered ***power suit*** became a symbol of their success, indicating efficiency and ambition. Programmes like ***Dallas*** and ***Dynasty*** showed women in super-bitch roles wearing extravagant wide-shouldered costumes. Princess Diana was also considered to be a trendsetter with ***New Romantic*** styles influenced by Vivienne Westwood and historical costume developed as an alternative to the fairly masculine power dressing styles; corsets and full skirted styles in extravagant fabrics were popular evening wear fashions. Produced in 1988 the illustration shown is an example of the **power dressing silhouette**, over sized shoulders, the power dressing skirt suit or 'power suit' with a cinched in waist. Although trousers for women were now accepted in the workplace, skirts remained the safer option. Masculine influences were also seen in coats. Other influences were active wear and a very slim body silhouette; casual wear reflected a wide, layered look. **1970 Bill Gibb** At the start of the 1970s high standards of living and prosperous consumer societies were firmly established in the developed world, but women's greater self-confidence and independent attitudes, together with the power of the mass market were equally important. The full length **maxi and calf length midi skirts**, added to the basic silhouette of the late 60s, were still promoted by designers. But adding length without introducing new lines and altered proportions did not have enough impact to make women want to wear the midi length clothes, and many women carried on wearing minis, leaving clothing manufacturers with huge stocks of unsold calf-length garments. Women no longer accepted new designs unless they liked them and felt ready for a change, and the clothing industry was made to realise that it was the **mass market** appeal of new styles that determined their success; the era of the dictatorial designer was finally over. With their self-confidence shaken, manufacturers faced 1971 with determination to give the public what they wanted and variety of choice seemed to be the safest bet. Old favourites were revived and several new ideas tried. Front buttoning, top of calf-length skirts with the buttons left open to the thigh, and worn over matching or contrasting tightly fitting shorts called ***hot pants*** were introduced and girls with the right figure loved them and caused a sensation dancing in their satin disco shorts. Produced in 1970, **this fashion design illustration** is for a long pleated skirt, long-sleeved blouse, laced jerkin and cloche hat, shown with fabric samples The design shows how different wool fabrics are used with contrast colour and pattern, to create mix and match combinations.	
07 cont		

07 con	Ethnic and romantic folklore influences are evident. This continued to be a key look with frills, flounces and embroidery and a strong exotic influence in evening wear. **Trouser suits** became very popular and were an international fashion worn by stylish young women. Trousers were very wide and often looked like a long flared skirt; the two most popular styles were ***flares*** and ***bags***. During the early 1970s many aspects of fashionable dress, accessories and hairstyles became very similar for men and women, and fashion became more **unisex in** style. The wide trousers were worn with blousons and fitted blazers. The early 'Punks' shocked with their aggressive looking street styles. **1920 Norman Hartnell** The fashionable ideal for women in the early post-war years was young and girlish with an adolescent figure. Perhaps as a reaction to the brasher post-war years, many designers in 1922 and 1923 tried to bring back more elaborate fashions influenced by period costume, and periods from ancient Greece to the 1880s were studied for ideas. The excavations of Tutankhamen's tomb created interest in ancient **Egyptian influences** and Egyptian style embroideries and motifs were used on dresses, jackets and cloaks. But the attempts to return to more elaborate dress had very limited success as it was against the general development in women's emancipation and the faster pace of life. With the popularity of the shorter, straight silhouette many fashion conscious women tried to achieve a completely flat shape. Foundation garments were designed to deliberately flatten the breasts and a few women even bound their breasts. The 1920s woman had arrived and clothes had become simpler and scantier than anything before; many women thought that they had already reached the ultimate in modern, practical clothes. The very **simple shape** allowed many women to make their own dresses and in the difficult economic circumstances experienced in many families, home dressmaking was the only way many could afford to dress themselves. The sketch of the black cocktail dress was produced in London during the 1920s. Hartnell designed this dress with two materials in mind: the under dress is of solid material and is covered from shoulder to hem with chiffon. The dress has a boat neck line with tight sleeves up to the elbow where they fan out with 'scallop' edging. This matches the hem of the dress. Also included is a beaded belt with tassels, matched with a band of beads on the sleeves. The design also shows a large head band with sparkling embroidery. The simplicity and grace of this dress would have been perfect for the fashionable cocktail parties of the era. The dropped waist, narrow, boyish shift dress silhouette, bobbed hairstyle was typical of the 'flapper' style seen at the time. Dresses were often trimmed with fringes and tassels. By 1924 skirt hemlines had risen above the knee. Knitted fabrics eg as used by Chanel, artificial silks, and long jumpers also became popular. Masculine influences were seen in suit jackets and day coats. **1913 Melanie Vermot** The first half of the 1910s was extremely fashion conscious with many new changes appearing. The new concepts of dress that had started in the late 1900s, especially Poiret's ideas, began to take on and be developed further. The new style dresses had simple round or V necks, breasts were less emphasized and waists much easier fitting. Legs were now the focal point and very narrow skirts – **hobble skirts –** appeared but did not stay for long. Poiret was strongly influenced by the art and design of the Middle East and India and the influence of the **Far East** and the orient is clear from the tunic and kimono shape tops and harem pants of 1910 to1919.	

07 cont	The **peg top skirt** and **tunic line** became very popular. Between 1912 and 1914, younger women's fashions changed fundamentally and the changes in the silhouette were further emphasized by the growing use of **flimsy materials**, particularly for summer dresses and evening outfits. During the early years of the 1910s, designers used lighter and softer fabrics in order to make their creations increasingly free flowing. This new approach focused on fluidity provided a contrast with the stiff and S-Bend silhouettes of the previous decades. The introduction of the **V-neck** in 1913 was considered to be akin to indecent exposure and doctors warned that it was a danger to health. V-neck blouses with triangular opening in the front were dubbed ***pneumonia blouses.*** **Dancing** was very popular and had a strong influence on fashion. The appeal of the Russian Ballet was at its height and Russian style blouses with bright-coloured embroidery were very fashionable. The tango, considered to be dramatic and erotic, helped popularise vampish-looking evening dresses, heavily trimmed with beads and fringe. The energetic new dances needed easy fitting dresses with long slits. By 1914 the fashion changes of the early 1910s had affected the clothes most women wore, and established ways of dressing were brought up-to-date by adapting them to the new silhouette. Women were more active and could not lead busier lives in the fashions of the early 1900s. By the start of **WW1** in 1914, clothes had become easier fitting and by 1915, shorter, fuller skirts between low calf and ankle length were worn by many women. During the next couple of years they became slightly shorter and styles more practical. As the war continued many women joined the armed forces, trained as nurses or undertook some kind of war work, and functional clothes became an accepted everyday sight. Women of all classes now wore the same clothes when on duty in the services or working in the factories. Produced in 1913, these two **evening dress designs** are good examples of the use of flowing material; the tunic in the right hand design is made out of pleated material. The shoe length straight or draped skirt with a blouse-like top was a popular silhouette. **Low Mark Range** Limited response with little detail about selected illustration and how it relates to the influences of the era when it was produced, little or no reference to key styles of the time, some inaccuracies regarding dates. Little reference to textile products (colours, shapes, styles, fabrics, prints), or wider social influences. Sentences may not always be well connected. There will be a number of errors of grammar, punctuation and spelling.	0 - 2 marks
	Mid Mark Range Good information about selected illustration and how it relates to the influences of the era when it was produced, some reference to key styles of the time, some accuracy regarding dates. Some reference to textile products (colours, shapes, styles, fabrics, prints), wider social influences. Sentences are reasonably well connected. There may be a small number of errors of spelling, grammar and punctuation.	3 – 6 marks
	High Mark Range Detailed information about selected illustration and how it relates to the influences of the era when it was produced, very good reference to key styles of the time, accurate dates. Detailed reference to textile products (colours, shapes, styles, fabrics, prints), wider social influences. A very good understanding is evident in response. Sentences and paragraphs follow on from one another smoothly and logically. There are few, if any errors of grammar, punctuation and spelling.	7 - 9 marks 2 x 9 marks

08	The effects of WW2 made fashion less exclusive and clothes became more democratic, catering for a much wider market. WW2 affected civilian life far more than WW1. Food and consumer goods were scarce and often severely rationed. The pre-war pace of fashion stopped and most women had to adapt their way of dressing to the changed circumstances. There were more women in uniform than ever before and the uniforms consisted of the same basic types of garments: military caps, shirts and ties, tunic jackets with matching skirts, thickish stockings and flat lace-up shoes. Women not in the services went to work in plain, functional civilian clothes which gave a drab appearance. The general silhouette of women during the war was quite plain and square. Jackets, coats and even dresses and blouses had padded shoulders to give a severe outline whilst skirts were straight and narrow. Women of all ages and classes whose lives were constantly affected by air raids wore trouser outfits. Clothes and fabrics were **rationed** from 1941 onwards and everyone was issued with an annual number of coupons to be used when buying clothing. Women took great care of their clothes in order to make them last and many made their own clothes, often re-cutting older garments in order to make new ones. There was a great deal of uniformity and austerity and ***make do and mend*** was the motto. Regulations were introduced that limited the quality and amount of material allowed for every type of garment, including the number of pockets and buttons. They were called ***utility clothes*** and had a special symbol **(CC41 – Clothing Control 1941)** stitched into them. To make sure that clothes were affordable to the majority, and to stop profiteering, they were price controlled. The amount of cloth used in a garment was restricted and rationed; styles were slim, avoiding flares and lots of pleats, in order to preserve cloth. Skirts lengths were shorter, jackets were single breasted. Influences from the military were apparent. The woman's land army required utility labourers clothing and woman wearing trousers became common place. The 'make do and mend' phrase reflected the reworking of textiles, including the use of curtains for clothing, adaptation and reconstructing of clothing, re-knitting woollen products, re-styling men's suits. Nylon stockings were introduced from the US, seams were sometimes drawn onto the back of legs to simulate nylons. **Low mark range** Limited and simplistic reference to the fashions of the 1940s. Superficial understanding of the term 'make do and mend'. Some inaccuracies in explanation.	0-3 mark
	Mid mark range Some accurate information about 1940s fashions and the reasons for them. There will be some understanding of the term 'make do and mend' and the effects of rationing on fashion although there will be some inaccuracies.	4–6 marks
	High mark range An in-depth answer, detailed and accurate reference to the 1940s fashions and the impact of rationing and war work. There will be clear explanation of the term 'make do and mend' and the response will illustrate a very good understanding of the subject.	7–10 marks

09	A PDS system is a **CAD system** software that incorporates pattern design, grading and marker making. It enables fast and efficient pattern development enabling patterns to be prepared very quickly for automation. It enables file sharing and storing of **data** for fast access. Allows **complex** darts and fit in pattern shapes to be made quickly. It lowers pattern production **costs**. It can **grade** nests of pattern sizes. It can transfer the patterns to marker **maker plans** ensuring fabric efficiency. **3D virtual garment modelling** can be incorporated and once approved, patterns can be produced from the computer model enabling important design decisions to be made before a physical sample is produced; saving both time and money. Patterns developed in PDS systems can be used to create **virtual samples.** The ability to **save and embed** the 3D files allows for maximum flexibility. Virtual samples reduce the need to exchange physical samples through the mail, saving time and costs and improving **communication** across the globe. 3D samples enable faster **detection of errors** and earlier corrections. Presentation of **real life images** of collections, ranges and colour ways in high quality, interactive 3D. Catalogues and ranges can be accessed at any point in the pre-production, production or merchandising process. Virtual Samples can be used for internal **design reviews** before factory creates first prototype samples Create the **perfect fit** with the most advanced fabric draping capabilities. Simulate texture, draping and fit of garments by displaying them on a realistic, **virtual human body** form based individual patterns, fabric and texture data and draping simulation Create **custom fit** for individual orders and from high tech 3D body scanners or low-tech Expert software decreases reliance on highly skilled operators. Imports order information from various sources. **Low mark range** Limited and simplistic explanation of the advantages of a Pattern Design System. Will tend to concentrate on accuracy and efficiency. Some inaccurate information and few examples given. **Mid mark range** A more thorough explanation of the advantages of a Pattern Design System. Response will go beyond accuracy and efficiency and give some more detailed and varied points. Some accurate information and a reasonable number of examples given. **High mark range** An in-depth answer, detailed and accurate explanation of the advantages of a Pattern Design System. Very accurate information and a wide range of examples given.	0- 2 marks 3 - 4 marks 5 - 6 marks

10	An automated CAM lay plan system will ensure the pattern pieces are organised in the most **efficient** way to economise on the use of fabrics. The patterned fabrics would be scanned in or held on a database and will be programmed to take into account the **direction** and scale of **pattern/pile** in order for seams to be matched accurately, for pockets, collars and panels to be laid in the required direction for the style to be manufactured (straight or cross grain). Balance of checks and stripes across panels and alignment at construction points. All pattern pieces will be tessellated to create the most cost effective marker plan. The **speed** of this process would be much quicker than a manual process. Integrated sizes will also enable more efficient use of fabric. **Low mark range** Limited and simplistic explanation of how a CAM Lay plan system could assist in the manufacturing of batch produced suits made from patterned suiting cloth. Response will tend to concentrate on fabric economy and/or accuracy **Mid mark range** More detailed explanation of how a CAM Lay plan system could assist in the manufacturing of batch produced suits made from patterned suiting cloth. Some examples given. **High mark range** Detailed and accurate explanation of how a CAM Lay plan system could assist in the manufacturing of batch produced suits made from patterned suiting cloth.	0 - 2 mark 3 - 4 marks 5 - 6 marks
11	Maximum performance can be achieved when spreading fabrics using an automated spreading device. It is designed for **repeatability** and productivity for volume manufacture. It is capable of spreading woven or knit materials from either rolls or folded packs and can adapt to most common spreading requirements and **multiple lays**. It will ensure **tension-free** spreading of fabric and provides accurate and consistent **spread length**. It accurately **aligns fabric** edges so parts can be nested closer to the beginning, end and edges of the spread, eliminating end loss and optimizing material utilization. It will provide quality and reliability. An automated system is designed to enable easy training of operators. It is not suitable for very delicate fabrics that can be easily distorted. **Low mark range** Limited and simplistic explanation of what the spreading device shown provides. Some inaccuracies. **Mid mark range** A more detailed explanation of what the spreading device shown provides. Some accurate information. **High mark range** An in-depth answer, detailed and accurate explanation of what the spreading device shown provides. A range of accurate information given.	0-1 mark 2 – 3 marks 4 marks

12	Computerised machines and sytems can be used for: **Fabric manufacture**: in the spinning, weaving, knitting and non woven fabric construction stages, eg a Jacquard automated weaving loom. **The dyeing** of fabric: accurate reproduction of colours in different batches, ease of communication and an easy to access database, improved systems of colour matching. **Fabric printing**: eg automated flat and rotary screen production, transfer and digital printing systems. **Fabric finishing**: eg pleating, embossing and other fabric finishing processes **Transferring lay plans** onto fabric, through plotting and printing devices, **Fabric cutting** systems including die cutters, laser cutting, plasma cutting, high powered water jets, ultrasonic cutting **Garment construction**: automated buttonholers, button sewers, bar tack machines and label sewers. Micro processors will ensure accuracy of stitches and consistency. Automated work stations, reprogrammable automated systems including pockets and collars sections. **Heat systems**: eg used for fusing, pressing, steaming and finishing products **Decorative processes**: eg embroidery and embellishment **Factory systems**: eg overhead transportation systems and movement of work in progress **Warehouse** and delivery systems **JIT** and EPOS systems, EDI, CNC. **Low mark range** Limited and simplistic explanation of computerised devices/systems that could be used in the manufacturing of textiles products. Candidate will tend to concentrate on a superficial range related to cost and efficiency. There will be some inaccurate information and few specific examples given. Sentences may not always be well connected. There will be a number of errors of grammar, punctuation and spelling.	0- 3 marks
	Mid mark range A more detailed explanation of the computerised devices/systems that could be used in the manufacturing of textiles products. Candidate may concentrate on specific processes with little reference to systems, or may deal with systems with few examples of specific processes. Some accurate information given, a varied range of examples given, especially at the top end of the mark range. Sentences are reasonably well connected. There may be a small number of errors of spelling, grammar and punctuation.	4 - 8 marks
	High mark range An in-depth answer, detailed and accurate explanation of the CAM devices and systems that could be used in the manufacturing of textiles products. Very accurate information and an extensive range of examples given. Sentences and paragraphs follow on from one another smoothly and logically. There are few, if any errors of grammar, punctuation and spelling.	9-12 marks

13	QA is the over arching system that assures quality across the whole organisation. 'Quality cannot be inspected into a garment; it must be manufactured into it.' **QA** is much wider than QC; it is about a company's commitment to quality at every stage of the design and manufacture process, including training of the workforce and the way in which problems are dealt with. It is about getting things right first time, and every member of staff is responsible for producing quality. **BSI** lays down standards for **QA systems**. Companies wishing to register for approved status must provide documented evidence of their Quality System and undergo regular inspections by BSI inspectors to ensure that the standards are being maintained. The general aim of QA is to decrease dependence on inspection as a means of achieving quality and to reduce the need to inspect all garments, by building quality into the garment in the first place, ie moving away from a reactive system. **QA** includes: **TQM** – Total quality management systems, **Quality circles** and quality departments, **Staff training,** Quality from design to despatch. **Quality Control** systems such as: **System 1**: the output model where the reject rate is high and an extensive repair system support this. **System 2**: Manufacturing quality rather than relying on inspections. Defects are traced back to the production processes and then eliminated (possible amendments or replacement of machines and the training of operators), use of Total Quality Control where standards of quality are set throughout all relevant areas of an organisation and throughout the supply chain. **System 3**: Company-wide quality control requires the commitment of individuals in all departments, not just in production. A **quality control cycle** includes: Studying the customer requirements, satisfactory design, fabric specification, garment specification, manufacturing specification, meeting design requirements, meeting standards, inspecting garments, agreed tolerances, instructions, user experience and feedback, the designer and quality control. **Implications** for the manufacturer could include: The **cost** of quality, in the form of implementing systems, **staff training**, cost of QA/QC departments, manufacturing throughput times being slowed down due to inspections but this is countered by quality products, **brand reputation** and product reliability, high levels of customer satisfaction. If there is no conformance to quality, savings in running a quality system would be made but this would allow the possibility of faulty products, lost reputation, reliability and consumer sales. Candidates may refer to specific QC checks, BSI standards for QA systems and textile products, consumer legislation and protection in relation to standards and quality, CE labels, Codes of Practice, quality symbols such as Woolblend mark.	

13 cont	**Low mark range** Limited and simplistic response. Answer will tend to concentrate on QC checks, including some appropriate examples. Little, if any, explanation of the term or implications for manufacturers. Sentences may not always be well connected. There will be a number of errors of grammar, punctuation and spelling. **Mid mark range** A more thorough explanation of Quality Assurance with some understanding of the systems and processes that make up QA. Candidate will describe a range of different QC checks and give examples. There may be little reference to the implications for manufacturers. Sentences are reasonably well connected. There may be a small number of errors of spelling, grammar and punctuation. **High mark range** An in-depth answer, detailed and accurate explanation of Quality Assurance and a sound understanding of the systems and processes that make up QA. There will be clear reference to the implications for the manufacturer of textile products. A **good answer which is about QC** rather than QA may be awarded up to 14 marks. Sentences and paragraphs follow on from one another smoothly and logically. There are few, if any errors of grammar, punctuation and spelling.	0 - 5 marks 6 -12 marks 13-19marks
14	A **Bespoke tailored suit** would require high levels of quality throughout the whole process from the measurements of the individual client, choice of cloth, making a toile, and throughout every stage of construction, often carried out by the individual tailor A **party dress** for a value retailer on the high street may only require the minimum checks that the cost of the product may allow. It may be that only a specified number of garments are checked from the batch being manufactured. The points at which the checks may be made may only be limited. The low price of the retail product cannot sustain a high level of quality inspection, although quality can be built in to the design stage. There will probably be a lower quality of fabric and components as price is the dominant factor here. A **premium brand** product would indicate a manufacturing system that would incorporate a reasonably high level of quality. A premium brand needs to support a quality reputation within the premium market sector. With embroidered detail and a premium price, most if not all products would be checked, faulty products would need to be repaired to pass quality standards. **Low mark range** Limited and simplistic explanation of the different levels of quality that would be integrated into the manufacture of the textile products listed. **Mid mark range** A more thorough explanation of the different levels of quality that would be integrated into the manufacture of the textile products listed. **High mark range** A detailed and accurate explanation, the different levels of quality that would be integrated into the manufacture of the textile products listed.	0- 1 mark 2 marks 3 marks (3x3 marks)

15	Candidates should describe the main features of each system, including the pros and cons for the manufacturer. Examples of different types of product may be included. **A UPS** is an advanced clothing manufacturing system, developed from an older mechanical system, in which a single garment is progressed through a sequence of operations. Using a unit production system, a garment is automatically transported via a computer-controlled overhead hanging system, which has been ergonomically designed to reduce the amount of handling of the garment. The computerised system is used to plan, control and direct the flow of work through a manufacturing system. The unit of production is the complete product which is taken automatically from one work station to the next. The rate of production is pre-determined and the computer sets the speed at which sections of the product are taken to the operator. All the parts required to make a single product are loaded onto a hanging carrier. The section of the product (eg back, front, pocket) is brought on the carrier by an overhead conveyor as close to the operator as possible, reducing the amount of movement needed to position the item to be stitched. Some operations can be carried out without removing parts from the hanger. Different operations are carried out at individual workstations; when complete the operator presses a button and the carrier moves to the next operation. Each garment is tracked within the system and any problem with QC can be traced back to the operator to be corrected. The system is cost and time-efficient; it allows manufacturers to respond quickly to market demands and as many as 40 different styles can be manufactured at one time, labour costs are reduced because there is no handling of bundles, any problems are immediately obvious and not hidden in bundles, it provides high levels of quality and garments are hung at each stage of manufacture, space in the factory is used more effectively, and the total work load of the factory can be balanced efficiently. But the systems are expensive to install and require specialist training for employees. **Progressive Bundle System** Very large quantities of products are made over and over again in **assembly line** production. The garments are gradually assembled as they move through successive sub-assembly and main assembly operations in bundle form. Machines are in continuous use for long periods of time so they are very specialised and expensive. The machinery and the operator skills are very specific for the job in hand. A number of operatives work on the production line and each does one part of the manufacture before passing the product to the next person who does a different job. Workers become skilled at doing one part of the manufacture but may need to be re-trained to do other types of work. This system enables them to make identical products very quickly but can be very boring for the workers. The system reduces time and costs but changing the line to make a different product can take a long time. This method is not usually used for high fashion clothing as styles change often. Some factories may specialise in products which don't change often, eg jeans. The system layout involves a work store to be positioned at the start and end of every section; these buffers are used to store work received from a preceding operation, and to hold work completed by that section. Because of these work stores or buffers, each section is not directly dependent on the preceding section, but can absorb slight variations in output via the stocks.	

15 (cont)	The progressive bundle system, while being somewhat cumbersome in operation and requiring large quantities of work in progress, is possibly one of the most stable systems as regards output. Unless there is serious absenteeism or prolonged special machine breakdown, most of the usual hold-ups can be absorbed because of the amounts of work in progress. Balancing and the changeover to new styles can also be simplified, due to the amount of work held in reserve. When properly managed, the progressive bundle system is versatile and efficient. **Section or Process System** This is a development of the making through system, with the difference that the operators specialise in one major component and sew it from beginning to end. For example, an operator specialising in fronts would assemble the front, set the pockets, etc. and perform all the operations required to finish that particular component. The sewing room would have a number of sections, each containing versatile operators capable of performing all the operations required for a specific component. The sections are built according to the average garment produced. These could include: • Pre-assembling (the preparation of small parts) • Front making • Back making • Main assembly (closing, setting collars and sleeves, etc) • Lining making • Setting linings • Finishing operations (buttonholes, blind-stitching, etc) The section system is a very efficient system for producing a variety of styles in reasonable quantities. A diagram may be used to illustrate layout. **Low Mark Range** Limited response with little detail about the way in which the system works. There will be some inaccuracies and confusion, with little understanding shown. **Mid Mark Range** Candidate will give some detail about the system. Reasonably accurate descriptions with some understanding shown in the response. **High Mark Range** Detailed information about the production system. Very accurate descriptions and a thorough understanding of how it works shown in the response.	0- 2 marks 3- 4 marks 5- 6 marks (3x6 marks)

16	Implementing an effective PPC system helps manufacturers remain **competitive** in the ever changing fashion environment. The current market requires more styles, smaller orders, increased product complexity and much shorter lead times. An effective system will allow production to **plan movements** between warehouse to manufacture and to the distribution streams involved. Production can be planned in a global environment. **Advantages of this computerised system include:** Improved use of **available capacity** and ability to constantly monitor flow of production. Improved 'on time' **materials and components availability** and supply. Fewer production **stoppages** and lower excess costs due to 'waiting time'. Improved control of **'Work In Progress'** hence reduced use of overtime to solve problems. Improved **production performance** therefore lower air freight and late delivery penalties. Ability to **respond quickly** when requirements change. Alternative planning solutions can be implemented. Reduction in lead times through improved control. Central storage of all **information** in a single place to allow improved decision making. More efficient **planning of processes** and machine requirements. This is particularly useful in businesses with multiple manufacturing sites. It provides visibility of all orders and their status and provides the planner with a mechanism that can be used to effectively manage free capacity and the allocation of orders at the most appropriate factory/supplier. Efficient planning for **style change over**. To **track orders** throughout supply chain, to deal quickly with transport and delivery issues. **Disadvantages:** There are few disadvantages as there are obvious commercial gains. The cost of the system and the need for trained personnel and for constant upgrading. The need to be compatible with all suppliers in the chain for greatest efficiency. **Low mark range** Limited and simplistic explanation of the advantages and disadvantages in implementing a PPC system. there will be inaccurate information and only basic points made. Focus may be on only a few advantages. Sentences may not always be well connected. There will be a number of errors of grammar, punctuation and spelling.	0- 3 mark
	Mid mark range A more thorough explanation of the advantages and disadvantages there are in implementing a PPC system. Some accurate information with a reasonable numbers of points given in the response. Sentences are reasonably well connected. There may be a small number of errors of spelling, grammar and punctuation.	4- 6 marks
	High mark range A detailed and accurate explanation of the advantages and disadvantages to implementing a PPC system. Excellent understanding shown with a very good range of points made. Sentences and paragraphs follow on from one another smoothly and logically. There are few, if any errors of grammar, punctuation and spelling.	7- 10 marks