

## Year 11 Revision Booklet

### Tips

120 marks - 120 minutes for the paper - a minute per question - time yourself!

Words such as list, state or name usually indicate that one word answers are acceptable.

Words such as describe or analyse usually require a more detailed, structured answer.

If asked to draw a diagram you should draw one. Add clear annotations (labels) where required.

If you are asked to draw an item, look at the number of marks allocated for it and include at least that number of features in the design. Colour will be expected in design questions.

The marks allocated for each part of the question are a good guide to the amount of detail needed in the answer.

The amount of space (number of lines) is another clue to how detailed the answer should be.

Spelling is not crucial, but legible handwriting is. Marks are not lost if a word is spelt incorrectly, but they are if the examiner cannot read and understand your answer.

Remember to use the knowledge you have gained from your coursework. Questions often refer to the design and make process you have actively experienced. Don't forget - there are no trick questions and a lot of them are common sense, applying the knowledge that you already have to given situations.

### Section A Research (to generate ideas)

The first question on your paper will relate to research, focusing on your chosen product and the theme of **India**.

You should have been researching **India** and have a bank of relevant designs.

Consider such things as:

- Things a designer needs to know eg where the product will be sold with reasons.
- How would information about past sales be used when planning a new range?
- What 3 things would a designer need to know before planning a new range of products?
- Give 2 reasons why someone would buy a one-off design.
- Designers will often study existing products before coming up with new ideas for their product - how can this help them?
- Describe 2 ways a designer can find information about future trends.
- You could be given examples of 'existing' designs that are not selling well and be asked to consider reasons for this.
- Give 3 things a designer would need to know about fabric structure before designing a suitable product.
- Consider embellishments you could use for your product - give reasons for your choices.

- Consider sources where you could look for ideas for your product and be able to explain how these could help you when designing your product.
- Be able to list things that you have found out when researching **India** and the type of product you are designing.
- Be able to explain different ways the designer can get ideas for **India** and your chosen product.
- Why is it important, when looking at the work of others, not to make exact copies?
- What safety considerations should you consider when designing for children?

### **Section A Designing your product around 1/3 of the marks on this question!**

You will be asked to show 2 designs. READ the *design brief* at the beginning of the exam paper. You must keep referring back to the *brief*. LABEL your ideas. Your designs must be different. If the designs are similar you will only be awarded marks for one design. You will attract marks for the quality of your designs. Practice drawing your designs and have some ideas prior to the exam. Remember, the designs are educational products for children and should be on the theme of **India**.

You will be asked to develop one of your ideas. Check where the marks are to be awarded and ensure that you cover all these points in your design. ORIGINALITY/COLOUR/FABRICS AND COMPONENTS/QUALITY OF DESIGN AND DRAWING. Check that the design fits the brief. Good quality drawings will attract higher marks. You should also use smart and/or modern materials as these will enhance the theme of science and technology. **It is also highly likely that there will be subsequent questions featuring modern materials.**

Practice your drawings and know exactly what you are going to design before you go into the exam. Take coloured pencils.

### **Section B Fabrics/Components/Decorative Techniques** (for your product)

- Fabric - You will need to know about the construction of knitted and woven structures and their properties. Which is the most suitable for your designs and why? **You should include a modern fabric.**
- Components for your product. This could include anything which is not the fabric. Components should also be suitable for *children*. Be aware of the safety considerations; small parts, sharp edges, loose fibres etc.
- Labels are also components so you should be aware of the different wash/iron/dry clean and bleach symbols. You should also be aware of other types of labelling such as recycling, wool, cotton and environmental labels.
- Interfacing - to strengthen and stabilise a structure.

- Know how to make decorative techniques such as appliqué, embroidery, sheesha and batik and be able to say why your chosen techniques would be suitable.
- Be able to use and explain at least one smart material, such as thermochromic or photochromic dyes, these will also make your product unique!

## **Developing/Manufacturing your product**

This could include several different aspects of manufacturing.

- Patterns and templates - why are they used? Advantages of using an existing product - it has been tried and fit is assured. Advantages of a new template - diversity of designs.
- What is a prototype and why is it used? To test the product for fit and allow for modifications, to ensure that the processes being used on the product actually work, avoiding costly mistakes, to plan the best process for making up and allow planning for batch production.
- Seams - consider overlapped, lapped or double stitched, French seams. Which are the most suitable for your product?
- Investigate ways of adding colour/changing decoration (on your product).
- Production planning. Why is it used?

## **Systems (quality control and health and safety are also control systems)**

**Make through** - Where one operator makes a product through from start to finish.

Advantages - no work in progress, good for small quantities as it will not take as much time to set up the machines.

Disadvantages - experienced operators are needed who need to be skilled in several areas, expensive to operate.

Useful for samples, one-off and small runs such as haute couture or wedding dresses or a small unit making exclusive garments.

**Production line** - where operators specialise on one part of the making up.

Advantages - faster throughput of garments as operators work on the repeating the same job. Less expensive to train operators.

Disadvantages - operators work at different speeds so would need a bank of work in progress to prevent them running out of work. This can be costly. If a machine breaks down then excessive amounts of work can build up which is also expensive. The system can be expensive to set up as several machines will be needed.

**Horseshoe** - operators work standing up in a horseshoe formation. Each operator can do the work of the others and they work as a team. Single garments are passed from one operator to the next. An operator will not stand waiting for the next garment

but instead will work on the next operation for the garment she is currently working on. This provides for the speed of teams without the build up of work in progress.

**Sub assembly** - making parts of the garment or product separately, such as a collar, pocket, cuff and then bringing the pieces together to make the final product.

## CAD

### Advantages of CAD

- It enables designs to be drawn accurately and modified without redrawing the whole design.
- Objects designed using CAD can be rotated so different angles can be seen. It enables designers to visualise things in 3D.
- Designers and customers can send information to each other electronically.
- Changes and modifications can easily be made before a prototype is made.
- Simulations can be set up to test designs and fabrics, eg checking print size and colours.
- CAD can be used in production of one-off items, batches or mass produced.

### Disadvantages of CAD

- It is very expensive to set up.
- People must be trained to use it.
- Technical support is needed in case the system fails.
- Computers and machinery have to be maintained to enable them to work efficiently.

## CAM

### Advantages of CAM

- A computer programme can ensure that a task is performed exactly the same way every time.
- A single person can control many operations at once.
- Human error is reduced.
- Fewer people need to be employed so labour costs are low.
- Dangerous jobs can be done without people being involved.
- Advantages of using CAM for cutting and laying fabric - speed, enables operators to be working on other jobs whilst the fabric is being cut, accuracy - fabric would be laid up with less tension and give a better fitting garment, accurate cutting means an easier garment to sew together

- Advantages when sewing buttonholes - evenly spaced (eg shirt fronts), accuracy, operator can load one machine whilst another is sewing
- Advantages when steam pressing - even temperature, even distribution of steam into the garment, improved presentation
- Cam can also be used to print and apply colour to fabric.

#### Disadvantages of CAM

- It is very expensive to set up.
- There are fewer jobs available.
- If a computer crashes, the whole system comes to a standstill.
- Computer programmes are not able to cope with problems not foreseen by the programmers.

Computers can also be used for stock control to monitor stock levels and highlight when fabrics and components need to be re-ordered.

## Quality Control

- Be able to identify at least 3 quality control checks that could be applied to the making of your product.
- Be able to identify a range of quality control checks that could be applied to other products such as - checking seam tolerances, checking stitch length, buttons secure, components securely attached, button holes and buttons evenly and correctly spaced, seams secure, check fabric for holes, flaws and shading, check printing correctly placed, final quality control check for overall appearance. These are examples and there are others which can be added. Check quality control points for your product!

## Health and Safety

In the workplace.

- Electricity
- Sharp edges and blades - use guards on machines and chain mail gloves on band knives and straight knives.
- Industrial machines are much faster
- Trip hazards
- Ensuring that operators are correctly trained to use the machines they are operating.
- Ensure that machines are correctly and regularly maintained.
- Ensure that there is sufficient space to work around machines and cutting tables.

In the product. Be aware when making for young children. Consider possible choking hazards, nightwear needs to be flame retardant, no sharp edges, labelling needs to be appropriate, some of which is compulsory.

## Environmental

- *Natural fibres* are from renewable sources (grown from animals or plants) and can biodegrade (rot away) - but are more difficult to recycle. Cotton is grown in hot countries and has to be transported, which uses fuel.
- *Synthetic* (oil based fibres such as polyester, acrylic, nylon) is not from renewable sources but is easier to recycle as it can be melted and reprocessed. It will not biodegrade in landfill sites.
- *Man made* (fibres from resin such as acetate and viscose are from cellulosic (natural) sources through a manmade process).
- Packaging - be aware of recyclable packaging, using minimal packaging, using paper rather than plastic.
- Transport of any fabrics or components causes excessive carbon emissions. Alternative fuels such as bio-fuels.
- Pesticides used on plant based fibres can cause environmental damage. Cotton uses a lot of pesticides. Organic/Fairtrade.
- Dyes and processes used on fabrics can cause pollution.
- Excessive use of water in dyeing or processing or for irrigation of crops (cotton needs a lot of water and is grown in hot countries where water is often scarce).
- Be aware of the recycling symbol. Alternative energy sources such as solar, wind and bio fuels.

## Packaging

- To protect the garment.
- To give information about the product.
- Labelling - care labels/fibre content labels/information about the product or retailer.
- Bar codes - advantages can be that they are unique to the product which makes it easier to track the product. It is also a universally recognised system.
- Things that might be on a label are the brand name of the product, the care instructions, country of origin, fibre content (by law).
- Be able to recognise the recycling, cotton, wool labels.
- Be aware of the legal labelling requirements for children's products!

## Fabric Finishes

- Brushing - to make the fabric feel softer and warmer
- Mercerising - to make cotton fabric more shiny
- Water repellent - to stop water soaking into fabric but allow air to pass through
- Waterproofing - to prevent any water passing through fabric
- Stain repellent - to prevent dirt and stains clinging to fabric
- Anti-static - to prevent fibres developing a static charge
- Shrink resist - to prevent shrinkage because of felting
- Mothproofing - to protect from moth attack on wool

## Properties of Fibres

**Fibres** are the small hairs that are twisted or spun together to make a **yarn** and knitted or woven to form a **fabric**.

Do not confuse fibres and fabrics. You should be familiar with the properties of fibres to be able to apply them to products.

Natural fibres are cotton and linen (from plants) - cool, crease easily

Wool and silk (from animals) - warm and resilient

Natural fibres are absorbent and therefore comfortable to wear.

Synthetic fibres are made from oil - polyester, nylon, acrylic - not absorbent can be recycled but are not from renewable sources. Warm. Crease resistant (easy care).

Man-made fibres - acetate, viscose - from resin (plant sources). Cheaper and from renewable sources. Crease easily, weaker fibres. Absorbent.

Mixed fibres - consider the advantages of mixing fibres to gain the advantages of both. Eg to make a fabric cheaper or easier to care for.

Laminated fabrics are made up of two or more layers of fabrics.

**SMART FABRICS** - fabrics which have memory and react automatically to changes in the surroundings. Examples of these are **thermochromic** dyes which change colour when exposed to heat and **photochromic** dyes which change colour when exposed to light. These dyes are incorporated into the fabrics using **microencapsulation**.

**MODERN FABRICS** - new fabrics are constantly being developed. Examples of these are:

- **Nanotechnology** - nanofibres are usually made from extremely thin carbon or synthetic polymers. Potential applications - bullet proof vests.
- **Nanoparticles** can be applied to existing fibres and fabrics. The extreme thinness of the coating does will not change the feel of the fabric. Nanoparticles of silver can be attached to fabrics to create antibacterial fabrics for medical uses and even odour free socks. Fabric can be coated with nanoparticles that will resist and break down dirt and stains making self cleaning fabrics.
- **Microfibres** - really thin fibres up to 100 times thinner than a human hair - can be tightly woven for water resistance, but will let perspiration out creating breathable fabrics. Expensive, soft, comfortable, durable with good drape.
- **Nomex** - fire resistant polymer used for firefighters' clothing and racing drivers' overalls.
- **Kevlar** - strong polymer. Abrasion resistant. Can be used for bullet proof vests.
- **Tencel/lyocell** - regenerated fibre from wood pulp. Environmentally friendly, minimising energy and waste. Ideal for a variety of textile applications. High wet strength.
- **Bamboo** - fast growing, biodegradable and sustainable. Uses harsh chemicals to dye.
- **Hemp** - sustainable and biodegradable.
- **Nettles** - sustainable and biodegradable.
- **Ingeo** - from the plant sugars in corn
- **Biofibres** - made from renewable plant materials such as corn, soya and wheat.
- **Fastskin** - developed by Speedo to mimic sharkskin. The rough surface reduces drag and allows the swimmer to go faster.

**Wearable Technology** - incorporating **electronics** into textiles, such as satnavs, personal communication and entertainment devices, solar panels etc.

## Marketing

Consider the advantages and disadvantages of selling in designer shops, high street chains, mail order catalogues, market stall. Running cost, customer base, advertising, customer perception of the outlet.

You may be asked a straightforward calculation question. Read the question properly and check your answers.