A-level

DESIGN AND TECHNOLOGY: FASHION AND TEXTILES 7562/1

Paper 1 Technical Principles

Mark scheme

June 2023

Version: 1.0 Final

236A7562/1/MS

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' 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.

Further copies of this mark scheme are available from aqa.org.uk

Level of response marking instructions

Level of response mark schemes are broken down into levels, each of which has a descriptor. The descriptor for the level shows the average performance for the level. There are marks in each level.

Before you apply the mark scheme to a student's answer read through the answer and annotate it (as instructed) to show the qualities that are being looked for. You can then apply the mark scheme.

Step 1 Determine a level

Start at the lowest level of the mark scheme and use it as a ladder to see whether the answer meets the descriptor for that level. The descriptor for the level indicates the different qualities that might be seen in the student's answer for that level. If it meets the lowest level then go to the next one and decide if it meets this level, and so on, until you have a match between the level descriptor and the answer. With practice and familiarity you will find that for better answers you will be able to quickly skip through the lower levels of the mark scheme.

When assigning a level you should look at the overall quality of the answer and not look to pick holes in small and specific parts of the answer where the student has not performed quite as well as the rest. If the answer covers different aspects of different levels of the mark scheme you should use a best fit approach for defining the level and then use the variability of the response to help decide the mark within the level, ie if the response is predominantly level 3 with a small amount of level 4 material it would be placed in level 3 but be awarded a mark near the top of the level because of the level 4 content.

Step 2 Determine a mark

Once you have assigned a level you need to decide on the mark. The descriptors on how to allocate marks can help with this. The exemplar materials used during standardisation will help. There will be an answer in the standardising materials which will correspond with each level of the mark scheme. This answer will have been awarded a mark by the Lead Examiner. You can compare the student's answer with the example to determine if it is the same standard, better or worse than the example. You can then use this to allocate a mark for the answer based on the Lead Examiner's mark on the example.

You may well need to read back through the answer as you apply the mark scheme to clarify points and assure yourself that the level and the mark are appropriate.

Indicative content in the mark scheme is provided as a guide for examiners. It is not intended to be exhaustive and you must credit other valid points. Students do not have to cover all of the points mentioned in the Indicative content to reach the highest level of the mark scheme.

An answer which contains nothing of relevance to the question must be awarded no marks.

Glossary for maths

If a student uses a method which is not explicitly covered by the mark scheme the same principles of marking should be applied. Credit should be given to any valid methods. Examiners should seek advice from their senior examiner if in any doubt.

[a, b]	Accept values between a and b inclusive.
For π	Accept values in the range [3.14, 3.142]
Their	Accept an answer from the candidate if it has been inaccurately calculated but is subsequently used in a further stage of the question.

Questions which do not ask students to show working

As a general principle, a correct response is awarded full marks.

Qu	Part	Marking Guidance	Total marks	AO
01	**1**	Describe the **structure** of twill weave fabric. **Indicative content** **Twill weave fabric:** • weft yarns travel across the width of the fabric • warp yarns travels the length of the fabric/fixed in the loom • weft yarns run over and under warp yarns at regular intervals eg 2/2, 2/1 • interlacing of the yarns moves along one/is offset on subsequent rows • raised diagonal lines are created on the surface of the fabric. Award any other valid responses. Students may include diagrams to explain their answer, accept a plan drawing. Award a maximum of 2 marks for a correct diagram with no labels. Accept 2/2 or any other twill structure. This question is about the *structure* of twill weave fabric, and not its properties. 1 mark per correct point up to a maximum of 3 marks.	**3 marks**	AO4 1a

Qu	Part	Marking Guidance	Total marks	AO
01	**2**	Describe the **structure** of weft knitted fabric. **Indicative content** **Weft knitted fabric:** • one yarn is used • courses travel across the width of the fabric • loops travelling the vertical length of the fabric are called a wale • each horizontal row interlocks with the previous row • creating a looped structure. Award any other valid responses. Students may include diagrams to explain their answer. Award a maximum of 2 marks for a correct diagram with no labels; additional information is required for more marks. 1 mark per correct point up to a maximum of 3 marks.	**3 marks**	AO4 1a

<table>
<tr><th>Qu</th><th>Part</th><th>Marking Guidance</th><th>Total marks</th><th>AO</th></tr>
<tr><td>Ct w</td><td></td><td></td><td></td><td></td></tr>
<tr><td>02</td><td></td><td>Explain how smart materials can improve the performance of sportswear.

You should include specific examples of smart materials in your answer.

<table>
<tr><td>5–6 marks</td><td>Detailed explanation of how smart materials can improve the performance of sportswear. The response is perceptive and demonstrates an in-depth understanding of a range of smart materials, with largely accurate explanations of how they might benefit sportswear. Specific smart materials are described and the information about these different types of materials are correct. There may be a slight lack of detail or understanding at the low end of the mark band, but this does not detract from a thorough response as a whole.</td></tr>
<tr><td>3–4 marks</td><td>Good explanation of how smart materials can improve the performance of sportswear. The response is explained with some detail and demonstrates a good understanding of some smart materials, and how they might benefit sportswear. Some specific smart materials are described and the information about the different types of materials are mostly correct. There may be a slight lack of detail or some misunderstanding at the low end of the mark band, but the content of the response as a whole is generally good.</td></tr>
<tr><td>1–2 marks</td><td>Basic explanation of how smart materials can improve the performance of sportswear. The response is limited in its scope and demonstrates little understanding of smart materials, and how they might benefit sportswear. Few or no specific smart materials are described and the information about the different types of smart materials are limited or incorrect. There is a lack of detail in general, and at the low end of the mark band the information presented is confused and includes inaccuracies, showing a lack of understanding.</td></tr>
<tr><td>0 marks</td><td>No response or nothing worthy of credit.</td></tr>
</table>
</td><td>6 marks</td><td>AO4 1c</td></tr>
</table>

		Indicative content • **Phase change materials** – PCMs have the ability to change from solid to a softer state, allowing heat to transfer away from the body. Outlast® for example, traps wax in microcapsules in the fabric, as the skin gets hot, the heat is absorbed into the soft wax, allowing it to escape. This keeps the wearer at an optimal temperature, improving comfort. • **Stomatex®** – is a breathable neoprene material, that keeps the wearer dry and regulates body temperature. Domed chambers on the fabric surface trap warm air from the body and release this air through tiny pores in the chamber at a controlled rate. Stomatex® flexes with movement and reacts with the users' level of physical activity. • **Thermochromic** – this material can change colour in response to high temperature. Materials are impregnated with liquid crystal; and in response to changes in temperature, change colour alerting the wearer to possible overheating. • **Photochromic dyes** – responds to UV light by changing colour, to visually warm the wearer the light levels are potentially dangerous. • **Fastskin®** – inspired by biomimetics, this material imitates the skin texture of a shark, the varying ridges knitted into the fabric respond to movement. Made for swimwear, the wearer becomes more streamlined in water. • **Nanotechnology** – self-cleaning fabrics have been developed that react to sunlight, degrading organic matter when exposed to light. These materials keep clean and fresher for longer. • **Photoluminescence** – material that absorbs UV or daylight and re-emits in the dark as a light source. • **Corpo Nove shirt** – a prototype product woven with titanium. Creases in the fabric are released in the presence of heat, allowing the garment to return to its original shape. Do not accept microencapsulated, Coolmax®, Gore-tex®. Award any other valid responses		

Qu	Part	Marking Guidance	Total marks	AO
03		Special effect metallic threads can be added to fabrics at different stages of production. Give **two different** ways metallic threads can be added to fabrics. **Indicative content** • Metallic threads can be **spun into the yarn** at the spinning stage. • They can be **woven** into the fabric structure. • Yarns which incorporate a metallic thread can be **knitted** into a fabric. • They can be **stitched or embroidered** onto the fabric surface. Award any other valid responses. 1 mark per correct point up to a maximum of 2 marks.	**2 marks**	AO4 1b

<table>
<tr><th>Qu</th><th>Part</th><th>Marking Guidance</th><th>Total marks</th><th>AO</th></tr>
<tr><td>04</td><td></td><td>A retailer has different offers on garments as shown in Table 1.
Table 1
<table>
<tr><th>Garment</th><th>Normal Price</th><th>Sale offer</th></tr>
<tr><td>Budget</td><td>£17.99</td><td>$\frac{1}{5}$ off</td></tr>
<tr><td>Luxury</td><td>£24.50</td><td>40% off</td></tr>
</table>
Which garment is cheaper in the sale?
You must show your working.
<table>
<tr><td>Budget
$\frac{17.99}{5}$
or
17.99 – 3.598
or
14.39
or
3.6(0)</td><td>1 mark (M)</td></tr>
<tr><td>Luxury
24.50 × 0.6
or
14.7(0)
or
9.8(0)</td><td>1 mark (M)</td></tr>
</table></td><td>3 marks</td><td>AO4 1c</td></tr>
</table>

		Budget garment (£14.39) **and** £14.70 and £14.39 seen — 1 mark (A)		
Qu	**Part**	**Marking Guidance**	**Total marks**	**AO**

05 | | Describe a range of different garment manufacturing systems that meet the demand for fast changes in fashion. | **9 marks** | AO4 1b

7–9 marks	Detailed description of different garment manufacturing systems used in fashion production. In this mark band, there is a wide range of correctly explained systems, which are relevant and meet the demand for fast changes in fashion. The information given is accurate, demonstrating a clear understanding of the different types of systems and the student has related these to the demand for fast changes in fashion. There may be a slight lack of detail at the low end of the mark band, but the information is generally correct and does not detract from the quality of the response.
4–6 marks	Good description of different garment manufacturing systems used in fashion production. In this mark band a few systems are explained, which are generally appropriate and meet the demand for fast changes in fashion. The information given is mostly accurate, demonstrating some understanding of the different types of systems, and the student may have attempted to relate these to the demand for fast changes in fashion. There is likely to be a lack of detail at the low end of the mark band, but the information given is mostly correct.
1–3 marks	Basic description of different garment manufacturing systems used in fashion production. In this mark band, there is a limited range of systems, which are not always appropriate or meet the demand for fast changes in fashion. The information lacks accuracy, demonstrating little or no understanding of the different types of systems, and there is limited awareness of the relationship to the demand for fast changes in fashion. There is a lack of understanding at the low end of the mark band, with some confusion and inaccuracies.
0 marks	No response or nothing worthy of credit.

Indicative content

- **QRM** – Quick response manufacturing systems. These focus on **rapid design and manufacture** of garments, **shortening lead times** so that products reach stores quickly to meet demands for fashion trends.
- **PPC** – Planning, production and control systems are concerned with **planning and controlling all aspects of manufacturing**. This includes scheduling machines and processes, tracking products, and coordinating stock levels with supply chains to **ensure efficient and smooth production**.
- **JIT** – Just in Time systems allow manufacturers **to order fabrics and components as needed**. Stock does not need to be kept,

		therefore manufacturers have flexibility to order in as required, according to changes in trends. • **Batch production** – is a **flexible manufacturing system that accommodates short batches** of products. Manufacturers can **respond to sales feedback and increase or decrease** the number of products made, adapting to changes in fashion. • **EPOS/EDI** – Electronic point of sale provides **automated communication between manufacturer and retailer**. Through the use of barcode/RFID technology, **stock levels are automatically adjusted** to meet changes in sales information. • **Vertical in-house production** – high street retailers do their **own designing, manufacturing and distribution** their products. This allows **lead times to be reduced significantly** so fashion ranges reach stores quickly. • **UPS** – unit production systems provide **uninterrupted workflow** via an overhead system to move garments quickly through the factory. Products are tracked and move smoothly **improving efficiency in manufacturing**. • **Sub-assembly** – a **separate line of manufacture for parts of garments alongside the main line**. Sub assembly is an efficient system, allowing many parts of the garment to be made at the same time, **significantly speeding up** the production rate. • **CAM** – computer-controlled manufacturing is used to control a **number of automated processes** involved in fashion manufacture. This automated system **ensures improved speed and efficiency** throughout the manufacturing process to meet set targets. Award any other valid responses.		

Qu	Part	Marking Guidance	Total marks	AO
06		Name **two** inorganic fibres. **Indicative content** Any two correct points from the following: • carbon • ceramic • glass • metallic. Award any other valid responses. 1 mark per correct point up to a maximum of 2 marks.	**2 marks**	AO4 1a

Qu	Part	Marking Guidance	Total marks	AO
07		Outline the role of the British Standards Institute (BSI). **Indicative content** • The BSI is a national body that **sets standards or technical requirements** for a wide range of fashion and textile materials and products. • The BSI **do not** make or enforce laws. • BSI **test samples and products** to ensure they meet British or European standards. • Products that meet the requirements are awarded a **Kitemark**. • The BSI provide a system of **graphic symbols** seen on care labels. • They provide **safety or fire warning labels** on nightwear, commercial or home furnishings. Award any other valid responses. 1 mark per correct point up to a maximum of 3 marks.	**3 marks**	AO4 1a

<table>
<tr><th>Qu</th><th>Part</th><th>Marking Guidance</th><th>Total marks</th><th>AO</th></tr>
<tr><td>08</td><td></td><td>Explain how the properties of fabrics can be modified by applying a range of chemical finishes.

In your answer, you should refer to specific chemical finishes.

<table>
<tr><td>9–12 marks</td><td>Detailed awareness and understanding of how fabric properties can be modified by applying chemical finishes. There is a wide range of different finishes, along with accurate explanations how the properties of fabric can change in response to application of the chemical finishes. At the top end of the mark band there will be references to specific named finishes that show an insightful understanding. There may be a slight lack of detail at the low end of the mark band, but this will not detract from a fairly comprehensive response.</td></tr>
<tr><td>5–8 marks</td><td>Good awareness and understanding of how fabric properties can be modified by applying chemical finishes. There is a range of different finishes, along with some explanations how the properties of fabric can change in response to application of the chemical finishes. At the top end of the mark band there may be references to specific named finishes. There may be a lack of detail at the low end of the mark band, with some inaccuracies or lack of understanding, but this does not detract from a generally good response.</td></tr>
<tr><td>1–4 marks</td><td>Basic awareness and understanding of how fabric properties can be modified by applying chemical finishes. There is a limited range of different finishes, which are fairly narrow in scope, but shows a limited understanding. A few explanations how the properties of fabric can change in response to application of the chemical finishes are given, but these may lack accuracy and detail. There may be confused information at the low end of the mark band and little or no understanding of how fabric properties can be modified.</td></tr>
<tr><td>0 marks</td><td>No response or nothing worthy of credit.</td></tr>
</table>
</td><td>12 marks</td><td>AO4 1b</td></tr>
</table>

		Indicative content • **Mercerisation** – the surface of a fabric can be modified to add strength, lustre and absorbency. Cotton fibres or yarns are treated with caustic soda which swell up and become better at absorbing dyes. • **Flame retardancy** – a flame retardant finish such as Proban® and Pyrovatex® prevents the fabric from setting on fire. Cellulosic and wool fibres are treated with a spray-finish which slows down the rate of burning, especially on cellulosic fabrics. • **Water resistance** – these finishes alter the properties of fabrics by making them resistant to water-borne and oil stains, for example Teflon® coating which creates an invisible barrier on the fabric surface. • **Crease resistance/non-iron** – Fabric is passed through synthetic liquid resin and heated to make the fabric have easy-care properties. Especially useful for cotton, linen and viscose fabrics which are prone to creasing. • **Shrink resistance/anti-felting** – Cellulosic and wool fibres are susceptible to shrinking as they absorb water and shorten in length. Fabrics are passed through resins, then cured to prevent them from shrinking while being laundered. • **Moth proofing** – Wool fabrics are impregnated with chemicals that are repellent to grubs, which prevent the moths from creating holes in fabrics. • **Anti-pilling** – these finishes use polymers or solvents which form a film on the fabric or by using enzymes to remove short fibres from the surface of fabrics. This creates a smooth and soft fabric surface. • **Hygienic/sanitised finish** – Antimicrobial finishes can be added to the spinning solution for synthetic fabrics or impregnated to other fabrics to inhibit the growth of bacteria. Fabrics remain hygienic to keep garments fresher for longer. Award any other valid responses.		

<table>
<tr><th>Qu</th><th>Part</th><th>Marking Guidance</th><th>Total marks</th><th>AO</th></tr>
<tr><td>09</td><td></td><td>Manufacturers need to comply with Health and Safety laws.

Analyse and evaluate how the Health and Safety at Work Act (1974) impacts on the manufacturers of fashion and textiles products.

<table>
<tr><td>7–9 marks</td><td>Detailed analysis and evaluation how the Health and Safety at Work Act (1974) impacts on manufacturers of fashion and textiles products. There is an accurate level of information, points made are accurate and show an understanding of the issues. In this mark band, there will be a range of positive and negative points, not necessarily in equal balance, but the information is relevant and is connected to the impact for the manufacturers of textile products.</td></tr>
<tr><td>4–6 marks</td><td>Good analysis and evaluation how the Health and Safety at Work Act (1974) impacts on manufacturers of fashion and textiles products. There is a good level of information, points made are fairly accurate and show some understanding of the issues. In this mark band, there are some positive and negative points, with more emphasis on the content of the Act, and less of an evaluation. The information is mostly relevant and connected to the impact for textile manufacturers.</td></tr>
<tr><td>1–3 marks</td><td>Basic analysis and evaluation how the Health and Safety at Work Act (1974) impacts on manufacturers of fashion and textiles products. There is a weak level of information, points made are somewhat inaccurate and show a lack of understanding of the issues. In this mark band, there will be a limited range of points, these are likely to focus on the positive issues, with little if any reference to the negative. The information is weak and is not necessarily connected to the impact for textile manufacturers.</td></tr>
<tr><td>0 marks</td><td>No response or nothing worthy of credit.</td></tr>
</table>
</td><td>9 marks</td><td>AO3 2a
AO3 2b</td></tr>
</table>

		Indicative content • Employers must ensure that the workplace **meets the requirements** of the Health and Safety at work Act 1974, which provides a safe place of environment to work in. For example, providing emergency stop buttons and guards on dangerous machinery. • The Act makes employers **criminally liable** for failure to meet regulations. • It set up the **Health and Safety Executive** (HSE) which is responsible for checking that the Act is being followed. HSE and local authority inspectors visit workplaces to ensure the regulations are being followed, or they react to reports of breaches of the regulations. • It gives **employees the right to be represented** on health and safety issues. • It places an obligation on employees to use **safety equipment** such as PPE. • The Act requires manufacturers to carry out **risk assessments**, identifying potential hazards in the workplace and taking action to eliminate or reduce the hazard. • Manufacturers must appoint a **competent person** to oversee all health and safety issues. • They must ensure staff and employees are properly **trained**. **Evaluation/impact** • Making sure the Health and Safety at work Act is followed is **costly** for manufacturers, both in terms of **time** and **money**. • Employees must be **trained** and gain certification from recognised companies, this will take the employee **away from their workplace** and incur **training costs**. • **Procedures must be followed** to exact specifications, otherwise manufactures could be **breaking the law**. • All incidents must be **recorded** and assessed, failure to show an accident book at an inspection could result in **costly fines**. • All **safety requirements** must be implemented, machines checked regularly and stock replenished to **prevent accidents and incidents**. • Manufacturers must keep up to date with **changing** regulations, and ensure they are implemented **as required by law**. Award any other valid responses.		

<table>
<tr><th>Qu</th><th>Part</th><th>Marking Guidance</th><th>Total marks</th><th>AO</th></tr>
<tr><td>10</td><td>1</td><td>A jeans manufacturer carries out a survey to investigate the probability of producing faulty jeans.

The relative frequency of faulty jeans was calculated and the results are plotted on the graph in Figure 1.

How many of the first 3000 jeans tested were faulty?

Show your working.

<table>
<tr><td>Correct reading from the scale in the range 0.035 – 0.037 seen</td><td>1 mark</td></tr>
<tr><td>108

or

[105 – 111]</td><td>1 mark</td></tr>
</table>
</td><td>2 marks</td><td>AO4 1c</td></tr>
</table>

<table>
<tr><th>Qu</th><th>Part</th><th>Marking Guidance</th><th>Total marks</th><th>AO</th></tr>
<tr><td>10</td><td>2</td><td>Estimate the probability that one pair of jeans, selected at random, will be faulty.

Show your working.

Give a clear reason for your answer.

<table>
<tr><td>Probability:

0.046

or

their [0.045, 0.047]

or

(their) 4.6%

or

(their) 46/1000

or

(their) 23/500

or

(their) 230/5000</td><td>1 mark</td></tr>
<tr><td>Reason:

all data used (5000 jeans)

or

the number of jeans tested was the total number of jeans (5000)</td><td>1 mark</td></tr>
</table>
</td><td>2 marks</td><td>AO4 1c</td></tr>
</table>

<table>
<tr><th>Qu</th><th>Part</th><th>Marking Guidance</th><th>Total marks</th><th>AO</th></tr>
<tr><td>11</td><td></td><td>Compare and contrast the environmental impact of wool, silk and hair fibres with synthetic fibres.

In your answer, you should refer to:

• the sources of raw material
• processing
• care and maintenance
• disposal.

<table>
<tr><td>9–12 marks</td><td>Detailed comparison of the environmental impact of wool, silk and hair fibres with synthetic fibres. A wide range of points are discussed, that relate to all four areas – sourcing, processing, care and disposal. The information given is mostly accurate and points made are relevant to the issues. There may be slightly less detail in one or more of the four areas, however there is a clear contrast between natural and synthetic fibres and a detailed understanding of their environmental impact.</td></tr>
<tr><td>5–8 marks</td><td>Good comparison of the environmental impact of wool, silk and hair fibres with synthetic fibres. Some points are discussed, that relate to some of the four areas – sourcing, processing, care and disposal. The information is mostly accurate and points made are usually relevant to the issues. There may be a lack of detail in two or more of the four areas, however there is an attempt to make a contrast between natural and synthetic fibres.</td></tr>
<tr><td>1–4 marks</td><td>Basic comparison of the environmental impact of wool, silk and hair fibres with synthetic fibres. A narrow range of points are discussed, that may in part relate to the four areas – sourcing, processing, care and disposal. The information lacks accuracy and discussion points may show confusion, which are not always relevant to the issues. There is a lack of detail in most of the four areas, with little or no attempt to make a contrast between natural and synthetic fibres.</td></tr>
<tr><td>0 marks</td><td>No response or nothing worthy of credit.</td></tr>
</table>
</td><td>12 marks</td><td>AO3 2a
AO3 2b</td></tr>
</table>

Indicative content

The sources of raw material:

- wool, silk and hair fibres are natural fibres which are mostly grown sustainably. Wool, silk and hair fibres can also be grown organically, without the need for any harmful chemicals
- synthetics are mainly derived from petrochemicals such as coal and oil which are non-renewable resources. They often use toxic chemicals in their production, however PET polyester is a sustainable synthetic material
- sourcing British fibres, eg wool is less detrimental than importing from abroad. Sourcing Chinese cashmere or silk does create environmental sustainability issues.

Processing:

- wool, silk and hair fibres need to be cleaned, and often bleached before they are dyed. This uses water and chemicals, which can run into rivers, and cause pollution if unregulated. Dyeing and processing fibres uses large amounts of electricity which causes CO2 emissions damaging the environment
- synthetics fibres are commonly dyed in the spinning solution. Some synthetic fabrics are sublimation printed, using energy and chemicals. It can be argued that processing synthetics requires less processes than other fibres.

Care and maintenance:

- wool, silk and hair fibres need careful consideration when laundering. These fibres cannot be easily washed and dried at home in machines, and usually require hand washing and gentle/specialist care. Natural fibres are generally more absorbent and may take more drying time and energy in their care. Wool, silk and hair fibres are usually recommended to dry clean, which reduces the need for water and detergents, but instead use chemicals for cleaning. Machine washable wool requires additional finishing processes which use detergents and energy
- all garments require water and detergents in their care. Because synthetics are non-absorbent, they usually dry quicker and require low temperatures in a washing machine and tumble dryer
- polyester, for example, is UV resistant so the colour will remain without fading in sunlight.

Disposal:

- wool, silk and hair fibres are biodegradable, and will break down fairly quickly in landfill. Most natural fibres can be recycled and reused to make new fibre, eg wool into shoddy. Chemicals in products, however, leach during decomposition giving off polluting gases
- synthetics are plastic based and take hundreds of years to biodegrade. Given that synthetics are long lasting fibres, they can be easily passed down to others or recycled.

Award any other valid responses.

<table>
<tr><th>Qu</th><th>Part</th><th>Marking Guidance</th><th>Total marks</th><th>AO</th></tr>
<tr><td>12</td><td></td><td>Explain the benefits of virtual modelling for use in client presentations.

<table>
<tr><td>5–6 marks</td><td>Detailed explanation of the benefits of virtual modelling for use in client presentations. In this mark band, there are many points which are relevant to the question. There is a wide breadth of points that demonstrate a very good level of understanding of the issues specific to client presentations and virtual modelling. There may be a slight lack of detail at the low end of the mark band, but this does not detract from a quality response.</td></tr>
<tr><td>3–4 marks</td><td>Good explanation of the benefits of virtual modelling for use in client presentations. In this mark band, there are points which are mostly relevant to the question. There are some points that demonstrate a good level of understanding of the issues specific to client presentations and virtual modelling. There is likely to be a lack of detail at the low end of the mark band, with some inaccurate information.</td></tr>
<tr><td>1–2 marks</td><td>Basic explanation of the benefits of virtual modelling for use in client presentations. In this mark band, there are few points which are relevant to the question. There are limited points that show little understanding of the issues specific to client presentations and virtual modelling. There is a lack of detail at the low end of the mark band, with confusion and inaccurate points.</td></tr>
<tr><td>0 marks</td><td>No response or nothing worthy of credit.</td></tr>
</table>

Indicative content

• Clients can see a 3D model of a garment and can see product from different viewpoints.
• Garments can be modelled on custom body measurements.
• Products can be made from stored designs saved electronically for the client to select design features and garment shapes.
• Virtual modelling can enable the garment to be emailed to clients.
• A computer screen can be shared remotely with the client, reducing the need for face-to-face meetings.
• Styles, fabrics and features can be changed with client consultation before making a toile or cutting fabric.
• The client can select a number of different colourways before deciding on a final design.
• Draping and fit of garments can be simulated without the need to try on physical garments.
• Prototypes are not required, saving time and materials.

Award any other valid responses.</td><td>6 marks</td><td>AO4 1b</td></tr>
</table>

Qu	Part	Marking Guidance	Total marks	AO
13		Give **two** uses for bindings cut on the bias when making textile products. **Indicative content** Any two correct points from the following: • bias binding is often used to finish **curved edges** • It can finish or neaten **raw edges/seams** • binding cut on the bias can be used to make **piping** • it can be used as a **decoration/colour contrast** • binding can be sewn to make **tape/cord** • it can be used for making a **channel**, eg boning. Award any other valid responses. 1 mark per correct point, up to a maximum of 2 marks.	**2 marks**	AO4 1a

Qu	Part	Marking Guidance	Total marks	AO
14		Give **three** advantages of sub-assembly. **Indicative content** • Garment parts are made simultaneously to the main production line which **speeds up** manufacturing. • Sub assembly can be used for parts of a product which require **specialist machinery**. • Parts of garments can be produced by **skilled workers**. • Product sections are checked at the sub assembly stage **ensuring accuracy/quality**. • Sub assembly lines allows faults to be more **easily identifiable/traceable**. Award any other valid responses. 1 mark per correct point up to a maximum of 3 marks.	**3 marks**	AO4 1a

<table>
<tr><th>Qu</th><th>Part</th><th>Marking Guidance</th><th>Total marks</th><th>AO</th></tr>
<tr><td>15</td><td></td><td>Figure 2 shows a pattern template for a table mat.

The pattern template is a rectangle with a semi-circle at each end.

Calculate the perimeter of the table mat shape to the nearest cm.

Show your working.

Note: if no working out is shown, but the correct answer is given, award full marks.

<table>
<tr><td>46 + 46
or
92</td><td>1 mark</td></tr>
<tr><td>[3.14, 3.142] × 28
or
[87.92, 87.98]</td><td>1 mark</td></tr>
<tr><td>180cm</td><td>1 mark</td></tr>
</table>
</td><td>3 marks</td><td>AO4 1c</td></tr>
</table>

<table>
<tr><th>Qu</th><th>Part</th><th>Marking Guidance</th><th>Total marks</th><th>AO</th></tr>
<tr><td>16</td><td></td><td>Outline the qualities required for a fashion collection to be worn in a warm climate.

In your answer you should refer to specific:

• fibre types
• fabric structures
• fabric properties.

<table>
<tr><td>7–9 marks</td><td>Detailed description of a range of qualities required for a fashion collection to be worn in a warm climate. There is an accurate knowledge of a wide range of qualities, which are appropriate for the specific environment. In this mark band there is reference to all three aspects of the points in the question – fibre types, fabric structures and fabric properties. These are not necessarily in equal measure, but the information given is largely correct and suitable for a warm climate. At the low end of the mark band, there may be a slight lack of detail, but the information shows a reasonably detailed understanding of the context.</td></tr>
<tr><td>4–6 marks</td><td>Good description of a range of qualities required for a fashion collection to be worn in a warm climate. There is some knowledge of a range of qualities, which are mostly appropriate for the specific environment. In this mark band there is reasonably accurate reference to most of the points in the question – fibre types, fabric structures and fabric properties. There is likely to be more information about one or two aspects over the other, showing some accuracy. At the low end of the mark band, there is likely to be a lack of detail, but the information generally shows a good understanding of the context.</td></tr>
<tr><td>1–3 marks</td><td>Basic description of a range of qualities required for a fashion collection to be worn in a warm climate. There is a limited knowledge of a range of qualities, which are not always appropriate for the specific environment. In this mark band there is limited reference to the three points in the question – fibre types, fabric structures and fabric properties. The information is likely to be inaccurate and confused, and may only focus on one aspect, or generally over two or more of the areas. At the low end of the mark band, there is a lack of detail, with very little or no understanding of the context.</td></tr>
<tr><td>0 marks</td><td>No response or nothing worthy of credit.</td></tr>
</table>
</td><td>9 marks</td><td>AO4 1c</td></tr>
</table>

		Indicative content **Fibre types:** • **natural plant/cellulosic fibres** such as cotton, linen and lyocells are breathable, keeping the wearer cool in warm climates • **natural animal/protein fibres**, eg silk is naturally breathable and cool • **manufactured fibres** such as viscose have good draping qualities, breathable and are soft and comfortable next to the skin • **synthetic fibres**, eg polyester is a UV resistant fibre. **Fabric structures:** • **woven fabrics** that have open structures can help to expel warm air away from the body, for example chiffon or plain-weaves • **lightweight fabrics** eg muslin, giving comfort to the wearer • **net and lace fabrics** are suitable for warm climates as they have a weightless quality • **weft knitted fabrics** have loops in their structure which allows perspiration and heat to escape • **single jersey** gives stretch/elasticity to a fabric, allowing it to be flexible and move with the wearer • **knitted structures** are less prone to creasing than other fabric types and suitable for warm climates. **Fabric properties:** • **breathability** – can help to expel warm air away from the body, keeping the wearer cool in warm climates • **lightweight** – fabrics for a warm climate should be as lightweight as possible to allow air to circulate keeping the wearer comfortable • **elasticity** – gives stretch allowing fabrics to be flexible and move with the wearer • **crease resistance** – garments that are less prone to creasing will keep their appearance for longer • **absorbency** – fibres with the ability to absorb perspiration will be comfortable to wear and keep the wearer cool • **easily laundered** – synthetic fibres are non-absorbent, are usually quick drying, and can be laundered at low temperatures • **colour fastness** – fabrics may be regularly exposed to sunlight, eg swimwear, colour should remain and not fade. Do not accept references to synthetic fibres in relation to breathability unless they are modified or engineered. Award any other valid responses.		

Qu	Part	Marking Guidance	Total marks	AO
17		Describe **two** different methods of core-spinning yarns. **Method 1:** • a sheath/outer covering of **staple/cut filament** fibres • are wrapped around **a central filament core** • the core is often made of **polyester/synthetic/elastomeric** fibres. 1 mark for a basic explanation. 2 marks for a detailed explanation with correct references to filament/staple/fibre type. **Method 2:** • outer **filament yarns** • are twisted around a **central filament core** • the outer filaments are **twisted in opposite directions** to balance the yarn. 1 mark for a basic explanation. 2 marks for a detailed explanation with correct references to filament/staple/fibre type. Maximum of 2 marks for each method. Award any other valid responses. Students may include diagrams to explain their answer.	**4 marks**	AO4 1a

<table>
<tr><th>Qu</th><th>Part</th><th>Marking Guidance</th><th>Total marks</th><th>AO</th></tr>
<tr><td>18</td><td></td><td>Pattern templates for two different sizes of similar patchwork pieces are shown in Figure 3.

Calculate lengths x and y.

Show your working.

Note: if no working out is shown, but the correct answers are given, award full marks.

<table>
<tr><td>$\frac{12.6}{10.08} = 1.25$

or

$\frac{10.08}{12.6} = 0.8$

Also accept 20% reduction (larger shape to smaller shape) or 25% increase (smaller shape to larger shape)</td><td>1 mark</td></tr>
<tr><td>10.5×0.8

or

$\frac{10.5}{1.25}$

Answer x = 8.4cm</td><td>1 mark</td></tr>
<tr><td>9.12×1.25

or

$\frac{9.12}{0.8}$

Answer y = 11.4cm</td><td>1 mark</td></tr>
</table>
</td><td>3 marks</td><td>AO4 1c</td></tr>
</table>

<table>
<tr><th>Qu</th><th>Part</th><th>Marking Guidance</th><th>Total marks</th><th>AO</th></tr>
<tr><td>19</td><td>1</td><td>Calculate the area of the diamond-shaped patchwork piece shown in Figure 4.

Note: if no working out is shown, but the correct answer is given, award full marks.

<table>
<tr><td>$\frac{1}{2}$ 14 × 18
or
7 x 9 = 63 x 2
or
18 x 7
or
14 x 9</td><td>1 mark (M)</td></tr>
<tr><td>= 126 cm^2</td><td>1 mark (A)</td></tr>
</table>
</td><td>2 marks</td><td>AO4 1c</td></tr>
</table>

<table>
<tr><th>Qu</th><th>Part</th><th>Marking Guidance</th><th>Total marks</th><th>AO</th></tr>
<tr><td>19</td><td>2</td><td>
The hexagon shown in Figure 5 is a patchwork piece made up of six identical equilateral triangles.

Calculate the area of the hexagon to the nearest cm^2

Note: if no working out is shown, but the correct answer is given, award full marks.

<table>
<tr><td colspan="2">$H^2 + 40^2 = 80^2$
or
$H^2 = 80^2 – 40^2$</td><td>1 mark (M)</td></tr>
<tr><td colspan="2">$H = \sqrt{80^2 – 40^2} = 69.282$</td><td>1 mark (M)</td></tr>
<tr><td>Area of one triangle:
$= \frac{1}{2} \times 80 \times$ their 69.282
= 2771.281</td><td>Area of one trapezium:
$= \frac{16+8}{2} \times$ their 69.282
= 8313.843775</td><td>1 mark (M)</td></tr>
<tr><td>6 × their 2771.281
= 16627.668775 mm^2</td><td>= their 8313.843775 x 2
= 16627.668775</td><td>1 mark (M)</td></tr>
<tr><td colspan="2">166 cm^2</td><td>1 mark (A)</td></tr>
</table>
</td><td>5 marks</td><td>AO4 1c</td></tr>
</table>

<table>
<tr><th>Qu</th><th>Part</th><th>Marking Guidance</th><th>Total marks</th><th>AO</th></tr>
<tr><td>20</td><td></td><td>Analyse and evaluate the economic and social impact of offshore production.

In your answer consider the issues for:

• the manufacturer
• the workers.

<table>
<tr><td>7–9 marks</td><td>Detailed analysis and evaluation of the economic and social impact of offshore production. There is an excellent understanding, which includes points relating to both social and economic issues. The analysis and evaluation consider positive and negative points. There may be more detail in one area over the other, but on the whole, there is a good balance of information that links to the issues of the manufacturer and workers. At the low end of the mark band there may be a slight lack of detail, however there are a number of correct points relevant to the impact of offshore production.</td></tr>
<tr><td>4–6 marks</td><td>Good analysis and evaluation of the economic and social impact of offshore production. There is some understanding, which includes points that mostly relate to social and economic issues. The analysis and evaluation may consider positive and negative points, although there may be more emphasis on one area over the other. On the whole, there is some balance of information that links to the issues of both the manufacturer and workers. At the low end of the mark band there may be a lack of detail and accuracy, however there are a few correct points relevant to the impact of offshore production.</td></tr>
<tr><td>1–3 marks</td><td>Basic analysis and evaluation of the economic and social impact of offshore production. Points mostly relate to social and economic issues, with limited understanding. The analysis and evaluation mainly focus on positive or negative points, with more emphasis on one area over the other. There are a few correct points that may link to the issues of the manufacturer and workers. At the low end of the mark band there is a lack of detail and accuracy, with limited information relevant to the impact of offshore production.</td></tr>
<tr><td>0 marks</td><td>No response or nothing worthy of credit.</td></tr>
</table>
</td><td>9 marks</td><td>AO3 2a
AO3 2b</td></tr>
</table>

Indicative content

Economic Impact

Positive

- **Labour is cheap** in offshore countries, offering competitive/low-cost prices for retail products.
- Manufacturers **lower product costs** in the UK as they don't need to own factories and pay overheads.
- Costs for **specialised equipment** are not needed, or reduced.
- Offshore production means that smaller manufacturers can **compete** for work alongside other companies with comparable risk.
- Use of **skilled workers** in offshore countries.
- Offshore countries benefit from **increased revenue/work** and gain more labour opportunities.
- Easy to **scale up production** as more workers are available.

Negative

- Offshore production relies on a chain of designers and manufacturers across the world to work together, often **communication** can be challenging.
- At some point in the production the chain may break down and **incur delays in stock** to the UK.
- The quality and overall finish of a garment produced from an offshore production system may be of a **lower quality** or a lower standard of manufacture.
- Jobs opportunities **are taken** from the UK.
- The UK has high labour costs, taking into account **minimum/living wage.**

Social Impact

Positive

- Offshore manufacturing **contributes to the economy** of developing countries.
- Skilled workers can be employed offshore, making use of **cultural techniques** unique to a region.
- Some companies **contribute to the local economy** by providing clean water, good living conditions and education programmes.

Negative

- Offshore manufacturing can contribute to the **exploitation of workers** in developing countries such as slave, forced and child labour.
- Workers can be **paid unfairly**.
- There is potential for **unsafe working conditions**, some factories are unregulated and are not subject to strict UK laws.

Award any other valid responses.

<table>
<tr><th>Qu</th><th>Part</th><th>Marking Guidance</th><th>Total marks</th><th>AO</th></tr>
<tr><td>21</td><td></td><td>Explain why polar fleece is used for fashion and textiles products.

In your answer refer to the structure of the fabric.

<table>
<tr><td>5–6 marks</td><td>Detailed explanation why polar fleece is used for fashion and textiles products. The reasons given for its use are relevant to polar fleece fabric, showing a thorough knowledge and understanding of this specific fabric type. The answer includes references to the structure of polar fleece, which are largely accurate. At the top end of the mark band there are many points that are knowledgeable, while at the low end there may be a slight lack of detail, but this does not detract from the response.</td></tr>
<tr><td>3–4 marks</td><td>Good explanation why polar fleece is used for fashion and textiles products. The reasons given for its use are mainly correct and relevant, showing some knowledge and understanding of this specific fabric type. The answer may include references to the structure of polar fleece, which are largely accurate. At the top end of the mark band there are a few points, however overall there is sufficient information with some accuracy.</td></tr>
<tr><td>1–2 marks</td><td>Basic explanation why polar fleece is used for fashion and textiles products. The reasons given for its use are lacking in detail and not always relevant, showing a limited knowledge and understanding of this specific fabric type. The answer has minimal or no references to the structure of polar fleece. At the top end of the mark band there may be a little information, however, there is likely to be confusion and inaccuracy at the low end of the mark band.</td></tr>
<tr><td>0 marks</td><td>No response or nothing worthy of credit.</td></tr>
</table>

Indicative content

Why polar fleece is used:

• polar fleece is a good insulator, due to the air pockets in the looped/knitted structure or air trapped in the surface pile
• its three-yarn system creates a warm fabric
• it has a slight stretch and give, due to its weft knitted structure
• it provides some water resistance, helped by the brushed surface texture
• the fabric is soft and comfortable, because it is brushed on both sides to give a nap/pile
• the surface texture can be looped or cut to give a soft handle
• the polyester fibre makes the fabric very lightweight</td><td>6 marks</td><td>AO4 1b</td></tr>
</table>

		• it is **fast drying** due to the **non-absorbent** properties of polyester • polar fleece is **durable**, as a result of the long lasting **properties of polyester** • the surface of the fabric can **resist pilling** • the synthetic fibres can be **modified** to improve wicking and breathable properties • environmentally friendly **if made** from recycled plastics/bottles. Do not award credit for references to 'cheap/inexpensive'. Award any other valid responses.		