

Year 11 – GCSE Design and Technology – Exam Preparation – The Exam Paper set up

SECTION A – Core Technical Principles (20 marks)

A mixture of multiple choice and short answer questions assessing a breadth of technical knowledge and understanding.

- new and emerging technologies
- energy generation and storage
- developments in new materials
- systems approach to designing
- mechanical devices
- materials and their working properties.

SECTION B – Specialist Technical Principles (30 marks)

Several short answer questions (2–5 marks) and one extended response to assess a more in depth knowledge of technical principles.

- selection of materials or components
- forces and stresses
- ecological and social footprint
- sources and origins
- using and working with materials
- stock forms, types and sizes
- scales of production
- specialist techniques and processes
- surface treatments and finishes.

SECTION C – Designing and Making Principles (50 marks)

A mixture of short answer and extended response questions.

- investigation, primary and secondary data
- environmental, social and economic challenge
- the work of others
- design strategies
- communication of design ideas
- prototype development
- selection of materials and components
- tolerances
- material management
- specialist tools and equipment
- specialist techniques and processes

Useful websites

Technology student
BBC Bite size

Examples of questions within each section

Section A

A malleable material is one that

- A can be pressed into a shape or form. ☐
- B is able to withstand scratches and indents ☐
- C is hard to break or snap. ☐
- D rusts with exposure to air and moisture. ☐

Section B

Table 1 identifies specific processes used to remove different materials and make sure materials are cut to a tolerance.

Choose one process from **Table 1** and, using notes and/or sketches, describe the process in detail.

Table 1

Turning	Die cutting	Laser cutting	Cutting by shearing
---------	-------------	---------------	---------------------

Section C

Explain the importance of evaluation when developing prototypes.

Give specific examples in your answer.

1
6
2

A number of calendars are being made.

Given the sizes provided in **Figure 5** and **Figure 6**, how many calendar pages can be made from **one** sheet?

[2 marks]

Figure 5

1187 mm

Material sheet

841 mm

Figure 6

280 mm

Calendar page

210 mm

Not drawn to scale

Answer _____

1
6
3

What percentage of material is waste after cutting the pages calculated in Question **16.2**?

Show your working and give your answer to **two** decimal places.

[3 marks]

Answer _____

RESEARCH DESIGN

Survival while
outside the
box

2 **2**

The step ladder in **Figure 4** has 12 steps. Each step is 275 mm long, 100 mm wide and 25 mm thick.

Figure 4



2 **2** **1**

Each step should be 275 mm long.

The manufacturing tolerance is $\pm 0.5\%$.

Calculate the maximum and minimum length of each step to two decimal places.

[2 marks]

Do not write
outside the
box

DOI: 10.1002/for

2 **2** **1**

Study the diagram of the box in **Figure 5**.

Figure 5

The overall base dimensions are 300 mm × 300 mm.

The thickness of the material used for the sides of the box is 15 mm.

Use the dimensions provided to calculate the **internal** base area of the box.

Give your answer with units.

Show your working.

[4 marks]

Answer _____

Do not write
outside the
box

DOI: 10.1002/for

Turn over ►