



General Certificate of Education

**AS Design and Technology:
Product Design 5551**

PD1T Materials and Components

Mark Scheme

2007 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.

Question 1

- 1(a) (i) This question is about use of fabric, **not** components, style details or fibre/fabric properties.
eg the use of toning colours (1 mark), description of colour contrast (1 mark),
with varied textures, (1 mark), such as satin/chenille/velvet (1 mark),
lustre/matt (1 mark), ‘soft’/’hard’ (1 mark) or crisp and slippery (1 mark),
with co-ordinating embroidery (1 mark),
contrast of plain and pattern (1 mark), different weights (1 mark).
Any five points, 1 mark each *(5 marks)*
- (b) eg cotton has short lengths (1 mark), polyester is continuous length (1 mark),
Candidates must show understanding that **either**:
the polyester has to be cut into staple form before being mixed with the cotton fibres
and spun into a yarn
or: the polyester may be used as core filament with cotton spun round core to form a sheath,
Up to 3 marks for an explanation of either process. *(5 marks)*
- (c) (i) eg silk is luxurious, soft, adds lustre, warm, strong, absorbent.
But it is expensive, very difficult to care for, damaged by perspiration.

Marks awarded as follows:

- Candidate shows little understanding of the properties of silk and there will be little analysis of its suitability for the throw. There will be some confused and inaccurate points. 1-2 marks
 - Candidate shows knowledge of the properties of silk and attempts to analyse its suitability for the throw. Although mostly accurate, points will be limited in range. 3-4 marks
 - Candidate shows sophisticated understanding of the properties of silk and its appropriateness for the throw. Information will be accurate and there will be evidence of true evaluation. 5-6 marks *(6 marks)*
- (ii) eg Throw is made up of a ‘sandwich’ or made up of layers with silk fabric on outsides (1 mark), wadding in middle (1 mark).
Wadding traps air (1 mark), which insulates (1 mark).
Four points, 1 mark each *(4 marks)*

- (d)(i) eg directional pile is a raised surface (1 mark), usually along the fabric length (1 mark), knitted or woven into a fabric (1 mark), use of 3 yarns (1 mark) appears to be different colours when viewed from different directions or feels rougher when brushed one way (1 mark).
Any 3 points, 1 mark each *(3 marks)*
- (ii) eg Cushion pieces must face same direction to avoid colour differences (1 mark), use of differential feed when stitching (1 mark), to avoid top layer of fabric 'walking' along lower layer (1 mark), sharp scissors to avoid damage (1 mark), use of fine needle to avoid snagging of satin (1 mark), use of zip foot when inserting piping (1 mark), use of needleboard when pressing (1 mark), do not flatten pile (1 mark), avoid excessive heat when pressing (1 mark).
Any 5 points, 1 mark each *(5 marks)*
- (e) eg piping, zip, embroidery threads, shisha mirrors, sewing thread.
2 marks for reasons for choice of each component selected.
2 components, 2 marks each
NB No mark for just naming component *(2 × 2 marks)*
- (f)(i) Plain woven fabric (1 mark), made with highly twisted yarns (1 mark), 'open' / mesh / fine weave (1 mark), gives transparent effect (1 mark).
Any 3 points, 1 mark each *(3 marks)*
- (ii) eg voile is lightweight and transparent, polyester is easy care, unaffected by sunlight and flame retardant. But the voile is transparent so privacy may be compromised and it will not effectively block light.

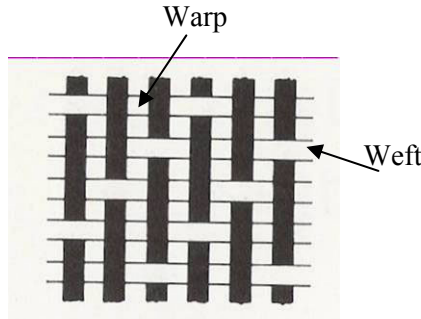
Marks awarded as follows:

- Candidate shows some understanding of the properties of voile but will concentrate on fabric at expense of fibre content. Response will tend to concentrate on fashion aspects and there may be some confused and inaccurate points. 1-2 marks
- Candidate shows sound understanding of the properties of voile and polyester as used for this application. Information will be accurate and there will be evidence of true evaluation 3-5 marks *(5 marks)*

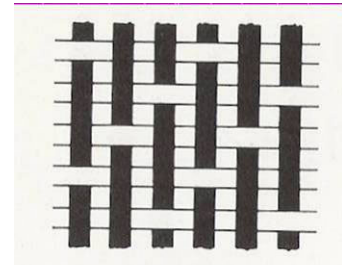
(40 marks)

Question 2

- (a)(i) Candidate may respond through an annotated diagram and/or written description.
Twill weave with weft yarns passing over 3 then under 1 warp yarns, moving forward one yarn on each row, to give a diagonal line.



(4 marks)



(2 marks)

An accurate diagram/description is awarded 4 marks, less accurate information may be awarded 1/2 marks provided that there is some evidence of knowledge of basic structure.

(4 marks)

- (ii) eg Coloured warp threads (1 mark), arranged in loom as required (1 mark), white weft weaves in and out (1 mark).

(3 marks)

- (iii) eg use of bleach (1 mark), use of enzymes (1 mark) removes colour in random pattern (1 mark), or other appropriate response, not 'stonewash'.

2 points, 1 mark each

(2 marks)

- (b) **Fabric must resist wear and tear.**
eg cotton is hardwearing and strong, but tears relatively easily.
Twill weave is strong but frays easily.

Marks awarded as follows

- Little knowledge or understanding of properties of cotton or twill weave in relation to resisting wear and tear. Will give some accurate qualities of cotton but will not explain contribution made by twill weave, or there may be positive points only.
There may be inaccuracies and information will not be related to specified end use. 1-2 marks
- Sound knowledge of properties of cotton and twill weave in relation to wear and tear. There will be accurate information related to end use and a balance of negative and positive points.. 3-4 marks

Fabric must be easy to care for.

eg cotton is strong and even stronger when wet and can withstand harsh treatment during washing so does not require special care. Can be washed at high temperatures without being damaged, ironed with a hot iron without burning/melting. Cotton is not affected by alkalis so does not need special detergents. Twill weave is strong and stable.
But cotton fabrics shrink badly unless given a finish, creases badly and need to be ironed with a hot iron, is very absorbent so takes a long time to dry.

Marks awarded as follows

- Little knowledge or understanding of properties of cotton or twill weave in relation to care. Will give some accurate positive qualities of cotton but will overlook negative aspects. There may be inaccuracies and information will not be related to specified end use.
May give positive points only. 1-2 marks
- Sound knowledge of properties of cotton and twill weave in relation to wear and tear. There will be accurate information related to end use and a balance of negative and positive points. 3-4 marks

Fabric must be comfortable to wear.

eg cotton is absorbent and does not irritate skin, is cool to wear.
Twill weave can be rough and not always very flexible.

Marks awarded as follows

- Little knowledge or understanding of properties of cotton or twill weave in relation to comfort in wear. Will give some accurate qualities of cotton but will not explain contribution made by twill weave. There may be inaccuracies and information will not be related to specified end use. 1-2 marks
- Sound knowledge of properties of cotton and twill weave in relation to comfort in wear. There will be accurate information related to end use and a balance of negative and positive points.. 3-4 marks

3 specification criteria, 4 marks each

(3 × 4 marks)

- (c) eg cut on cross, to make pocket which contrasts with main part of garment.
eg cut garments with panels with stripe going in different directions.
eg use of pleating to change visual impact of stripe pattern.

Marks awarded as follows

- Uninspiring designs which do not fully utilise effect of stripe pattern. Ideas may be for similar garments with only minor differences shown. Poor quality sketches which do not show detail clearly. 1-2 marks
- Sound designs which show different uses of stripes but do not exploit fabric pattern. There is some attempt at originality but designs will tend to be 'safe'. Sketches and notes are adequate but some details may not be clear. 3-5 marks
- Original and different designs which exploit nature of stripe pattern. Notes and sketches are high quality and easy to understand. 6-7 marks

(7 marks)

(28 marks)

Question 3

- (a) (i) eg **Gore-tex** used for outdoor wear, sportswear, tents, bags, shoes. Based on a membrane system which forms an impenetrable layer to the elements. The fabric is waterproof and breathable. Candidate may use a diagram to show how fabric works.
- (ii) eg **Polar** fleece used for casual and sportswear, blankets/throws. Often used as insulating layer. Knitted and brushed polyester fleece is lightweight and insulating, dries quickly, is soft and can wick moisture from body.
- (iii) eg **Tactel microfibre** used for fashionwear, tights, ski and outdoor wear. Tactel is a high quality polyamide. Microfibres are 60× finer than human hair. Tactel microfibre produces fabrics that are very soft, drape well, exceptionally strong, light, breathable and resist moisture.

Marks awarded as follows for (i) – (iii):

- Little understanding, simplistic statements only, candidate lacks knowledge of the nature of the fabric and how it works. There will be inaccurate and confused information. Will tend to concentrate on examples. 1-2 marks
 - Candidate shows good understanding of the nature of the fabric and how it works but will lack precise knowledge. There may be some minor areas of confusion but there will be an appropriate range of realistic examples made. 3-5 marks
 - Sound and detailed knowledge shown, candidate will give accurate information with examples. Need to show knowledge of defining features as underlined in (i) to (iii). 6-7 marks
3 fabrics, 7 marks each *(3 × 7 marks)*
- (b) (i) Smart textiles can react /change automatically to their surroundings. 2 marks for correct definition *(2 marks)*
- (ii) eg fabrics which change colour with different temperatures, memory textiles, body monitors, wearable electronics, medical textiles.

Marks awarded as follows:

- Candidate shows some knowledge of an appropriate smart textile but most points will relate to use. There will be some confused and inaccurate points, e.g. reference to micro-encapsulation. 1-2 marks
- Candidate shows sophisticated understanding of a smart textile and may include aspects of the fabric structure and fibre content. The application will be appropriate and described clearly and accurately. 3-5 marks *(5 marks)*

(28 marks)

Question 4

Candidate may respond through a written explanation and/or labelled diagram(s) which include all the points.

- (a) **Selvedge** is the ‘finished’ edge (not ‘finished off’ as in ‘neatened’) of fabric (1 mark), formed on long edges of fabric (1 mark), where weft threads emerge/turn (1 mark), does not fray (1 mark).
Raw edge is unfinished / cut edge (1 mark), and frays (1 mark).
6 points, 1 mark each *(6 marks)*

- (b) **Warp knit** uses several yarns simultaneously (1 mark), yarns interlock from side to side (1 mark), vertically along the length of the fabric (1 mark).
Weft knit uses one continuous yarn (1 mark), horizontal rows of loops (1 mark), interlock with those in the row above and below (1 mark).
Diagrams are acceptable – look for points given above.
6 points, 1 mark each *(6 marks)*

- (c) **Felted fabrics** made from wool fibres (1 mark), scales on fibres (1 mark), lock together (1 mark), in presence of friction and moisture (1 mark).
Bonded fabrics formed from a web/layers of fibres (1 mark), held together with resin/adhesive/heat-setting, or stitching (max 2, 1 mark each).
Any 6 points, 1 mark each.
Must be at least two points about each fabric *(6 marks)*

- (d) **Lining** is inside layer of garment (1 mark), smooth slippery fabric (1 mark), reasons for use –up to 2 (1 mark each), is visible on inside of garment (1 mark), is stitched in place (1 mark).
Interfacing between outer and lining fabrics (1 mark), not seen (1 mark), often ironed on (1 mark), reasons for use –up to 2 points (1 mark each).
Any 6 points, 1 mark each.
Must be three points about each fabric *(6 marks)*

- (e) **Bias binding** is cut on the cross (1 mark), used to finish edges (1 mark), long edges of binding usually pressed under to finish them (1 mark).
Ribbon is on straight grain (1 mark), long edges finished off as it is woven (1 mark), usually has a lustre (1 mark), typical use (1 mark).
Any 4 points, 1 mark each.
Must be two points about each. *(4 marks)*

(28 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