

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
GCE Advanced Subsidiary Level and GCE Advanced Level

**MARK SCHEME for the October/November 2009 question paper
for the guidance of teachers**

9631 DESIGN AND TEXTILES

9631/03

Paper 3, maximum raw mark 100

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Section A

Answer *both* questions.

1 Fitness for purpose is important in the design of specialist clothing.

(a) Outline *four* factors which need to be considered when designing clothing for sportswear.

Answer could include:

- type of sport, whether active when the participant gets hot (e.g. running) or needs clothing which needs to give protection from elements such as rain;
- which time of year, e.g. in cold weather, clothes will need to be insulating as well as moisture absorbing if the person will be getting hot;
- what sort of fabric would be needed, e.g. if flexibility is needed, a stretch jersey fabric, such as cotton jersey, may be more suitable than a firm woven fabric such as cotton gabardine;
- whether fastenings are needed or not – in many cases it would be better to have as few fastenings as possible as they may be unsuitable for the sporting activity;
- how long the fabric needs to last, which is related to costs; if the fabric is to be produced as cheaply as possible, the garment may not be long lasting;
- safety considerations – if the sport is to be carried out at night, a light coloured or very bright fluorescent fabric may be needed;
- whether the fabric should be tight fitting or not in order to be streamlined e.g. swimwear;
- cultural/religious considerations.

Also:

- team sports/colour;
- sizing: loose fit;
- fashion trends;
- comfort;
- target market;
- easy care.

1 mark for each correct well-explained point. No duplicate points.

[4]

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(b) (i) Describe *four* fabric finishes which could be used to enhance the performance characteristics of fabrics for sportswear.

Answer could include:

- **Water repellent finish** – if the fabric is used in the rain (raincoat) or for other outdoor sports (running), a silicone finish applied to the surface of the fabric; this finish may not be permanent as it washes out after time, and can be re-applied after a time if needed; can be used on any fabric;
- **Anti-bacterial finish** – could be used in sports socks and sports shoes made from fabric; this is a chemical finish which is applied to the fabric; can be used on any fabric;
- **Soil release finish** – (such as Scotch Guard) is applied to the surface of the fabric, or can be sprayed, or the fabric can be immersed in the chemical; can be used on any fabric;
- **Anti static finish** – used for fabrics which are prone to a build up of static, such as polyester and nylon; these fabrics are often used for sportswear because they do not absorb too much water; finishes such as Zepel, are applied to the fabric; the finish can also be included in the fibres production process; the anti-static finish can also be applied after laundering;
- other finishes: mildew proofing; brushing; easy-care finishes;
- calendaring – add shine;
- napping – add warmth.

1 mark for each well described point. Give some credit for bleaching/mercerising etc. if relevant points given. [4]

(ii) Assess the effectiveness of *each* fabric finish listed in (i).

Answer could include:

- **Water repellent finish** – would reduce the absorbency of the fabric and would keep the wearer drier in a rain shower; the fabric is still breathable which is important if the wearer is active, as would happen in a sporting activity;
- **Anti-bacterial finish** – imparts a self-sterilising quality to the fabric; the appearance and feel of the fabric are not affected; can be used on any fabric;
- **Soil release finish** – will aid the removal of stains or dirt from fabric; it is effective against water or oil based stains; can be used on any fabrics;
- **Anti static finish** – the fabric (such as nylon/polyester and other synthetics) will not be so prone to clinging, dirt attraction and 'crackling' during wear; can be used on any fabrics.

Any other answer relevant to the finish stated in (i).

1 mark for each well assessed finish.

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(c) Explain the importance of having a detailed design specification for the manufacture of sportswear items. Give specific examples.

Answer could include:

- details of front and back views of garment, so the manufacturer knows what the finished garments look like;
- stitch details such as length of stitch; important so that manufacturer produces identical garments and the machines can be set up exactly (may be done by computer for accuracy);
- details of the fabric to be used – so that when the manufacturer buys in specific fabric for a garment, the performance characteristics will be as described and the consumers will not need to complain;
- appropriate labels – to show size, fibre content – because the manufacturer needs to follow current legislation;
- sizes of garments and seam allowance details – so that the garments fit well for the sport;
- fastenings to be used – exact length of zip (buttons/Velcro etc.) and type of material used e.g. metal/plastic teeth – the manufacturer may buy these components in to make the garments and a detailed specification will ensure that the correct product is bought;
- production methods to be used.

Any other appropriate point, well explained.

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(d) Assess the types of *stitches* and *joins*, which could be used in the production of sportswear. Give specific examples.

Answer could include:

Stitches

- Machine stitches, such as straight stitch used for main seam construction, zig-zag stitch used for neatening seam edges, or for decorative stitching on the right side of the fabric;
- Overlocking stitch, such as three thread or four thread overlocking may be used as an alternative to straight stitch and zig-zag for seam constructions; three thread overlocking is mainly used for neatening and may be used after straight stitching has been done to make a seam; four thread overlocking has an extra line of stitching which gives extra strength and can be used as a seam, without extra straight stitching;
- Stitches may be different according to the fabric used: e.g. if a stretchy jersey fabric is used, a slight zig-zag stitch may be used instead of straight stitch so that the fabric and stitching 'give' or stretch a little and do not snap in wear;
- Buttonhole stitching is made up of zig-zag stitches and the machine may be computer controlled to make identical buttonholes;
- Embroidery stitches may be used by machine to produce logos or lettering; various designs and colours can be stitched at the same time and is usually computer controlled;

Joins

- Joins or seams are used to fix different parts of the garment together; side seams and finishes (examples can be given e.g. plain seam/double-stitched seam, etc.).
- Double stitched seams are strong and may be used on outerwear, to give decoration as well as strength.
- Sleeves can be joined to bodices using plain seams – extra stitching may be used to keep seams flat for comfort.
- Stretch fabrics e.g. sweat shirting – may have an overlocked seam – this will be flexible and will 'give' with the stretch fabric.
- More than one type or colour of fabric may be joined – to give variety to garments, various methods of joining can be used – decorative or non decorative.

Any other appropriate point, well explained.

Answer must include points from both stitches and joins.

[8]

[Total: 25]

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2 There is a wide choice of creative textile techniques.

(a) Compare *four* differences between embroidery carried out

(i) by hand

Answer could include:

- added materials by hand;
- hand embroidery has wide variety of stitches to choose from, e.g. stem stitch, French knots, bullion knots, seeding, etc.;
- more expensive;
- slower and more control in hand embroidery and easy to unpick individual stitches if a mistake has been made;
- more variety of threads can be used by hand, e.g. different thicknesses of stranded cotton, textured threads can be used;
- equipment used by hand: wide variety of needles available for use by hand, sizes e.g. tapestry, crewel, etc., and sizes e.g. ranges from 1 to 10.

(ii) using the sewing machine

- CAD designs;
- more restricted designs – need to be programmed;
- machine – limited to a combination of straight stitch and zig-zag stitch, as most decorative stitching is made up of these stitches;
- machine sews faster and need skill to produce good quality work; it is harder to unpick stitches due to the size and density, although this depends on the stitches chosen;
- limited use of threads – cotton threads (mercerised), polyester, viscose (shiny), mainly due to the fact that the machine needle is a standard size and the eye of the needle limits the thread thickness which can be used;
- equipment – sewing machine has a few attachments which could be used when doing embroidery e.g. darning foot could be used to work free machine stitching/embroidery, where fabric is stretched in a hoop and the machine feet are lowered.

Accept relevant labelled sketches.

1 mark for each well compared point.

[4]

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(b) Explain how the use of different yarns/threads can add variety to hand embroidery.

Answer could include:

- many types of threads available – e.g. tapestry wool is fluffy, thick and has a matt finish; can be used to cover larger areas of fabric because the thread is thicker;
- silky viscose or silk thread can be used to give a shiny texture when carrying out embroidery stitches;
- metallic yarns add lustre;
- stranded cotton can be used for delicate work e.g. one strand or up to 6 strands can be used for a bolder effect;
- mixed coloured yarns;
- knitting wool is useful e.g. double knitting acrylic yarn can be used as an alternative to tapestry wool and is quick to use and needles are easy to thread;
- strips of fine silky fabric can be cut up and used as 'thread' and is particularly successful when stitched into a loosely woven base fabric, e.g. linen canvas;
- fine threads which have beads or sequins attached can be couched onto a background fabric.

Any other relevant point.

Accept labelled diagrams where relevant.

1 mark for each well explained point/example.

[5]

(c) Assess the ways in which free machine stitching can be used to produce interesting surfaces, illustrating your answer with specific examples.

Answer could include:

- different stitches: straight stitch, zig-zag, and embroidery stitches;
- fabric must be placed in an embroidery hoop so that it is tight and hands are placed at the side of the hoop for safety;
- the machine teeth are lowered so that the hoop can move freely when stitching;
- twin needle could be used, two threads threaded through the top of the machine which produces a raised line when stitched; this is achieved because the bobbin thread pulls the two top threads tight producing a ridge;
- small pieces of threads and fabrics can be placed on the surface of the fabric and stitched down using free stitching, to produce an interesting surface;
- the bobbin can have a thick thread wound around it; the tension will need to be loosened and the fabric placed under the machine with right side down, so that the bobbin thread shows on the right side when the fabric is turned over;
- different ways of moving the embroidery hoop will achieve different surfaces, e.g. zig-zag stitches can be sewn in groups to form spots of stitching;
- two or three types of stitching can be used together to form contrasting areas of thick/thin on the fabric;
- top tension can be loosened so that the stitching is loopier on the right side of the fabric;
- two different thicknesses of thread can be used: a thin thread on the top and a thick one in the bobbin, to produce loopy stitches which show on the right side;
- different colours of thread can be used on the top and in the bobbin, to produce a 'mottled' effect.

Any other relevant point.

Accept labelled diagrams where relevant.

1 mark for each well explained point/example.

[8]

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(d) Discuss how textile techniques from different cultures can be used to decorate fashion items.

Answer could include:

e.g. Chinese culture – use of design such as flowers/birds/mountains; silk fabric and threads; colours; hand techniques, etc.

e.g. Indian culture:

- appliqué, kantha and tie and dye are three textile techniques which are often used in the North of India. Kantha is a technique where three layers of fabric are used: there are two layers of cotton cambric with a layer of cotton wadding in between, forming a 'sandwich'; hand stitching, in the form of running stitch then sews the three layers together, producing a pattern at the same time; different colours of thread are used;
- fabrics used, e.g. cotton lawn/cambric often used for all three techniques listed above;
- colours and dyes used e.g. coloured fabrics are often dyed using natural dyes which are available locally; plant dyes produce bright colours such as yellow, blue and orange;
- types of stitches used, no stitches are used for tie and dye, but thread is used to tie certain parts of the fabric where no colour is required; this forms a 'resist';
- appliqué uses the technique where the fabric shapes are cut slightly larger than the finished size, and a small turning/hem is folded inwards and oversewing is used to fasten the appliqué shape onto the background fabric;
- design source used; this will vary but popular designs include animals such as elephants, birds, people, flowers and geometric patterns;
- what the technique is used for/what items are decorated.

e.g. Shibori, Japan – heat set for texture;

- Mola – Kuna women;
- Shisha mirror work;
- Beading Native American.

Any other relevant point.

Accept labelled diagrams where relevant.

1 mark for each well explained point/example.

[8]

[Total: 25]

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Section B

Answer two questions

3 Colour can be used to add interest to designs and textiles.

(a) Outline the theory of colour and colour mixing, to include primary, secondary and tertiary colours.

Answer could include:

- drawing of the colour wheel to help illustrate the points to be made in the answer;
- primary colours: red, yellow and blue, these cannot be mixed from any other colours;
- secondary colours: red and yellow in equal proportions will make orange (secondary);
- yellow and blue in equal proportions will make green (secondary);
- red and blue in equal proportions will make purple (secondary);
- tertiary colours are when one primary and one secondary are mixed together e.g. red (primary) mixed with orange (secondary) will produce an orange red.

Accept labelled diagrams where relevant.

1 mark for each well explained point.

[4]

(b) (i) Design a bag which uses primary and secondary colours in an interesting way. Show the front view and label four design features. Label clearly.

Answer could include:

- any choice of bag design – shopping bag, tote bag, hand bag, school bag, evening bag, sports bag, etc.;
- ways of applying colour could include: dyeing plain fabric using dyes which can be bought by consumers (e.g. Dylon dyes suitable for cotton and linen, or dyes suitable for wool and silk);
- tie and dye using different ways of folding the fabric and then tying with string, thread and elastic bands;
- a resist could be applied directly to the fabric e.g. melted wax, to form a design and the fabric can then be dyed (batik);
- stitching could be used as a resist – and then the fabric can be dyed (tritik);
- design could use the dyed fabric to work appliqué shapes which have been stitched onto a background fabric;
- fabric can have colour effect worked then the bag can be made up;
- the bag could be made up first then the whole thing can be dyed/tie dyed;
- the bag could have a lining inserted and this could be a different fabric/colour to the outside of the bag.

Any other relevant dye technique/process.

Accept labelled diagrams where relevant.

1 mark for each well explained point/example/design.

[4]

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(ii) Explain why the colour scheme chosen in (i) would make the bag attractive to the consumer.

Answer could include:

- colours chosen will depend on current fashions e.g. pink/brown may be fashionable this season, but the colours may be blue and yellow next season;
- a bag which is to be used on a regular basis may need to be made in a dark colour so the dirt does not show up, otherwise the bag will need to be laundered more frequently;
- the design work/colour method on the bag may be suitable for different occasions e.g. floral designs may be suitable for day or evening use, whereas a more random design such as tie and dye, may be more attractive to the teenage market.

Any other relevant point.

Accept labelled diagrams where relevant.

1 mark for each well explained point/example.

[2]

(c) Assess the effectiveness of the following in producing various colour effects, when dyeing fibres, yarns and fabrics.

(i) natural dyestuffs:

Answer could include:

- mainly plant materials are used to produce a range of different colours;
- orange/yellows can be obtained from onion skins, flower petals, various leaves;
- brown/grey can be obtained from walnut shells;
- tea/coffee can produce brown/grey colours;
- curry powder can produce cream/gold colours;
- sweet potato skin (red) can produce green/grey colours;
- herb leaves such as marjoram, mint, parsley can produce various shades of green to yellow;
- plant material must be boiled first to obtain the colour; put leaves/plants etc. into water and boil, then strain and the strained liquid will form the dye;
- mordents needed to fix the colour in the fibre/yarn/fabric; these are chemicals which are applied to the fibres/yarns/fabrics before adding to the dye bath; mordents can be salt, alum, cream of tartar, etc. in small amounts; different colours of dye will be obtained according to the mordant used;
- most fibre content is dyed although polyester may give very pale colours;
- cotton/linen/viscose take dye readily;
- the fibre/yarn/fabric needs to be clean, washed, and then soaked in the mordant; without rinsing off the mordant, the fibre/yarn/fibre is put into the prepared dye bath and left;
- heating will probably be necessary to get stronger colours, so the dye bath can be an old saucepan or other container;
- once dyed, strain away the liquid, rinse the fibres/yarns/fabrics well and leave to dry.

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(ii) **synthetic dyes:**

- availability will vary; Dylon is widely available in a variety of different types;
- powder dyes;
- hand (not machine) dyeing, for wool, and silk; use 'fix' powder to keep colour;
- machine Dylon for cotton, linen and viscose; use with salt to keep colour;
- multi-purpose dye for all fabrics, cold water dye, so useful also for batik, where hot water would melt the wax and spoil design; use with dye 'fix' powder;
- all above are available in wide variety of colours;
- more colours can be achieved by varying the amount of dye used, for example, half a packet of dye will give a paler shade than using a whole packet;
- procion dyes (powder) used with cold water and used on mordanted (pre-prepared fabrics etc.), can be used in small amounts to obtain bright colours; useful for batik work where hot water would melt the wax and spoil the design;
- liquid dyes: these are available and have to be used with a 'fix' to keep the colour;

Advantages of using synthetic dye:

- colour has been tested so can be sure to get same colour as on packet;
- easily available;
- easy to use as clear instructions;
- 'fix' and salt are easily available;
- easy to dye fibres/yarns/fabrics in a bowl/bucket or in the washing machine if using machine dye;
- machine dye will not damage washing machine if instructions are followed;
- examples of use of dyes e.g. tie/dye, batik, etc.

1 mark for each well explained point/example.

[15]

[Total: 25]

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4 (a) Discuss the choice and range of trimmings and additional materials available (other than fabric) to enhance the quality of finished textile products.

Answer could include:

- trimmings could include: ribbons, lace, ric-rac braid, beads/beading, purchased motifs, decorative patches, etc;
- other materials could include: buttons, zips, Velcro, press-studs, buckles, different types of threads, etc.

For each of above, the following points could be considered:

- what fibre content has been used e.g. cotton/silk, polyester etc.;
- the colour(s) available;
- washability/durability;
- ease of sewing on, and whether can be sewn by hand or machine;
- cost of the trimmings;
- whether available in a variety of sizes (e.g. buttons, zips, beads, etc.) for different sizes of garments/household items.

The following points could also be included:

- whether the trimmings are 'in fashion' or not, e.g. current seasons may favour fringing and tassels on cushions, and last season ribbon decoration may have been more popular;
- cost of different types of trimmings, e.g. use of small amount of expensive trimming may be worth spending if item looks more interesting;
- if making one's own clothing/household item, wide choice available and individual items can be made;
- colour schemes can be matched more carefully if choosing ones own trimmings.

Any other appropriate point.

Give credit for labelled diagrams.

1 mark for each well explained point.

[10]

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(b) Assess the ways in which textiles can be recycled, to produce new items. Illustrate your answer with specific examples.

Answer could include:

Types of textiles which could be recycled:

- tops, jackets, skirts, trousers, jumpers; dresses; any other appropriate examples;
- left-over fabric pieces from garment making which are new but are a useful size;
- manufacturers may have useful off-cuts of fabric left after cutting out items;
- trimmings e.g. lace/ribbons/bindings.

Ways to recycle textiles:

- use new fabric pieces to make items e.g. patchwork cushion covers; patchwork bags; bags made from panels of different fabrics;
- fabric pieces can be cut into shapes and used for appliqué;
- small areas of quilting can be done and these can be used as panels for bags/cushions etc.;
- clothing: jeans (e.g. cotton denim) can have pockets and waistband left on and cut off lower half, then re-stitch to make into a bag;
- more than one top could be altered so that a collar from one shirt could be added to the neckline of a different shirt, to make a combined top;
- sleeves of one jacket could be added to a waistcoat to make a 'new' jacket;
- skirts could have godets or inserts from a different fabric;
- accessories can be made from long off cuts of fabric;
- recycled trimmings could be added to decorate/embellish.

Any other appropriate points.

Give credit for labelled diagrams.

1 mark for each well explained point.

[15]

[Total: 25]

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5 A clothing company plans to manufacture a batch of women's jackets.

(a) Explain what is meant by the following and outline the importance of *each* to the clothing company.

(i) market research

Answer could include:

- market research is a way of researching past and current products, as well as new ideas from innovative designers;
- fashion journals,
- questionnaires/surveys;
- style and colour forecast services;
- garments of competitors;
- ranges available in retail stores.

Design concept is developed after research has been done, and is done by drawing/using computer software, to try out different ideas before making patterns.

Market screening may test the market to see what exists in the market already for a target market and what segment of the market the product should be aimed at.

(ii) making and testing a prototype

Making a prototype

- the prototype pattern is created from basic blocks or modelled on a dummy, and takes into account anthropometrics data, in relation to figure types in the market;
- a sample is made up by skilled machinists who test out ways of making the garment from the pattern, to make a good fit.

Importance of market research and making:

- to produce items which will sell and to make profits for the business;
- to make sure the idea works;
- to make sure it fits a range of sizes;
- to be able to write a detailed specification for manufacturing;
- to make alterations if necessary;
- to work out exact costs;
- to be able to specify exactly what type and how much fabric/accessories are needed;
- to assess skills/labour needed;
- to work out what types and how many machines will be needed; etc.

Any other appropriate points.

1 mark for each well explained point.

[10]

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(b) Assess some of the factors which need to be considered when selecting fabrics for the women's jacket.

Answer could include:

- occasion e.g. day or evening wear, different fabrics are appropriate for different occasions;
- climate, season;
- influence of fashion trends e.g. some fabrics more popular than others;
- ease of availability of fabric and where they will be sourced/produced;
- costs involved;
- colours of fabric to be purchased – range or all one colour, costs are reduced if fabric bought in bulk;
- performance characteristics of fabric;
- fabric construction e.g. woven/knitted;
- suitability of fabric for use;
- durability; care/washability;
- ease of sewing;
- special finishes needed e.g. stain resistant finish/easy care/crease resistant finish.

Any other appropriate points.

1 mark for each well explained point.

[7]

(c) Assess the value of using labelling for garments, including the ITCLC Care Labelling system.

Answer could include:

Types of labels which could be assessed:

- e.g. compulsory label (legislation) such as fibre content/flammability etc.;
- information labels e.g. fibre content/blends, washing instructions; name of brand/store; special finishes label e.g. 'non iron';
- swing labels e.g. indicating the use of 'Lycra';
- label with size of garment.

Value of the labels:

- information to help consumer choose item when shopping, e.g. fibre content, size;
- correct care so that garment does not deteriorate too quickly.

Value of ITCLC:

- specific symbols so information is global;
- wash tub temperatures/amount of agitation;
- visual symbols – international and do not need words;
- drying instructions – tumble, line dry/drip dry etc.;
- dry cleaning symbols – specific chemicals for different fabrics;
- bleaching instructions;
- ironing temperatures so fabric is not scorched;

Any other appropriate points.

1 mark for each well assessed point.

[8]

[Total: 25]