

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

**MARK SCHEME for the October/November 2010 question paper  
for the guidance of teachers**

**9631 DESIGN AND TEXTILES**

**9631/01**

Paper 1, maximum raw mark 75

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### Section A

#### 1 Non-woven textiles are widely used.

##### (a) Outline the basic principles of constructing the following non-woven fabrics:

###### (i) thermo-bonded fabrics

answer could include:

webs or batts of man-made fibres (or man-made with cellulose) such as thermoplastic polypropylene or other fibres such as polyester are used; the web or batt is hot calendered and binder thermoplastic fibres or polyester powders act as adhesives to produce the fabric.

1 mark for each correct point

[2]

###### (ii) felt fabrics

answer could include:

animal fibres such as wool are made into a web and the scaly surface of the fibres can matt together with the addition of heat, soap, moisture and agitation; the fibres will shrink and produce a thick fabric; (could include reference to Milling or Fulling process).

felt may be made from a blend of other fibres such as wool with polyester, acrylic, viscose, Kumar felt.

1 mark for each well explained point, up to 2 marks

[2]

##### (b) Name *two* fibres which are often used in the production of non-woven fabrics, giving one reason for *each* choice.

answer could include:

polyester or polypropylene – thermoplastic so will melt easily with heat – easy to stick together;

nylon – similar to polyester;

micro fibres;

viscose – cotton-like but cheaper so a good choice if absorbency is needed;

acrylic or modacrylic – similar to wool but softer and can soften with heat so good for thermo-bonding/non allergic so good for childrens slippers etc.;

thermo-bonded fabrics used for interlinings, fabrics used for filters, upholstery fabrics.

Accept cotton – limited use for industrial items (reference: Technology of Textile Properties, Taylor pages 144–146); need to give a reason e.g. waste cotton fibres used therefore economical.

wool – main use in carpets.

Thermoplastic synthetics 60% used in non-wovens;

30% manufactured cellulosic used in non-wovens;

10% natural and other fibres used in non-wovens;

animal fibres: easy to felt with heat/soap/agitation, due to scaly surface of fibres which attaches to other fibres;

reasons to relate to the example given: e.g. hardwearing fabric due to polyester content; polypropylene fabrics very lightweight; felt fabrics for accessories can be brightly coloured and do not fray; interesting shapes can be cut and stitched easily due non-fraying nature of felt; waste wool fibres can be used.

1 mark for each well explained point, up to 4 marks

[4]

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**(c) Compare the construction of non-woven fabrics with woven fabrics.**

answer could include:

non-wovens use **fibres only**, whereas woven fabrics are made from yarns (twisted and sized), two sets (warp and weft threads); interlacing;  
 fibres in non-wovens can be in random order or could be carded and laid in lengthways direction (depending on type of non-woven);  
 dry laid web formation (staple fibres) could be: parallel-laid; cross laid; air laid;  
 wet laid web formation (staple fibres) also used (similar to paper making);  
 spun laid (fabrics) filament fibres used due to continuous process;  
 perforated drums/rollers used;  
 fabrics tend to be thick and stiff;  
 fabrics do not fray and usually no grain or selvedge;

web then held together – various methods used e.g. adhesive spray/bonding agent or thermo-bonding or spun lacing;  
 meltblown – filaments of molten fibres are extruded and then thermally bonded;  
 needle punching fibres are tangled which holds batt together;  
 woven fabrics have a wide variety of weaves (e.g. plain weave: over one, under one threads repeated); twill weave has variations base on a four thread pattern; satin weave; sateen weave; other weaves e.g. pile (velvet);  
 usually have a selvedge and a specified width depending on the size of loom used;  
 fabrics are flexible (especially on true cross 45 degrees); non-wovens not flexible; can be thick or thin;  
 weft insertion by air, water or shuttle;

1 mark for each well explained point, up to 6 marks. reference needs to be made to both woven and non-woven fabrics. [6]

**(d) Discuss the choice and performance characteristics of non-woven fabrics available for the following uses:**

- (i) clothing e.g. interfacing**
- (ii) accessories e.g. shoes**
- (iii) household e.g. bedding**
- (iv) medical e.g. face masks**

answer could include:

properties depend on type and thickness of fibres, how thick the batt is and how the bonding has been carried out; Bondaweb;

- (i) handle and drape not as easy to achieve as with woven fabrics (can be stiff); hard for fabrics to drape around the body; keeps its shape; used for Vilene interfacing – variety of weights added to garment to give weight/stiffness or softness in different areas e.g. cuffs/collars; interlinings to give warmth; polyester wadding for padding/warmth for quilting; weak fabric;**

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- (ii) extensively used for footwear e.g. trainers (outside and inside); chosen by those who do not wish to use animal products; washable so more hygienic than leather shoes; slippers for adults and children for warmth/washability but not always very durable; specialist sports related properties e.g. absorb shock for runners; can be very durable if properties or thickness is altered. Felt used for slippers – warm/durable/lots colours/can be washed if care taken;
- (iii) other performance characteristics such as strength (tend to be weaker than woven fabrics so can be used as disposable fabrics); can be highly absorbent (will depend on fibre content); mattress covers; pillow covers – washable and can be produced to repel dust mites for allergy sufferers; cleaning cloths often made from non-wovens – e.g. J-cloths – washable so hygienic, disposable due to low cost; polyester wadding e.g. washable/lightweight/warm/insulating; can flatten after many uses;
- (iv) non-toxic; non-allergic; non-linting of surface; no fraying; hygienic – can be used once and thrown away due to low cost; medi-wipes; make-up remover cloths; babies nappies; feminine hygiene products; plasters; etc all are used once so very hygienic; durability not needed if only used once. Comfortable against skin e.g. smooth surface; may have anti-bacterial finish.

types of non-wovens:

parallel laid used for interlinings and J-cloths;

cross laid used for interlinings;

air-laid used for lightweight fabrics; garments;

meltblown fabrics for insulation wadding, clothing;

needle punched used for fabrics e.g. shoe linings;

stitch bonding used for blinds, carpet backing, medical products;

non-woven fabrics can be used in producing moulded shapes (e.g. mouth covers in medical uses);

1 mark for each well explained point, up to 11 marks.

High band: 8–11

Middle band: 4–7

Low band: 0–3

[11]

[Total: 25]

## 2 Synthetic fibres and fabrics are continually being developed.

### (a) Briefly outline the basic principles used in the production of synthetic fibres.

answer could include:

chemicals (and raw materials such as wood pulp/cotton linters);

wet; dry and melt spinning used to produce synthetic fibres;

wet spinning – polymers are combined (depending on fibre being produced) and spinnerette is immersed inside a coagulating bath e.g. viscose;

dry spinning – polymer dissolved in solvent, fibre produced when extruded through spinnerette and warm air blown over fibres e.g. acetate;

melt spinning – polymer is combined and extruded through spinnerette, fibre hardens and cold air blown over fibres;

1 mark for each well explained point, up to 4 marks.

[4]

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**(b) Compare the performance characteristics of *one* named synthetic fabric with *one* named natural fabric.**

answer could include:

possible synthetic fibres: polyamide (nylon); polyester; acrylic; modacrylic; (any other appropriate choice);

possible natural fibres: cotton, linen, silk, wool; ((any other appropriate choice));

performance characteristics could include:

strength; e.g. polyamide and polyester very strong compared with natural fibres (cotton, linen and silk fabrics are strong, wool is moderately strong).

resistance to abrasion;

comfort; e.g. polyamide and polyester absorb very little moisture

(polyester 0.5% polyamide 4%) so are not comfortable to wear compared with natural fibres which are more absorbent (e.g. cotton 6-8%, linen 12% wool 16%, silk 10%);

extensibility and elasticity (elastic recovery); polyamide, and wool have very good elastic recovery, silk and polyester are also good, with cotton the least compared with the previous fibres; fabrics made from the fibres which have good elastic recovery are likely to crease the least;

shrinkage; e.g. synthetic fibres are likely to be heat set which will eliminate shrinkage, fibres such as cotton and wool are likely to shrink;

ease of care: (including method of cleaning (washing/dry cleaning), resistance to chemicals and effect of heat (washing/ironing temperatures); e.g. most fibres are easy to launder although wool and silk need careful handling;

flammability: polyamide and polyester are likely to melt and drip due to thermoplasticity but some types may be flame-proof; cotton and linen burn readily, silk and wool smoulder and self extinguish;

drape: fine fibres drape more readily, so the type of construction will determine how a fabric will drape; polyamide, polyester and silk drape well, cotton less so;

lustre: polyester, polyamide and silk have greater lustre than cotton and linen;

thermal insulation;

effect of static: evident under dry conditions, therefore fibres with low moisture absorbency such as polyamide and polyester are more likely to suffer from static than fibres with higher moisture absorbency such as cotton or wool;

Give some credit for one fibre even if other fibre is not correct.

1 mark for each well compared point, up to 8 marks.

[8]

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**(c) Discuss the range of regenerated cellulose fibres for use in clothing.**

answer could include:

fibres include: viscose; acetate; triacetate; Lyocell; etc.;

widely used: made from natural source (wood) with added chemicals; biodegradable and more environmentally friendly than other 'manmade' fibres;

properties of viscose/Lyocell are very similar to cotton and linen fibres and fabrics; low strength and low durability; take dyes well and can be colourful, whether dyed or printed; absorbent; comfortable to wear; crease badly and can stretch in the laundering process (washing with reduced action; iron using warm or cool temperature);

acetate and triacetate are much more like synthetic fibres and fabrics; they are thermoplastic; they are lustrous and have good drape; they can have silk like qualities and are cheaper to produce than silk; they are susceptible to damage from heat and a cool iron needs to be used, and laundering with care;

types of clothing made from cellulose – dresses, tops, blouses, ties. Dressing gowns; linings for coats and jackets;

1 mark for each well explained point, up to 4 marks.

[6]

**(d) Assess the new developments in fibre and fabric technology, (e.g. Smart fabrics), giving specific examples in your answer.**

answer could include:

environmentally friendly fibres – developments in viscose – type fabrics which use natural raw materials which are renewable, with some chemicals e.g. Lyocell – a generic name for solvent spun cellulose fibre with 'cotton-like' properties;

'Tencel' is one type of Lyocell made by Courtaulds: details include – fibres can be lustrous or matt finish, moisture regain is 11%, it can be blended with other fibres, it has good strength and dyes readily;

bamboo fibres; micro-fibres; salmon skin fabrics; pineapple fibres;

smart fabrics e.g. fibres/fabrics which re-act with the environment/in use

nano technology added to textiles

Modacrylics – inherently flame retardant e.g. Teklan

Aramid (Nomex/Kevlar) used for highly flame retardant fabrics so used for fireman and racing drivers uniforms; also used in aircraft furnishings; Kevlar used in bulletproof vests;

Elastane e.g. Spandex is very elastic – can stretch up to 700% stretch, used in blends with other fibres for foundation wear/tights, swimwear etc.;

Chlorofibre – PVC polymer, used to produce novelty fabrics, is warm, non flammable and resistant to chemicals – e.g. used for protective clothing;

Goretex;

bikini with energy from sunlight to power mp3 player;

spider silk;

recycled fibres used for new fabrics e.g. Polartec;

organic cotton;

microencapsulation;

Neoprene used in scuba diving wear.

Accept reference to CAD software for designs on fabrics.

Give 1 mark if just a list or names is given.

[7]

**[Total: 25]**

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## SECTION B

### 3 Design principles are carefully considered in garment design.

- (a) (i) Explain what is meant by shape, line and proportion in relation to fashion designing.

answer could include:

body/silhouette **shape** could be used to illustrate the use of shape, line and proportion;  
**shape** – could refer to the silhouette shape of womens clothing, e.g. A line, balloon, straight, flared, gored skirts etc.; dresses: tunic, shirt style, etc.; sleeves: fitted, puff, angel style, etc.; or any other suitable shapes, whether on whole items or parts of items;  
 horizontal lines emphasize width; vertical lines emphasise height;  
 (accept shape could refer to patterns combined together to make designs on fabrics e.g. prints).

**line** – eye travels along lines when used on textile designs and items; indicates position and direction; there can be something to focus on at the end of the line; either side of the line can have area of focus; line thickness e.g. belts on clothing can be used to emphasise areas of the body; lines can be broken/ shaped e.g. zig-zag/curved/etc.; groups of lines can be used e.g. parallel lines on clothing/ accessories/etc.;

**proportion** - proportion can be used to divide up areas of design; can be used in combination with line to add interest; eye can focus on a particular place and the area may be divided up in different proportions e.g. one third/two thirds/or different ratios; on an item of clothing, e.g. dress, the top section can be a one third proportion and the skirt section could be two thirds proportion; it can be varied by having one section plain, and the other patterned; this adds to variety;  
 symmetrical/assymetrical garments or design details for garments;  
 any other suitable points/examples;

1 mark for each well explained point.

[3]

- (ii) Sketch and label **three dresses for a special occasion which illustrate the use of shape, line and proportion. (You may use the silhouette provided at the end of the question paper.)**

answer could include:

illustrations related to the examples given in (i);

well labelled, showing use of **line** (e.g. stripes/dress with princess seams showing line; dress made up of different sections/use of different fabrics) – seam join will show line;

**proportion** – different size of bodice and skirt sections; use of different fabrics; one section emphasised more than another by use of top stitching or belt or band of fabric etc.;

garment may be symmetrical or assymetrical e.g. both sides of garment are the same or one side may have shoulder detail and other may not;

**shape** can relate to overall shape of the dress: A-line/straight/bell skirt/puff ball skirt/etc.; needs to be labelled correctly; darts and seams to emphasize body curves; shape related to design on fabric and overall shape or garment;

**shape/line/proportion must be labelled on each sketch to gain marks;**

1 mark for each well labelled point, up to 9 marks;

[9]

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- (b) In contemporary fashion, discuss how fashion designers use shape, line and proportion in their designs. Give specific examples to illustrate your answer.**

answer could include:

specific examples from fashion designers – e.g. 2008 season, this will depend on the choice of fashion designers studied; accept local designers as long as they are named;

line and shape feature in womens silhouettes – line: in the form of asymmetrical seams on skirts/pleats found on tops and dresses e.g.

Jean Paul Gaultier – use of stripes on tops; fitted to the body;

DKNY – gathered short skirts with line (join) at hip level; emphasis on hip area;

Dolce and Gabbana – line used in the form of checks/tartan fabric for tops and shirts;

Vivienne Westwood – line used in the form of checked fabrics pieces together to form skirts and jackets; jackets are fitted to the body;

Donna Karan – soft line around neck on draped tops/dresses; long straight shape;

Stella McCartney – high waists (line/join) on dresses used with gathers (vertical line); long straight slightly flared shape;

Giles – padded curves used on edges of jackets;

Prada – proportion used to have contrasting fabrics on straight dresses;

Burberry;

answer needs to include the assessment of the importance of shape, line and proportion, with specific examples of the fashion designers studied; this will depend on the dates/seasons studied and any suitable fashion designers can be included in the answer;

reference to trends in popular/contemporary fashion magazines e.g. Vogue, Elle, Harper's Bazaar and named retail outlets.

Include reference to accessories e.g. bags/belts etc.

1 mark for each well explained and assessed point;

High band: 10–13 marks

Middle band: 5–9

Low band: 0–4

[13]

[Total: 25]

**OR**

**4 Garment production is carried out in a variety of ways.**

- (a) Explain what is meant by:**

**(i) a prototype**

**(ii) 'one-off' production**

answer could include:

prototype: a trial item/sample made from cheap fabric (usually); the design will be based on fashion sketches and may need to be modified/alterd which is why cheap fabric is used; the item may be made using a paper template, or modelled on a dummy; fit, length, sizing, may need to be altered; details such as pockets, decoration (position) may be changed once the item is made up; the construction process may be altered, if the design is too complicated to be made up, especially if the item is to be made in quantity later; e.g. jacket;

any other suitable points, well explained.

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One person may make whole garment;

'one-off' production: an item is made but it is not expected to produce more than one; this means the item can be more complicated to construct/decorate and will be more costly; the item may be for an individual client/customer or designed for catwalk show; several fittings may be carried out to get a very good fit; there may be more decoration than normal and it may have more hand sewing/finishing; e.g. wedding/evening dress;

any other suitable points, well explained.

1 mark for each point

[4]

**(b) Compare the use of the following processes in 'one-off' garment production:**

**(i) hand processes**

**(ii) machine processes**

answer could include:

- (i)** hand processes would be suitable for one off items due to individual work and the customer may have chosen how the detail is to be stitched/position on the garment; if the decoration has been attached, it can be checked by the client before continuing, to make sure the requirements are correct for the customer;  
expensive process as skill needed;  
could include: hand embroidery; sewing on beads/sequins/lace; attaching ribbon in an interesting way e.g. curved lines to look like flowers;  
hand stitched hems which is more time consuming but can give a smooth almost invisible finish both on right and wrong side of garment;  
addition of components such as buttons/motifs/and items which are more difficult to machine e.g. hook and eye;  
discussion needs to include examples and well explained; diagrams should be given credit when well labelled;  
machine is more accurate when programmed;
- (ii)** machine processes: a skilled machinist would be needed to carry out the work; each item will be different and may well have a range of different processes, e.g. different seam construction; different fabric which may be slippery to handle; there may well be more time allowed to produce the item because it is likely that the client will want a good fit/get the item exactly to requirements rather than want the item immediately; different machines may need to be used e.g. straight stitch/overlocker/buttonholer, so an experienced machinist would be essential, especially if the fabric is expensive; mistakes would need to be avoided;

any other suitable points, well discussed; examples to be included;

High band: 6–8 marks

Middle band: 3–5

Low band: 0–2

[8]

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- (c) Assess the range of neckline openings which can be used in garment production. Include specific examples on a variety of garments, in your answer.

answer could include:

types of openings:

necklines: e.g. bound, faced, collars can be added to openings;

openings can have fastenings attached e.g. zips (different methods of insertion e.g. concealed, semi-concealed, invisible, visible/decorative, etc.); buttons and buttonholes (different types e.g. hand-stitched, machined, bound), velcro, ties, ribbons;

openings on jackets: e.g. facing with lapel which could be single or double-breasted and have buttons/press studs/etc.;

different types of garments e.g. skirts, tops, jackets, nightwear, children's wear; trousers, dresses, etc.;

discussion to include an assessment of the range and suitability of openings; labelled sketches can be included;

1 mark for each well discussed point.

High band: 10–13 marks

Middle band: 5–9

Low band: 0–4

[13]

[Total: 25]