



General Certificate of Education

**AS Design and Technology
Product Design 5551**

PD1T Materials and Components

Mark Scheme

2008 examination – June series

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

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Quality of Written Communication

The following marks are allocated to the quality of the candidate's written communication. Make a separate assessment of the candidate's overall ability as demonstrated across the paper using the criteria given below.

<i>Performance Criteria</i>	Marks
The candidate will express complex ideas extremely clearly and fluently. Sentences and paragraphs will follow on from one another smoothly and logically. Arguments will be consistently relevant and well structured. There will be few, if any, errors of grammar, punctuation and spelling.	4
The candidate will express moderately complex ideas clearly and reasonably fluently, through well-linked sentences and paragraphs. Arguments will be generally relevant and well structured. There may be occasional errors of grammar, punctuation and spelling.	3
The candidate will express straightforward ideas clearly, if not always fluently. Sentences and paragraphs may not always be well connected. Arguments may sometimes stray from the point or be weakly presented. There may be some errors of grammar, punctuation and spelling, but not such as to suggest a weakness in these areas.	2
The candidate will express simple ideas clearly, but may be imprecise and awkward in dealing with complex or subtle concepts. Arguments may be of doubtful relevance or obscurely presented. Errors in grammar, punctuation and spelling may be noticeable and intrusive, suggesting weaknesses in these areas.	1

This mark scheme is intended as a guide to the type of answer expected but is not intended to be exhaustive or prescriptive. If candidates offer other answers which are equally valid **they must be given full credit.**

Many responses at this level are assessed according to the **quality** of the work rather than the number of points included. The following level descriptors are intended to be a guide when assessing the quality of a candidate's response.

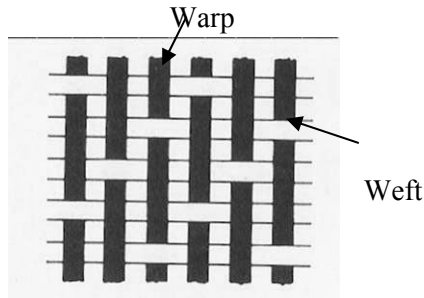
(low mark range)
The candidate has a basic but possibly confused grasp of the issues. Few correct examples are given to illustrate points made. This candidate does not have a clear idea of what s/he is writing about.
(mid mark range)
The candidate has some knowledge but there will be less clarity of understanding. Some correct examples given to illustrate points made. This candidate knows what s/he is writing about but is confused in part.
(high mark range)
The candidate has a thorough understanding of the issues and has provided relevant examples to support the knowledge shown. This candidate knows what s/he is writing about and provides clear evidence of understanding.

- 1 (a) (i) Candidate may respond through an annotated diagram and/or written description.

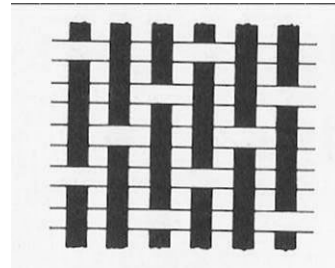
Twill weave: weft yarns pass over 3 then under 1 warp yarns (1 mark), moving forward one yarn on each row (1 mark),

to give a diagonal line (1 mark). Other twill weaves acceptable.

An accurate diagram incorporating all points, and clearly identifying warp and weft above will be acceptable for 3 marks.



(3 marks)



(2 marks)

(3 marks)

- 1 (a) (ii) e.g. Reference should be made to fibre content and fabric structure, e.g. washable, hardwearing, strong, even when wet, resistant to abrasion, cool to wear, absorbent, flexible, not harmed by many solvents, paints etc, 'solid' structure, relatively inexpensive.

Marks awarded as follows:

- Little understanding, simplistic statements only, candidate typically concentrates on limited fibre qualities without reference to structure of the fabric or intended use. 0 - 2 marks
- Candidate may show understanding of the contribution made by at least one aspect of the fabric structure but most points will relate to fibre content. There will be a sound attempt to analyse appropriateness of fabric for overalls but a good description of fibre properties may be awarded some marks in this band. 3 - 5 marks
- Candidate shows sophisticated understanding of the contribution made by several aspects of the fabric structure and fibre content in relation to overalls. 6 - 7 marks (7 marks)

- 1 (a) (iii) Hot wash (60°) for cotton , helps remove dirt and stains, fabric strength allows maximum agitation to remove dirt, hot iron for cotton removes creases, do not bleach or colour will be removed, may be dry cleaned.

Marks awarded as follows:

- Minimal explanation which does not clearly relate to qualities of fabric used for the overalls to the care advised. The candidate will tend to explain what the symbols mean and there may be elements of misunderstanding and confusion. 0 - 2 marks
- Detailed explanation of what the symbols mean together with clear explanation of how the advice relates to the qualities of the fabric used for the overalls. Information will be accurate and clearly presented. 3 - 4 marks (4) marks

- 1 (b) (i) Candidate may respond through an annotated diagram and/or written description.

Web of fibres built up to required thickness (1 mark),

web subjected to heat and pressure (1 mark),

fibre surfaces soften and are fused together (1 mark).

3 points, 1 mark each (3 marks)

- 1 (b) (ii) e.g. polyester is thermoplastic (1 mark), low absorbency (1 mark) so does not absorb water-based stains (1 mark), and dries quickly (1 mark), strong fibre withstands abrasion/ripping (1 mark), Durable (1 mark), lightweight (1 mark), cheap enough for disposal (1 mark), resistant to acids, alkalis and solvents (1 mark), smooth filaments which do not trap air so cool (1 mark), could be washed if needed (1 mark), not bulky so easy to wear (1 mark).

Any 6 points, 1 mark each (6 marks)

- 1 (c) (i) Zip is quick to apply, buttons and buttonholes take longer (1 mark),
saves time which makes manufacture quicker/cheaper (1 mark),
zip is quicker to fasten and undo, buttons take longer (1 mark),
buttons concealed with flap so safer/stay cleaner (1 mark),
zip seals overalls completely, buttons leave gaps (1 mark),
zip may be damaged during wear so becomes unusable (1 mark).
- Buttons and buttonholes might tear non-woven fabric/cotton fabric is stronger for buttonholes (1 mark).

Any 4 points, 1 mark each

(4 marks)

- 1 (c) (ii) **White overalls:**
e.g. hood protects hair from paint/dust (1 mark),
elastic at ends of sleeves, pants and hood gives snug fit (1 mark),
elastic at ends of sleeves and legs is safer (1 mark),
elastic waist allows fit for different sizes (1 mark),
- Blue overalls:**
Side openings allow access to pockets in clothes beneath (1 mark),
cuffs give snug fit but allow sleeves to be rolled up (1 mark),
useful pocket (1 mark),
drawstrings at end of pants allow for adjustment/close fit (1 mark),
collar protects neck/allows for loose fit/strengthens neckline (1 mark).

Any 5 points, at least two for each garment, 1 mark each

(5 marks)

1 (d) **White overalls:**

e.g. non-woven production is quicker as there is no need to convert fibres to yarns so cuts down on manufacturing processes and energy use, white fabric reduces needs for dyes which can pollute, no laundering required so no pollution from detergents or 'dirty' effluent from soiling, no energy used for cleaning, polyester fibre comes from petrochemicals/non-renewable source, not bio-degradable, used coverup may be sent to landfill where it will remain for a long time.

Blue overalls:

Cotton fabric and garment manufacture are strong enough to be used many times so less waste, can be washed to extend life, but laundering uses energy and may result in 'dirty' water entering sewage systems, use more energy in manufacture of fabric and garment, made from cotton – crops cause environmental damage, blue dye may cause pollution.

Marks awarded as follows:

- Basic information with evidence of only limited knowledge and understanding of environmental issues. Candidate will give only superficial reasons for the environmental damage caused by the overalls and may refer mainly to one pair only. There will typically be comments about the manufacture of non-woven fabrics and possibly a lack of specific problems related to the environment. Information will be generalised rather than specific and there will be evidence of misunderstanding. 0 - 2 marks
- Candidate shows knowledge of the different problems caused and will relate specifically to the overalls, although there may be a lack of specific information. There will be a tendency to relate to a narrow area of environmental concern. At the top end, there will typically be good coverage of one area of concern, e.g. dyeing or pesticides. There may be elements of confusion and inappropriateness. 3 - 5 marks
- Candidate shows detailed knowledge and understanding of the environmental problems and relates specifically and accurately to the overalls. There will be a range of varied points with clear explanation of the issues involved. 6 - 8 marks (8 marks)

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- 2 (a) (i) Short lengths of fibre (1 mark)
- 2 (a) (ii) Curled/crinkled appearance (1 mark)
- 2 (a) (iii) Staple fibre: gives hairy appearance (1 mark), adds softness (1 mark), traps air to give warmth (1 mark), may irritate skin (1 mark).
Crimp: traps air for warmth (1 mark), adds soft handle (1 mark), gives resilience/stretch (1 mark), fabrics are crease resistant (1 mark).
- Any 6 points, (at least 2 for each feature) 1 mark each (6 marks)**
- 2 (b) (i) Wool contains natural grease/lanolin (1 mark), which can repel surface water droplets (1 mark). (2 marks)
- 2 (b) (ii) Absorbency gives fabrics next-to-skin comfort (1 mark), wool is able to absorb 30% moisture without feeling wet (1 mark), this and natural water repellency is ideal for outdoor wear (1 mark), damp wool able to generate heat (1 mark), wet wool is heavy and uncomfortable/takes a long time to dry (1 mark) naturally stain repellent (1 mark), high moisture content makes fabrics non-static (1 mark), so they do not cling (1 mark).
- Any 4 points, 1 mark each (4 marks)**
- 2 (c) (i) e.g. the scales on the fibres (1 mark), interlock (1 mark), in the presence of heat, moisture, and friction (1 mark), causing shrinkage/loss of texture (1 mark), so cool wash necessary (1 mark), do not machine wash unless treated for shrinkage (1 mark), no tumble dry to avoid shrinkage (1 mark). High absorbency makes wet fabrics very heavy (1 mark), so must be dried flat to avoid distortion (1 mark). Wool is a protein fibre (1 mark), so will be damaged/broken down by biological detergents (1 mark) is damaged by alkalis such as found in detergents (1 mark).
- Any 8 points, 1 mark each (8 marks)**
- 2 (c) (ii) The ability of the scales to interlock (1 mark), is used in the production of felt (1 mark), a dense/matted fabric (1 mark), with no grain (1 mark).
- Any 3 points, 1 mark each (3 marks)**
- 2 (d) This is a quality mark (1 mark). indicates 100%/pure new wool (1 mark), must be verified by Wool Board (1 mark), some cheaper wools (1 mark), made from inferior wools (1 mark)
- Any 3 points, 1 mark each (3 marks)**
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- 3 (a) Candidate may respond through a diagram and/or written description
Tie dye is a resist method of dyeing; sections of fabric are tied or knotted to give a random pattern, then immersed in dye. It is possible to produce a variety of patterns and many colours can be used by re-tying and over dyeing. A time consuming method, best suited to small lengths of fabric, because of this, it is not suited to commercial production although similar effects can be created through printing

Marks awarded as follows:

- Simplistic statements describing method or effect, candidate typically concentrates on pattern issues with little evaluation for commercial production. 0 - 2 marks
- Candidate clearly describes a number of methods and effects in detail, with sound evaluation of commercial viability. 3 - 4 marks (4 marks)

- 3 (b) Candidate may respond through a diagram and/or written description
Screen printing can be both small and large scale. In its simplest form, a screen has sections blocked off areas to form the pattern. Dye paste is pushed through the sections of the screen not blocked off. When done by hand, it can be difficult to achieve a good result as the screens have to be aligned precisely to ensure accuracy of pattern.

A similar method may be used in industry, often designs are transferred to screens by computer with a separate screen for each colour in the pattern. This method can be both expensive and time consuming, so rotary screen printing is preferred for large runs.

In rotary screen printing the dye paste is put on the fabric from within a metal roller, with a separate roller for each colour in the pattern. The rotary rollers may have the pattern engraved on them using a laser to ensure greater accuracy. Although an expensive method for small runs, it is a very fast method of printing.

Marks awarded as follows:

- Simplistic statements describing method or effect, candidate typically concentrates craft processes with little evaluation for commercial production. 0 - 2 marks
- Candidate clearly describes method(s) and effects with some detail, including one which is used in industry, but with only scant references to the commercial viability of the method. Some appropriate examples given. 3 - 5 marks
- Candidate shows sophisticated knowledge and understanding and gives a range of appropriate examples. There is clear description of craft and commercial methods, including the use of ICT, with sound evaluation of commercial viability. 6 - 8 marks (8 marks)

- 3 (c) Candidate may respond through a diagram and/or written description
Quilting is a 'sandwich' of different fabrics; usually the top layer is a fashion fabric, the middle a layer of wadding, and a lower lining/inside layer. These layers are stitched together in a pattern.

Quilted fabrics have a textured effect and may be embellished with embroidery or beads to give a decorative effect, or may be a more functional fabric used for applications such as warm coats or bedding.

More sophisticated forms of quilting, e.g. Trapunto, allow for more intricate patterns to be produced.

Quilting may be a craft process or used for commercially produced fabrics. Stitch patterns produced industrially using computer controlled machines to ensure accuracy and speed up process.

Marks awarded as follows:

- Simplistic statements describing method or effect, candidate typically concentrates craft processes with little evaluation for commercial production. 0 - 2 marks
- Candidate clearly describes method(s) and effects with some detail, including one which is used in industry, but with only scant references to the commercial viability of the method or for smaller scale production using hand quilting. Some appropriate examples given. 3 - 5 marks
- Candidate shows sophisticated knowledge and understanding and gives a range of appropriate examples. There is clear description of craft and commercial methods, including the use of ICT, with sound evaluation of commercial viability or for smaller scale production using hand quilting. 6 - 8 marks (8 marks)

- 3 (d) There are many different types of embroidery, which can be done by hand or machine. It can add colour, pattern and texture to a fabric. Different types of thread, beads and sequins, and stitches can be used.

Hand embroidery is very time consuming and labour intensive but gives unique results. Free machine embroidery is faster and produces interesting results on larger areas of fabric.

Commercially produced embroidery tends to be designed and applied to fabric using computer technology. Some commercially produced fabrics are embroidered overseas where workers are skilled in their craft and are paid considerably less for their work.

Marks awarded as follows:

- Simplistic statements describing method or effect, candidate typically concentrates craft processes with little evaluation for commercial production. 0 - 2 marks
- Candidate clearly describes method(s) and effects with some detail, including one which is used in industry, but with only scant references to the commercial viability of the method. Some appropriate examples given. 3 - 5 marks
- Candidate shows sophisticated knowledge and understanding and gives a range of appropriate examples. There is clear description of craft and commercial methods, including the use of ICT, with sound evaluation of commercial viability. 6 - 8 marks (8 marks)

- 4 (a) Interfacings are available in many weights and a limited range of colours such as black, white and grey. They may be woven, e.g. canvas, non-woven, e.g. Vilene, or knitted. They can be iron on or sew-in.

Interfacings:

- reinforce and strengthen sections of a garment, e.g. collars, cuffs, button/buttonhole bands
- may be used to prevent stretching or sagging, e.g. waistbands, collar bands, patch pockets
- can prevent a fabric from fraying, e.g. behind buttonholes and welt pockets
- help prevent a fabric from creasing too much, e.g. collars
- give shape, e.g. collars, lapels
- add weight, e.g. hemlines
- add crispness/stiffen a fabric, e.g. collars, cuffs
- give support, e.g. behind embroidery

When selecting interfacings the following should be considered: colour, weight, care compatible with top fabric, method of application suited to fabric, whether or not the top fabric needs to retain stretch.

Marks awarded as follows:

- Basic information with evidence of only limited knowledge and understanding of the reasons for using interfacings. Candidate will give only superficial reasons for their use and the factors determining their selection. The response will tend to concentrate on non-wovens with few examples of type or use. Information will be generalised rather than specific and there will be evidence of misunderstanding. 0 - 3 marks
- Candidate shows limited knowledge of the different types of interfacing but will be reasonably knowledgeable about reasons for use and will give a number of examples although there may be a lack of specific information about factors affecting choice. At the top end, there will typically be detailed coverage of one type/use of interfacing with more generalised coverage of other uses. There may be some elements of confusion and inappropriateness at the lower end. 4 - 7 marks
- Candidate shows detailed knowledge and understanding of the types, choice and use of interfacings and provides a range of relevant examples to illustrate points made. 8 – 10 marks (10 marks)

- 4 (b) A lining is a separate layer of fabric used in textile products, e.g. jackets, trousers, skirts, dresses, curtains, cushions. The fabric used needs to be compatible with the top fabric in terms of colour, weight and care. Lining fabrics are usually slippery and include satins and sateens, plain weaves and taffeta, typically made from polyester, silk, acetate and cuprammonium rayons, and cotton.

Lining adds strength, covers construction details, gives a high quality finish, may allow for inner pockets on a garment, adds a decorative feature, could make construction quicker and possibly cheaper as it avoids need to finish edges, improves drape, adds warmth, helps a product keep its shape, and protects the outer fabric- e.g. from sunlight, perspiration, rubbing and staining.

Marks awarded as follows:

- Little understanding, simplistic statements only, candidate offers limited reasons for use of lining and response may well be confined to limited range of items.
Scant consideration will be given to lining fabrics and factors affecting choice. 0 - 3 marks
- Candidate shows limited knowledge of the different types of lining but will be reasonably knowledgeable about reasons for use and will give a number of examples. There will typically be a lack of specific information about factors affecting choice. At the top end, there will typically be detailed coverage of one type/use of lining with more generalised coverage of other uses. There may be some elements of confusion and inappropriateness at the lower end. 4 - 7 marks
- Candidate shows sophisticated knowledge and understanding of the purposes of across a range of fashion and household products. There will be information about fabric types and factors affecting choice. Information will be accurate and relevant. 8 - 10marks (10 marks)

- 4 (c) e.g. safety considerations, weight of trim appropriate for fabric, compatible with care needed for fabric, aesthetic considerations, cost/ease of application, fashion issues, availability of trimming, cost of trim in relation to expected selling price, type and use of product.

Reference to different trimmings, e.g. sequins, beads, motifs, ribbons and braids, bindings, lace, buttons, threads as used on men's and women's formal evening garments.

Marks awarded as follows:

- Little understanding of issues related to choice, simplistic statements only. Candidate typically concentrates on fashion issues with few examples given. Will tend to describe trimmings and some typical uses. 1 - 2 marks
- Candidate shows understanding of the issues to be considered but in limited ways only. Some parts of the response will be descriptive of a range of trimmings but there will tend to be sound attempts to evaluate their use on garments. Some appropriate examples given. 3 - 5 marks
- Candidate shows sophisticated understanding of issues to be considered and is able to give a range of appropriate examples of both trimmings and uses. 6 - 8 marks (8 marks)

Question 1:		40 marks
Question 2:	28 marks	
Question 3:	28 marks	
Question 4:	28 marks	
2 questions 28 marks each		56 marks
Quality of written communication		4 marks
Paper Total:		100 marks