CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International Advanced Subsidiary and Advanced Level

MARK SCHEME for the October/November 2015 series

9631 DESIGN AND TEXTILES

9631/03 Paper 3 (Textile Applications and Technology), maximum raw mark 100

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CAMBRIDGE
International Examinations

Section A

Answer **both** questions

1 The choice of fabrics and designs for childrens' school uniforms need to be fit for purpose.

(a) (i) Draw and label a sketch of one item of school uniform for a child. Include front and back views and two style features. [4]

Answer could include:

- **items of school-wear** could be one of the following items: dress, shirt, trousers, skirt, jacket, (accept any other suitable item of school uniform); shorts (young boy); sweater/jumper; pinafore dress (must have blouse/top under dress);
- **suitable fabrics: for skirts/shorts/jackets/shorts (young boys) /sweater/jumper/pinafore dress (must have blouse/top under)**: cotton gabardine; cotton/polyester gabardine; polyester twill; viscose/polyester twill; cotton jersey (jumper/sweater)
- **for shirts**: cotton cambric; cotton/polyester poplin; cotton pique; cotton double jersey;
- (or any other suitable fabric)
- **style features could include**: patch pockets; pockets in a seam; top-stitching; princess seams (on a bodice); knife pleats; box pleats; inverted pleats; revers – on a jacket); waistband (on trousers or a skirt); any other suitable style features;(fabric finishes e.g. permanent pleats, Easycare)
- Front and back views to be included. Must be accurate sketches. [1 mark for each well labelled point up to 4 marks] Only 1 item required.

(ii) Name one suitable fabric for your design and explain five reasons why the fabric chosen is suitable for school wear. [6]

Answer could include:

- **suitable fabrics: for skirts/trousers/jackets**: cotton gabardine; cotton/polyester gabardine; polyester twill; viscose/polyester twill; must give fibre and fabric (construction) for full marks.
- **for shirts**: cotton cambric; cotton/polyester poplin; cotton pique; cotton double jersey;
- (or any other suitable fabric);
- **hard-wearing:** garments which are part of school-uniform are worn regularly and need to be able to withstand regular wear;
- **washable:** garments need to be washed regularly as they are worn all day and the fabric. needs to be hard-wearing enough to withstand this;
- **absorbent**: if the garments is worn next to the skin, it needs to be absorbent; it also needs to be suitable for different weather conditions such as hot/cool weather;
- **comfort**: the fabric needs to be comfortable to wear so non- irritant, not itchy and needs to be non-allergenic – often cotton is chosen for this reason;
- **able to keeps its shape:** polyester fabrics and cotton fabrics are often chosen for school uniforms as the fabrics are usually firm and non-stretchy so keep their shape;
- **Easycare finish** – helps to reduce creasing/need for ironing;
- **easy to iron**: if the fabrics are washed regularly, they need to be either drip-dry or easy to iron to save time so fabric finishes may have been applied to the fabrics/garments (examples can be given – credit these if correct and relevant);
- **cost:** Polyester, acrylic and cotton fabrics are produced in large quantities and therefore the cost is lower. School uniforms need to be low in cost so as to be available to everyone. [1 mark for appropriate fabric for the design and each well-discussed point should be awarded 1 mark up to 5 marks]

(b) Describe three machine stitches which could be used in the manufacturer of school uniforms and give one reason why each would be suitable. [6]

Answer could include:

- **straight stitches** would be used in the making of seams such as plain or double-stitched seams/lockstitch/strong seam
- **zig-zag stitches** may be used in the neatening of seams although this would not be as common as the use of overlocking; (**zig-zag** stitching could be used for neatening seams e.g. in homemade school dresses.)
- **Top stitching** may be used on right side as a decorative features; (straight stitch)
- **overlocking**: the overlocker can produce a variety of stitches, whether just overlocking the edges to stop fraying (3 thread overlock stitch) or by stitching the seam and neatening the edges at the same time (4 thread overlock stitch) – this is more likely if the school uniforms are mass produced rather than produced in batches;
- **Cover stitch** may be used as a decorative feature; blind hem stitch, logo embroidery accept labelled sketches.[1 mark for each appropriate stitch and 1 mark for each reason].

(c) Assess the benefits of Eco-labelling for both the textile industry and the consumer.

Answer could include:

- Special labels are used on garments to indicate to consumers whether the fabrics have come from sources which have had special growing conditions or manufacturing which is more environmentally friendly; this means that the fabrics reduce the harm to the environment; they may cause less pollution due to less chemicals used during production of the fibres/fabric or in the processing of the fabrics/garments e.g. types of dyes finishes used;
- possible labels could include:
- The **Global Organic Textile Standard GOTS** for which the logo has a white shirt on a
- green background defines requirements to ensure organic status of textiles from harvesting through to the manufacturing and labelling stages. www.global-standard.org
- The International Working Group on Global Organic Textile Standard is comprised of four reputed member organisations, namely OTA (USA), IVN (Germany), Soil Association (UK) and JOCA (Japan), which contribute to the GOTS, together with further international stakeholder organizations and experts, their respective expertise in organic farming and environmentally and socially responsible textile processing.
- The **Sustainable Cotton Initiative** focuses on some of the world's most important cotton producing areas where production severely threatens high value aquatic ecosystems e.g. Australia, Pakistan, India and Central Asia.

- **Ecomark India**. A government operated seal of approval program for environmentally preferable consumer products. To increase consumer awareness, the Government of India launched the eco-labelling scheme known as `**Ecomark'** in 1991 for easy identification of environment-friendly products. The criteria follows a cradle-to-grave approach, i.e. from raw material extraction, to manufacturing, and to disposal. The **Ecomark** label is awarded to consumer goods that meet the specified environmental criteria and the quality requirements of Indian Standards.

May also include:

This flower symbol used by EU guides the consumer to a product which has the best environmental performance; accept any other suitable/similar symbol.

Organic cotton symbol, means that the fabric used was grown without pesticides or other chemicals.

[Give credit for correctly labelled sketches]

High: a wide range of factors will be given showing knowledge and understanding when assessing the the benefits of Eco-labelling available for both the textile industry and the consumer. Specific and relevant examples will be given. [8–9]

Middle: a number of factors will be given showing some knowledge and understanding when assessing the benefits of Eco-labelling available for both the textile industry and the consumer. There may be some errors. Some examples may be given some of which will be relevant. [4–7]

Low: few if any relevant points will be given, there may be inaccuracies and there may be no assessment, just a list of points. The textile industry and the consumer may be mentioned. Few if any relevant examples will be given. [0–3]

[Total: 25 marks]

2 The sewing machine can be used for producing decorative designs on textile items.

(a) (i) Draw one design suitable for machine quilting, which could be used on a decorative panel for a lady's jacket. Label the stitches to be used. [3]

Answer could include:

- a sketch of a panel (rectangle/square/other shape) to show a design which can be machined. The design does not have to be drawn onto a jacket but its position can be indicated;
- design can be floral, abstract, from a man-made idea such as buildings, etc. Design needs to be flowing/continuous as the machining would be easier; colour may be indicated;

[1 mark for each appropriate label which will include the correct names of stitches]
Straight-stitch; decorative stitch (must be suitable for quilting)

(ii) Explain how to prepare the fabric and sewing machine before quilting. [6]

Answer could include:

- how to prepare the sewing machine:
- longer stitch e.g. 4 or 5 instead of 2 or 2.5;
- may need to alter the tension to make it slightly looser if the fabrics are thick;
- attach a different presser foot e.g. quilting foot or embroidery foot: these are not so long and can accommodate thick fabrics;
- attach a quilting bar if this is needed for spaced lines in the quilting design;
- any other suitable adjustment of the machine;
- suitable machine needle; thread machine with appropriate colour/thickness of thread
- how to prepare the fabric before working the machine quilting:
- make sure the fabric is flat (iron if necessary);
- mark the fabric with the design e.g. with tacking in a contrasting colour or tailor's chalk, or fabric marker;
- allow extra fabric around the edges to allow for shrinkage of the design after the quilting is completed. Fine pins may be used where tacking (basting) catches in the machine's presser foot.
- prepare the two or three layers of the fabric to be quilted by tacking together securely, usually done with diagonal tacking; (wadding; cotton batting; not felt)
- place fabric in an embroidery hoop if free machining is being worked, or make sure the fabric is securely attached together (different from the diagonal tacking above;
- [accept any other suitable point]

[1 mark for each detailed point; answer needs to refer to both fabric and machine preparation for full marks]

High: the answer will include a range of relevant points which will include an explanation of both how the fabric and sewing machine can be prepared ready for machine quilting; relevant and detailed examples will be given; [5–6]

Middle: the answer will include some points and brief explanation of how the fabric and/or sewing machine can be prepared ready for machine quilting; there may be errors and omissions; some examples may be included; [3–4]

Low: the answer will include few if any relevant points and little or no explanation of how the fabric and/or sewing machine can be prepared ready for machine quilting; [0–2]

(iii) Discuss how the quilting design for the decorative panel could be modified to make it suitable for producing a batch of 100 jackets. [6]

Answer could include:

- the batch production method is often worked using industrial machines so as the quilting design is machined, the design may have to be **simplified** to make it;
- **sewing machines** are more likely to be used than hand sewing as this is too slow and uses a lot of labour time;
- details of the **design** may be simplified to fit in with the technical capabilities of the sewing machine; CAD or Photoshop or other software/modify design easily e.g. colour/size;
- **stitch details** may need to be changed as the industrial sewing machine may have limited stitches compared to the machine which produced the prototype;
- the **manufacturer** producing the quilting may have different sewing machines and may have to adapt the design in order to fit in with his machines and according to the skills for his labour-force; design printed on instead of quilting;
- the **threads** and **colours** used may have to be changed from the original design as large quantities will have to be ordered as the prototype design may have used oddments/old stock/different colours; modified according to client's choice
- any other appropriate/relevant point.

High: A detailed and well-informed discussion of how the quilting design for the decorative panel could be modified to make it suitable for producing a batch of 100 jackets. Specific examples of modifications may be given. [5–6]

Middle: Some relevant information will be included in minimal discussion of how the quilting design for the decorative panel could be modified to make it suitable for producing a batch of 100 jackets. Information may be presented as a list with little discussion. There will be some errors in the answer. [3–4]

Low: Little relevant information will be included and there will be no discussion of how the quilting design for the decorative panel could be modified. There will be errors in the answer. [0–2]

(iv) State three reasons for using a sewing machine when producing decorative designs [3]

Answer could include:

- sewing machine produces **even regular stitches** every time so the design would be consistent;
- it is **quicker** to use the sewing machine rather than try to do the work by hand, which would not necessarily be consistent of the same quality as machine produced work;
- modern sewing machines are often computerised and they have a very **wide variety of different stitches** to choose from so this would be beneficial to the consumer and manufacturer as it could be used to produce a variety of different designs;
- Stronger stitching & durable

[1 mark for each well-discussed point]

(b) Assess the benefits of recycling textile items which have decorative panels incorporated in their design. [7]

Answer could include:

- decorative panel sometimes have interesting designs and they are often **not worn out**;
- may have an **original design** which you may not be able to re-create;
- design may be from a **special/historical techniques** from a particular country/culture which could be preserved;
- recycling **reduces pollution**/using more new resources/reduced textiles being put into landfill sites;
- several pieces of recycled textiles could be re-used into one garment;
- recycling could **reduce the cost** of the final item as the decorative panel does not have to be made from new so reducing the costs of labour and raw materials;
- **consumers** may be more likely to buy items which have recycled goods as part of them as they may be interested in reducing pollution/reducing global warming;
- consumer may visit **charity shops** to donate or buy items;
- manufacturers may purchase items to **upcycle** (re-work) items for re-sale.
- Any other relevant point;

High: The answer will include a detailed assessment of the benefits of recycling textile items which have decorative panels incorporated in their design. Well-informed knowledge and understanding will be evident and specific examples will be given; [6–7]

Middle: The answer will include some assessment of the benefits of recycling textile items which have decorative panels incorporated in their design. Some knowledge and understanding will be evident although there may be errors and some examples may be given; [3–5]

Low: The answer will include little if any assessment of the benefits of recycling textile items which have decorative panels incorporated in their design. Little if any knowledge will be evident or the information may be presented as a brief list. [0–2]

[Total: 25 marks]

SECTION B

Answer two questions

3 Fabric finishes are available for many different textile items.

(a) Assess the range of fabric finishes which can alter the texture and appearance of one named cotton fabric and one named synthetic fabric. Give specific examples of textile items in your answer. [10]

Answer could include:

- **starch** added to fabrics during laundering, to make fabric stiffer e.g. cotton poplin;
- brushing – fabric is brushed on one side to produce a fluffy surface which traps air and makes the fabric warmer;
- Cotton poplin, denim, calico **Sanding or emerising** gives a soft warm handle on cottons. Emery rollers raise the surface.
- **Brushing or raising** fabric is brushed on one side with fine wires to produce a fluffy surface which traps air and makes the fabric warmer.
- Stone-washed denim to give rough/uneven surface
- Mercerising (lustre/smoothness) for cotton; glazing; ammoniating – similar to mercerising (cotton and rayon)
- any other relevant point;

Answer could include:

- shiny surface could be produced by **calendering**, a way to buff the surface of cotton fabric by adding resin then calendering the surface to produce cotton chintz;
- **easy-care** finish so the fabric needs less ironing;
- Polyester satin, moiré,
- **Embossing** On synthetic fabrics a relief pattern is made durable with heated and engraved calendar rolls to give a textured surface.
- **Moire** A watermark pattern is produced when two ribbed fabrics are calendered together.
- any other relevant point;

Answer could include:

garment	Fabric finish	reason
Jacket	Stiffening	E.g. Produced a firmer fabric so appearance is less creased;
Trousers	Easy-care	Trousers not so creased and look smarter for longer – less ironing needed;
Sweatshirt	brushing	Makes the fabric warmer

Additional points: Shirt/blouse, sanding or raising, softer handle. Nightwear, brushing or raising, for warmth. Jacket, embossing, fashion motifs, individual or group identity. Evening/bridal dress, moiré, decorative, floating, watery appearance.

High: A detailed assessment showing well-informed knowledge and understanding of the range of fabric finishes which can alter the **texture** and **appearance** of **one** named cotton fabric and one named synthetic fabric. Specific detailed and accurate examples of textile items and fabric finishes will be given. Give credit for fabric names. [8–10]

Middle: Some relevant assessment of the range of fabric finishes which can alter the **texture** and **appearance** of **one** named cotton fabric and **one** named synthetic fabric. Some of the information will be presented as a list. Some relevant examples of textile items and fabric finishes will be given. There may be some errors. Give credit for fabric names. [4–7]

Low: Little if any relevant information will be given. Some of the information will be presented as a list with no assessment given. Few if any relevant examples will be given. There will be a number of errors. Few if any reference will be made to fabric names. [0–3]

(b) Discuss the range of performance finishes which are available for sports clothing. Give examples in your answer. [8]

Answer could include:

- sports clothing: specific sports may be mentioned e.g. running; tennis; swimming; ski-sports; etc.; items of clothing could include: tops/t-shirts, shorts/trousers; jackets/sweatshirts/fleeces; trainers other fabric footwear; outerwear for outdoor sports; any other relevant examples; microencapsulation
- **performance finishes** include: crease-resistance, flame-resistance, easy-care; anti-static; anti-bacterial; permanent effects e.g. pleating; etc.; soil-release, e.g. outdoor clothing. Coolmax: absorbency/keep wearer cool/sweat whisked away
- performance characteristics of synthetic fibres which would make the use of performance finishes beneficial:
- suffer from static due to low absorption rates e.g. polyester absorbs less than 1% of its own weight;
- **crease-resistance**: synthetics vary in how much they crease but it is beneficial in work wear to have minimal creasing so this would be a good finish for trousers, jackets, skirts;
- **flame-resistance**: all synthetics melt and drip so can be dangerous; modacrylics do not burn so readily as they are inherently non-flammable; this finish would be beneficial for items of clothing worn where risk of flames/fire;
- **showerproof**: a beneficial finish on lightweight jackets and coats when worn in the rain; suitable for nylon fabrics in particular;
- **anti-bacterial**: suitable for sportswear as it will reduce growth of bacteria and reduce odour; different types of polyesters are now used for sportswear and as they are generally not very absorbent unless modified, this would be a beneficial finish; tops/shoes/trainers;
- any other relevant finish/fabrics with detailed discussion if full marks are awarded;
- Water-repellent e.g. swimming costumes.

High: The answer will include reasoned discussion which shows detailed knowledge and understanding of the range of performance finishes which are available for sports clothing. Specific relevant examples will be given. [6–8]

Middle: The answer will include some discussion which shows evidence of knowledge of the range of performance finishes which are available for sports clothing. The answer may include a list rather than full discussion of topics and there may be some errors. Some relevant examples may be given. [3–5]

Low: The answer will include little if any discussion and may include a brief list rather of topics and there will be errors. Few if any examples will be given. [0–2]

(c) Discuss the value of the care labelling system to the consumer, with reference to a variety of different fabrics and types of symbols. [7]

Answer could include:

- **types of symbols** available: wash, ironing, dry cleaning; drying; bleaching; sketches of each could be given, but need to be correctly labelled to be given credit;
- **value of care labelling:** consumer knows how to look after the textile items to make sure they are kept in **good condition** and are not damaged;
- if the garments are cared for according to the labels on the items, they will **last longer**; where there are garments which have **mixed fibres**, the labels are important to inform the consumer of the best way to care for the fabrics;
- labels may have special instructions if **new fibres** have been used e.g. bamboo fibres;
- clothes will **not shrink/melt/distort** in the laundry process;
- cost-effective if good quality item bought and well looked after.
- **types of fabrics:** some are not damaged by laundering e.g. cottons and linen are stronger when wet so are not much affected by laundering; fabrics such as silks and wool are more delicate and may need gentle washing to avoid damage to the fibres; these delicate fabrics may need hand-washing only (this can now be done in some washing machines) or dry cleaned only which is a way to clean clothes without the use of water, which may damage the fibres; some fibres may be subject to deterioration during laundering e.g. viscose can be damaged if the wash is too vigorous so a reduced wash cycle could be chosen;
- some fabrics such as polyesters and nylons can have a short wash;
- types of detergents: biological to remove some types of stains; some washing powders/liquids contain bleach which remove stains or keeps whites whiter;
- where there are mixtures or blends of fibres on one item of clothing, care needs to be taken to follow the washing instructions for the weaker fibres so they do not get damaged;
- any other relevant points;

High: the answer will include detailed discussion showing knowledge and understanding of the value of the care labelling system to the consumer and a wide variety of different fabrics and types of symbols will be included and given as examples. [6–7]

Middle: the answer will include some discussion of the value of the care labelling system to the consumer and some different fabrics and types of symbols will be included and given as examples. The answer may be presented as a list and there may be errors. Many accurate examples of care labels given but little or no discussion **(3 marks).** [3–5]

Low: the answer will include little if any relevant information about the value of the care labelling system. Few if any fabrics and types of symbols will be included and the answer will be presented as a brief list with no discussion. [0–2]

[Total: 25 marks]

4 Environmental issues are important in the textile industry.

(a) Draw and label sketches of two matching fashion accessories which include the use of Tencel (Lyocell) or self-coloured cotton fabric and a design produced by a resist method of dyeing such as batik or tie-dye. [6]

Answer could include:

- any fashion accessory e.g. scarf, belt, bag, hat or other headwear, or any other suitable fashion accessory;
- any suitable design which has used dye although the design may not be very precise if the tie
- and dye method has been used; design may include more than one colour;
- if batik has been used, the design can be made from one colour, or more than one colour;
- front and back views could be included;
- design could include style features such as embellishment, fastenings; handles/straps (depending on the item chosen);
- 1 mark for each well labelled and accurate point; give credit for good quality sketches and if full marks are awarded the sketches must be well labelled. Up to maximum of 6 marks);
- need to explain how the accessories match together.

(b) Explain how Tencel (Lyocell) and self-coloured cotton benefit the environment. [4]

Answer could include:

- Tencel® originally Courtaulds tradename. Lyocell® Lenzig tradename. Tencel is now a Lenzig fibre.
- Generic name Man-made Cellulosic Fibres.
- Wood pulp from eucalyptus trees and chemical solvents. The chemical solvents are recycled. The Tencel® production process is a ‘clean closed-loop cycle’.
- Tencel (Lyocell) – regenerated fibres which are more environmentally friendly. Tencel (Lyocell) is a man-made fibre made with wood pulp; Sustainable trees are used, Tencel textiles are created through the use of nanotechnology in an award-win and the process re-cycled all solvents and deals with emissions safely. It is 100% biodegradable and the fabric/clothing is cotton-like.
- Self-coloured cotton:
- Cotton fibres are usually cream-coloured although cross-breeding with different types of cotton has allowed the introduction of brown cotton (introduced from 2000 and green introduced from 2003. There are also cotton fibres which are red/brown in colour (from 2005.) Coloured cotton does not have to be dyed as the fibres are already coloured. The Cotton does not need to be treated with chemicals so is more environmentally friendly.
- accept any other suitable points;
- must have reference to both fibres/fabrics for full marks.

[1 mark for a brief outline each point up to 2 marks; if the answer is well-explained, maximum of 4 marks]

(c) Discuss how your designs could be developed using different creative textile techniques. [6]

Answer could include:

- the design could be based on a cultural link e.g. Indian designs for tie and dye often used bright colours and may produce regular borders on cotton-type fabrics; applique techniques are sometimes used in Indian embroideries, using offcuts of fabrics;
- hand embroidery often used in Chinese textile items, satin stitch is popular used with silk thread which gives a shiny quality to the design;
- batik designs also originate from different cultures and the method varies from using a traditional tool such as a tjanting or a brush;
- Japanese Shibori using indigo dyes (fabric is blue colour) similar techniques to tie and dye but more variation of designs which are more intricate and small.
- Mola work (South American) uses layers of fabric to produce reverse applique where the design is cut away after stitching (by hand or machine).
- Creative textiles techniques can be achieved by combining some of the above methods together, using different colour combinations and different design sources. Dye techniques can be produced first and embroidery stitches can be added on top of the colour work. This makes the design more complex and interesting to look at; it may add additional texture.
- Details need to be given of other design ideas which have been used e.g. influence from a named fashion designer or craftsperson;
- the samples of variations can show how different colour-ways could be used;
- variations of the design could include variety of scale e.g. large areas of the design contrasted with smaller parts of the design repeated or as a one-off design incorporating both types of scale;
- different types of techniques could be combined e.g. tie and dye with normal dyeing combined with different methods of tying the fabric; or batik using a tjanting combined with brush strokes; some details of the batik design could be omitted to make the design simpler; tie and dye techniques using small objects could be alternated with areas which are tied with string or fine thread;
- give credit for detailed notes about the origin of the designs and how they can be developed; give credit for well-labelled sketches.

High: the answer will contain a detailed discussion showing relevant knowledge and understanding of how the designs could be developed using different creative textile techniques. A good number of specific examples will be given. Give credit for labelled sketches. [5–6]

Middle: the answer will contain some discussion and will show some relevant knowledge of how the designs could be developed using different creative textile techniques. Some points may be brief and there may be omissions. Some relevant examples may be given and sketches may be included. [2–4]

Low: the answer will contain some discussion and will show some relevant knowledge of how the designs could be developed using different creative textile techniques. Some points may be brief and there may be omissions. Some relevant examples may be given. [0–1]

(d) Discuss the reasons for having a manufacturing specification of materials for one of the accessories in 4(a). Give specific examples. [9]

Answer could include:

- answer needs to relate to the accessory given in 4(a).
- manufacturer needs to know the following information:
- **what sort of fabric is to be used:** it needs to be suitable for batik/dyeing and stitching when the accessory is made; if the fabric is not the correct colour according to the specification the client may reject the goods so the manufacturer will lose money;
- **fibre content** varies, and some fabrics may have blends of fibres; these will have different requirements when cutting, stitching and finishing fabrics;
- for example, any fabric with a satin weave may be slippery and will need care when cutting to make sure of accuracy; if the fabric is in its natural state e.g. self-coloured cotton, colours may vary from different batches on the roll (according to growing conditions) so extra checks may be needed and it may have to be checked visually before laying out/cutting;
- **different equipment** may need to be used: for example, band saw or rotary cutter or scissors may needed; pressing the products – different temperatures may be needed e.g. so that the fabric is not damaged by the incorrect temperature (too hot);
- **Materials** such as interfacing/stiffening may be required to strengthen or stiffen the fabric if the accessory needs it; for example, some fabric may need to have fusible interfacing attached and for others, non-fusible may be adequate; for example, a satin fabric is slippery and does not keeps its shape well so would benefit from fusible interfaing to help stabilise it;
- specialist equipment may be needed e.g. if eyelets are required on the accessory; if eye lets are not applied correctly, they may fall off in use and the customer will complain;
- if batik is used, wax may need to be removed thoroughly before the cutting is carried out;
- what **colour** and **type of dye** is to be used, so that when the fabric is prepared before dyeing, or batik work, the exact colour and dye is used to make sure the batch of items are made to the exact specification; if they are not produced to the exact specification, the customer and consumers may not be satisfied with the product so the manufacturer may lose money on the batch of goods;
- the exact **stitching** and **thread** to be used needs to be specified so that when the accessories are made up, the stitch will be appropriate to the fabric and it will be hard wearing during the use of the item, so that it is **fit for its purpose**;
- the **design** of the accessory needs to be exactly as the designer produced the prototype otherwise if there are variations, the items may not be in keeping with other items produced for that company and customers may be put off buying the items and will complain if the design or quality are not as expected;
- which **seams** are to be used; how are seams to be neatened e.g. if a plain seam, is overlocking the neatening method? How wide are seam allowances, 1.5cm or less and the tolerance allowed e.g. 0.3mm. If these are not followed, the final product size may vary, especially if the tolerances have not been accurately followed.
- Which **additional components** are to be used e.g. zips/eyelets/poppers/etc. for the accessories, sizes/lengths/colour/composition e.g. nylon or metal zips. If different components are used, the customer may complain if the products are not made according to the specification. If these are not in stock they production line may have to stop until the goods are delivered.
- Which **machines** are available for making the product; do the workforce know how to use the machines e.g. overlocking machines to stitch seams and finish edges; is there enough labour to carry out the batch of accessories by the deadline date. If the deadline is not complied to, the manufacturer may not have further business because they may be thought of as unreliable;

- Are any **additional processes** needed e.g. pockets in a bag; these may be need to be ordered as standard components or different workforce may make these. Additional time may be needed to make the accessories as some processes e.g. welt pockets are more complicated to make than patch pockets.
- Any other relevant point;

High: The answer will include detailed knowledge and understanding in the discussion of a good number of reasons for having a manufacturing specification of materials for one of the accessories in [a]. Specific detailed examples will be given. [7–9]

Middle: The answer will include some knowledge in the brief discussion of some reasons for having a manufacturing specification of materials for **one** of the accessories in [a]. There may be omissions and errors. Some relevant examples will be included. [4–6]

Low: The answer will include little or no relevant information about the reasons for having a manufacturing specification of materials for **one** of the accessories in **(a)**. There will be omissions and inaccuracies. Few if any examples will be given. [0–3]

[Total: 25 marks]

5 Details of yarns and fabrics are important to the manufacturer of textile products.

(a) Compare <u>four</u> performance characteristics of <u>one</u> named fabric which has been woven using yarns made from staple fibres and <u>one</u> named fabric which has been woven using filament yarns. [6]

Answer could include:

- **synthetic fibres** could include: polyester (melt spinning); nylon (melt spinning); acrylic (dry spinning) etc. ;
- **filament fibres** (examples of fabrics: **silk filament** e.g. silk chiffon, crepe de chine, habutai, organza, taffeta, shantung).
- These use natural fibres and have the following **performance characteristics**:
- smooth, lustrous fibres, warm to touch;
- **synthetic filament** fibres (examples of fabrics: nylon chiffon, organza, polyester lawn, polyester moire, crepe, satin) can imitate silk e.g. lustrous, smooth, also different thicknesses (fine, medium or thick), mono filament or multi filament years; or any other appropriate fibres/fabrics);
- **performance characteristics**:
- smooth, lustrous, slippery;
- synthetic fibres can also be **textured** by heat setting, not possible with silk (natural), this will give stretch/flexibility in a fabric made from the fibres;
- **natural staple** fibres: cotton, wool (and other animal hairs), linen;
- **synthetic staple fibres** are produced by first producing a single filament fibre which is extruded through a spinneret, after which the filament fibres is cut into short lengths ready to be used for further processing; many synthetic fibres can be made into staple yarns by cutting them, lengths may vary;
- **performance characteristics** of staple fibres: shorter, when spun together can produce a 'hairier' yarn, often thicker than filament; not as lustrous as filament as it does not reflect the light, but will absorb light to produce a matt finish.
- **named fabrics** made from staple fibres yarns could include: acrylic tweed; wool twill; cotton gabardine; polyester/cotton gabardine; etc.;
- **performance characteristics** could also include:

- **drape/flexibility** – how the fabric behave when it is worn as an item such as a skirt – it is stiff, floppy, does it move with the body, etc.;
- **comfort/absorbency** – woven fabric which have been made from staple fibre yarns usually are more absorbent that fabrics made from filament yarns – this is due to the staple fibre yarns having more spaces between the fibres so that moisture can go into these spaces; if the fabric is more absorbent, it is more comfortable to wear; this will also depend on what the fabric is made from because some fibres are more absorbent than other e.g. wool is more absorbent than polyester;
- **hard-wearing qualities**: staple fibre yarns usually cause more of the fibre ends to rub together and so produce bobbles on the surface known as 'pills' which are hard to remove; if the fabric is loosely woven, there will be more of these pills on the surface; if the fabric is made from synthetic fibres, they are hard to remove and over time, the fabric becomes rough and not so wearable so will be discarded;
- laundering: fabrics vary as to how they are laundered and this also depends on the fibre content; staple fibre fabrics are easy to launder as are filament fibre fabrics;
- any other relevant point.

[1 mark given for a named fabric; 1 mark for each well compared performance characteristics up to a maximum of 6 marks].

(b) (i) Explain what points would be important in a design specification for a shirt to be worn to work. [5]

Answer could include:

- list of specification points, could include
- e.g. it may have to be a **specific size(s)** – fabric construction
- which **colour (s) -** if logo is needed
- **season** e.g. summer /winter;
- **age group of consumers;**
- **which style features** to include e.g. pockets, seam finishes, top stitching, etc.;
- **which type of fabric** will be used e.g. polyester/cotton poplin as this is hardwearing for workwear;
- which special **fabric finishes** should be included e.g. easycare (less creasing/ease of ironing);which **components** could be included e.g. buttons/zips, thread, etc.;
- any environmental/ethical considerations e.g. will the fabric be from a sustainable source/use of Fair Trade cotton fabric;
- **cost** of item to produce/retail cost;
- any other relevant point.

[1 mark for each well discussed point up to a maximum of 5 marks]

(ii) Give a detailed product specification for a shirt to be worn to work. [5]

Answer could include:

- Product specification to include details for a shirt to be work to work:
- **size of item** e.g. range of sizes for women from size 6–16; for men: small/medium/large or collar size e.g. 14.5 to 18;
- **shape** of item e.g. basic classic shirt style with princess style front shirt for a woman; man's shirt may be a classic style for work, possibly slim fit or extra slim fit according to fashion;
- **style features** e.g. patch pocket on front bodice/shirt front; top stitching visible on right side;
- **thread**: type, colour, thickness, fibre content e.g. polyester thread to match colour of fabric, fine thread count so it is suitable to thread through a standard sewing machine needle;
- **fabric**: weight, fibre content, colour, e.g. polyester cotton poplin in white, medium weight; whether a non-iron option is available;
- **stitching**: size, straight stitch (lock stitch) or other relevant; neatening of raw edges if relevant e.g. straight stitch used throughout for the seam of the shirt construction with raw edges neatened with three-thread overlocking; tolerances allowed in seams
- **decoration/embellishment details:** colour (e.g. white), dye (e.g. none), how to produce the design (no embellishment except 2 rows of top stitching along the edge of the collar and cuffs);
- whether an **embroidered company logo** is to be included, if so what colour thread, is interfacing/strengthening needed on the back before sewing, etc.;
- any other relevant point;

[1 mark for each well discussed point up to a maximum of 5 marks]

(c) Discuss the factors that a manufacturer would need to take into account before producing a batch of shirts to be worn for work. [9]

Answer could include:

- what **labour force** is available; how big the batch is;
- what **training** is needed for the workforce e.g. can all the labour force use all the machines to work the techniques/processes on the shirts;
- what sort of **sewing machines/overlockers** are available e.g. lockstitch machines, overlockers to sew seams or finish edges, embroidery machines (CAM) to produce company logos, buttonhole machines, etc.;
- what **sort of fabric** is needed and where to purchase it from;
- how much **fabric** needs to be bought/according to the size of the batch to be produce;
- what **time scale** the work has to be completed in;
- does the fabric have to be **dyed or embellished** before making up or will this be done as part of the job;
- all the **costs** involved;
- can any parts of the item be **purchased readymade** from a different supplier to save time; quality control checks needed;
- any other relevant points;

High: The answer will include detailed knowledge and understanding in the discussion of the factors involved that a manufacturer would need to take into account before producing a batch of shirts to be worn for work. Relevant detailed examples may be included. [7–9]

Middle: The answer will include some in brief discussion of some of the factors involved that a manufacturer would need to take into account before producing a batch of shirts to be worn for work. Some points may be presented as a list and there may be errors and omissions. Some examples may be included. [3–6]

Low: The answer will include little or no discussion of the factors involved and there will be few if any examples. [0–2]

[Total: 25 marks]