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| Surname             |  |  |  |  |  | Other Names      |  |  |  |  |  |
| Centre Number       |  |  |  |  |  | Candidate Number |  |  |  |  |  |
| Candidate Signature |  |  |  |  |  |                  |  |  |  |  |  |

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General Certificate of Secondary Education  
June 2005



**DESIGN AND TECHNOLOGY:  
RESISTANT MATERIALS TECHNOLOGY  
Foundation Tier**

**3545/F  
F**

Thursday 26 May 2005 9.30 am to 11.30 am

**In addition to this paper you will require:**

- a pen, pencil, ruler, eraser, pencil sharpener and coloured pencils;
- a colour insert sheet (enclosed).

| For Examiner's Use  |      |        |      |
|---------------------|------|--------|------|
| Number              | Mark | Number | Mark |
| 1                   |      |        |      |
| 2                   |      |        |      |
| 3                   |      |        |      |
| 4                   |      |        |      |
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| 6                   |      |        |      |
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| 8                   |      |        |      |
| 9                   |      |        |      |
| 10                  |      |        |      |
| 11                  |      |        |      |
| 12                  |      |        |      |
| 13                  |      |        |      |
| Total (Column 1)    | →    |        |      |
| Total (Column 2)    | →    |        |      |
| TOTAL               |      |        |      |
| Examiner's Initials |      |        |      |

Time allowed: 2 hours

**Instructions**

- Write your name and other details in the spaces provided above.
- Answer **all** the questions in the spaces provided.

**Information**

- The maximum mark for this paper is 125.
- Mark allocations are shown in brackets.
- A colour insert sheet has been provided for use in answering questions in this paper.
- Wherever calculations are needed you should show your working.
- All dimensions are given in millimetres unless otherwise stated.
- You are reminded of the need for good English and clear presentation.

Questions 1 to 4 on this paper relate to the Design Brief given below.

### Design brief

A manufacturer of office equipment has asked you to design a *desktop organiser*.

Examples of the type of office stationery and equipment which could be stored are shown as **Figure 1** on the colour insert sheet.

A black and white copy of **Figure 1** is shown below.



**Figure 1**

Images reproduced by kind permission of the following companies:

'Post-it' is a registered trademark of 3M company  
[www.snowpake.net](http://www.snowpake.net)  
 West Mercia Supplies (WMS) SY3 5HJ  
[www.imation.co.uk](http://www.imation.co.uk)

Answer **all** questions in this paper.

**Question 1 is about the design specification.**

**You should spend about 5 minutes on this question.**

**1** Give **four** design requirements of the *desktop organiser*. Explain each of your answers.

(An example has been completed for you.)

*Example: The desktop organiser should make it easy to find the stationery.*

*Explanation: This will save a lot of time spent looking for the stationery.*

Requirement 1: .....

Explanation: .....

.....  
(2 marks)

Requirement 2: .....

Explanation: .....

.....  
(2 marks)

Requirement 3: .....

Explanation: .....

.....  
(2 marks)

Requirement 4: .....

Explanation: .....

.....  
(2 marks)

**Question 2 is about design ideas.**

**You should spend about 35 minutes on this question.**

- 2** Study the information given in the **design brief** and your **design specification**. Use this information to help you sketch **three** different design ideas for a desktop organiser.

Add notes to explain each of your ideas.

Marks will be awarded for:

- **three** different ideas;           *(3 × 6 marks)*
- quality of sketches;           *(5 marks)*
- quality of notes.           *(6 marks)*

**Idea 1**

**Idea 2**

**Idea 3**

**Turn over ►**

**Question 3 is about testing and evaluation.**

**You should spend about 5 minutes on this question.**

**3** Choose your best design idea from **Question 2**.

Chosen idea: Number .....

(a) Give **two** reasons why you think this is your best idea.

Reason 1: .....

.....  
(1 mark)

Reason 2: .....

.....  
(1 mark)

(b) Describe **two** tests that you would carry out to evaluate your desk tidy *after* it has been made.

Test 1: .....

.....  
.....  
(2 marks)

Test 2: .....

.....  
.....  
(2 marks)

Question 4 is about making.

You should spend about 25 minutes on this question.

4 Figure 2 shows two designs for a note pad holder which could be made in the school workshop.

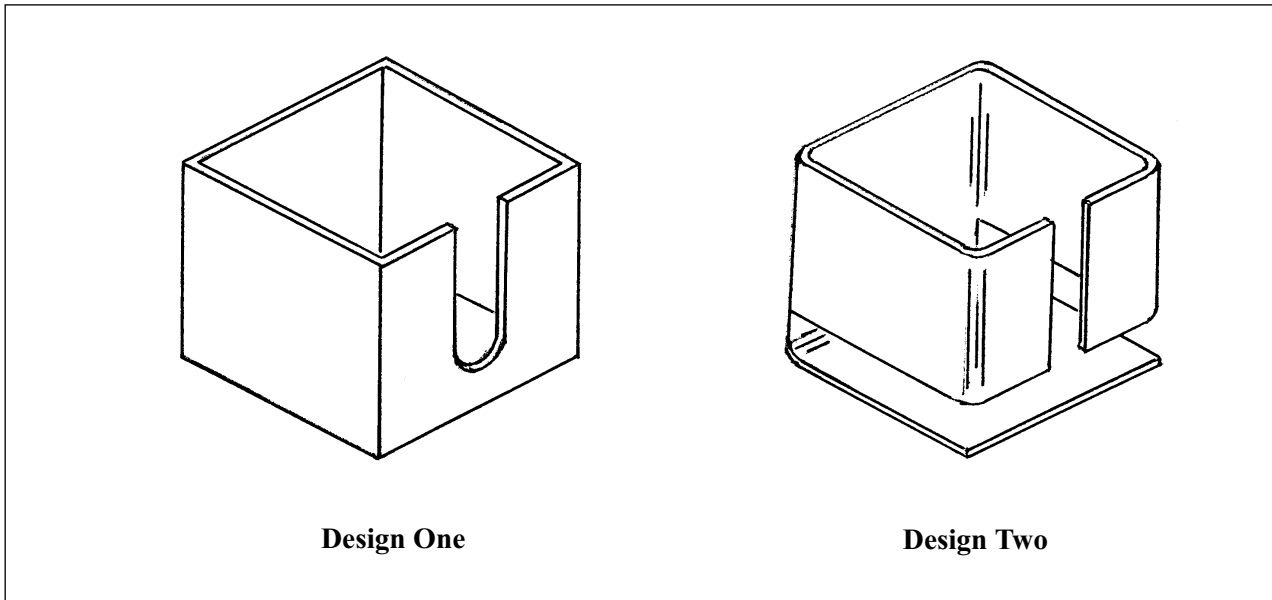


Figure 2

Choose **one** of the designs.

Chosen design: .....

(a) Name **one** suitable *specific* material from which to make your chosen design and give **one** reason for your choice.

Material: ..... (2 marks)

Reason: .....  
..... (1 mark)

QUESTION 4 CONTINUES ON THE NEXT PAGE

Turn over ►

- (b) Using notes and sketches, clearly show how you would *make* your chosen design.

At each stage, name all the tools and equipment you would use.

Marks will be awarded for:

Quality of notes and sketches.

*(4 marks)*

Stage 1: Marking out

*(4 marks)*

Stage 2: Cutting and shaping

*(4 marks)*



Stage 3: Joining/bending

*(4 marks)*

Stage 4: Finishing

*(4 marks)*

**Turn over ►**

**Question 5 is about health and safety.**

**You should spend about 5 minutes on this question.**

**5** Drilling machines must be regularly maintained to keep them in safe working order.

List **two** checks that are made on a drilling machine to make sure it is in safe working order.

Explain why this check is important.

Check 1: .....

Explanation: .....

.....  
(2 marks)

Check 2: .....

Explanation: .....

.....  
(2 marks)

○  
—  
4

**Question 6 is about materials and finishes.**

**You should spend about 10 minutes on this question.**

**6** Study the magazine files shown as **Figure 3** on the colour insert sheet.

- (a) Name **one** suitable, *specific* material from which to make each magazine file and give **one** reason for your choice.

**Magazine file A**

Material: .....  
(2 marks)

Reason: .....  
.....  
(1 mark)

**Magazine file B**

Material: .....  
(2 marks)

Reason: .....  
.....  
(1 mark)

**Magazine file C**

Material: .....  
(2 marks)

Reason: .....  
.....  
(1 mark)

- (b) (i) Name **one** suitable, *specific* finish for the material you have chosen for **Magazine file A**.

**Magazine file A**

Finish: .....  
(2 marks)

- (ii) Name **one** suitable, *specific* finish for the material you have chosen for **Magazine file B**.

**Magazine file B**

Finish: .....  
(2 marks)

**Turn over ►**

**Question 7 is about systems and control.**

**You should spend about 5 minutes on this question.**

7 Study the chair shown as **Figure 4** on the colour insert sheet.

(a) Explain why the chair base has five feet.

Explanation: .....  
.....  
.....

(2 marks)

(b) (i) Name the part labelled as **Part D**.

**Part D:** .....  
(1 mark)

(ii) Explain the *advantage* to the *customer* of using this part.

Explanation: .....  
.....  
.....

(2 marks)

5

**Question 8 is about systems and control.**

**You should spend about 5 minutes on this question.**

**8** Study the lamp shown as **Figure 5** on the insert sheet of colour images.

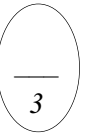
(a) Name the mechanism labelled as **Part E**.

Mechanism .....  
*(1 mark)*

(b) Complete the following sentence.

When the handle is turned around, the mechanism shown as **Part E** converts R \_ \_ \_ \_ motion  
into L \_ \_ \_ \_ motion.

*(2 marks)*



**TURN OVER FOR THE NEXT QUESTION**

**Turn over ►**

**Question 9 is about systems and control.**

**You should spend about 5 minutes on this question.**

- 9 Study *the lamp*, *the paper punch* and *the pencil sharpener*, shown as **Figures 5 & 6**, on the colour insert sheet.

Complete **Table 1**.

**The lamp** example has been done for you.

|                             | <b>Input</b>   | <b>Process</b>             | <b>Output</b>                            |
|-----------------------------|--|----------------------------|--|
| <b>the lamp</b>             | <i>The handle is turned in a clockwise direction</i> | <i>The mechanism turns</i> | <i>The lamp is clamped to the table.</i> |
| <b>the paper punch</b>      |  |                            |  |
| <b>the pencil sharpener</b> |  |                            |  |

**Table 1**

(6 marks)

6

**Question 10 is about scales of production.**

**You should spend about 5 minutes on this question.**

**10** Study the **descriptions** listed below.

| <b>Descriptions of scale of production</b>                  |
|---|
| A single product is made                                    |
| Very labour intensive                                       |
| Non-stop production (24/7)                                  |
| Many identical products can be made                         |
| Machinery can be used to make batches of different products |

(a) Look at **Table 2**.

Complete column (a) by copying the description, which best describes the scale of production.

(b) Complete column (b) by naming a product which would be made by each method.

| <b>Scale of Production</b>             | <b>(a) Descriptions of scale of production</b> | <b>(b) Product</b> |
|--|--|--------------------|
| <b>One-off production</b>              |  |                    |
| <b>Batch production</b>                |  |                    |
| <b>Mass production</b>                 |  |                    |
| <b>Continuous/flow line production</b> |  |                    |

**Table 2**

*(8 marks)*

**Turn over ►**

**Question 11 is about marking out.**

**You should spend about 5 minutes on this question.**

**11** Study the tools shown as **Figure 7** on the colour insert sheet.

Complete **Table 3** by matching the correct tool letter with each description.

You may use each tool **once** only.

| Description  | Tool |
|--|------|
| Measuring a 50 mm length of nylon rod                        |      |
| Measuring a 1100 mm width on a sheet of MDF                  |      |
| Marking a line parallel to an edge on a piece of wood        |      |
| Marking a line at right angles to an edge on a piece of wood |      |

**Table 3**

*(4 marks)*



**TURN OVER FOR THE NEXT QUESTION**

**Turn over ►**

**Question 12 is about consumer protection.**

**You should spend about 5 minutes on this question.**

**12** Study the list of products shown below:

- |               |                     |
|---------------|---------------------|
| Electric iron | Child’s tricycle    |
| Board game    | Sunglasses          |
| Baseball hat  | Electric lawn mower |

(a) Select a product from the list which is most likely to display each of the following symbols.

You may use a product **once** only.



Product: .....  
*(1 mark)*



Product: .....  
*(1 mark)*

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Product: .....  
*(1 mark)*

(b) Give **two** reasons why a *manufacturer* should use these symbols on their products.

Explain each of your answers.

Reason 1: .....  
.....  
(1 mark)

Explanation: .....  
.....  
(1 mark)

Reason 2: .....  
.....  
(1 mark)

Explanation: .....  
.....  
(1 mark)

7

**TURN OVER FOR THE NEXT QUESTION**

**Turn over ►**

**Question 13 is about product analysis.**

**You should spend about 5 minutes on this question.**

**13** Study the two staplers shown as **Figure 8** on the insert sheet of colour images.

(a) Explain why there is a difference in the cost of the two staplers.

Explanation: .....  
.....  
.....  
.....  
*(3 marks)*

(b) Which of the **two** staplers is the easiest to use?

Stapler Number: .....  
Explain your answer.  
Explanation: .....  
.....  
.....  
.....  
*(3 marks)*

(c) Which of the **two** staplers is most suited to use in a school office?

Stapler Number: .....  
Explain your answer.  
Explanation: .....  
.....  
.....  
.....  
*(3 marks)*

**END OF QUESTIONS**

**DESIGN AND TECHNOLOGY  
RESISTANT MATERIALS TECHNOLOGY:  
FULL COURSE**

**3545/F**

**Foundation Tier**

**F**

This insert is provided for use in the examination.



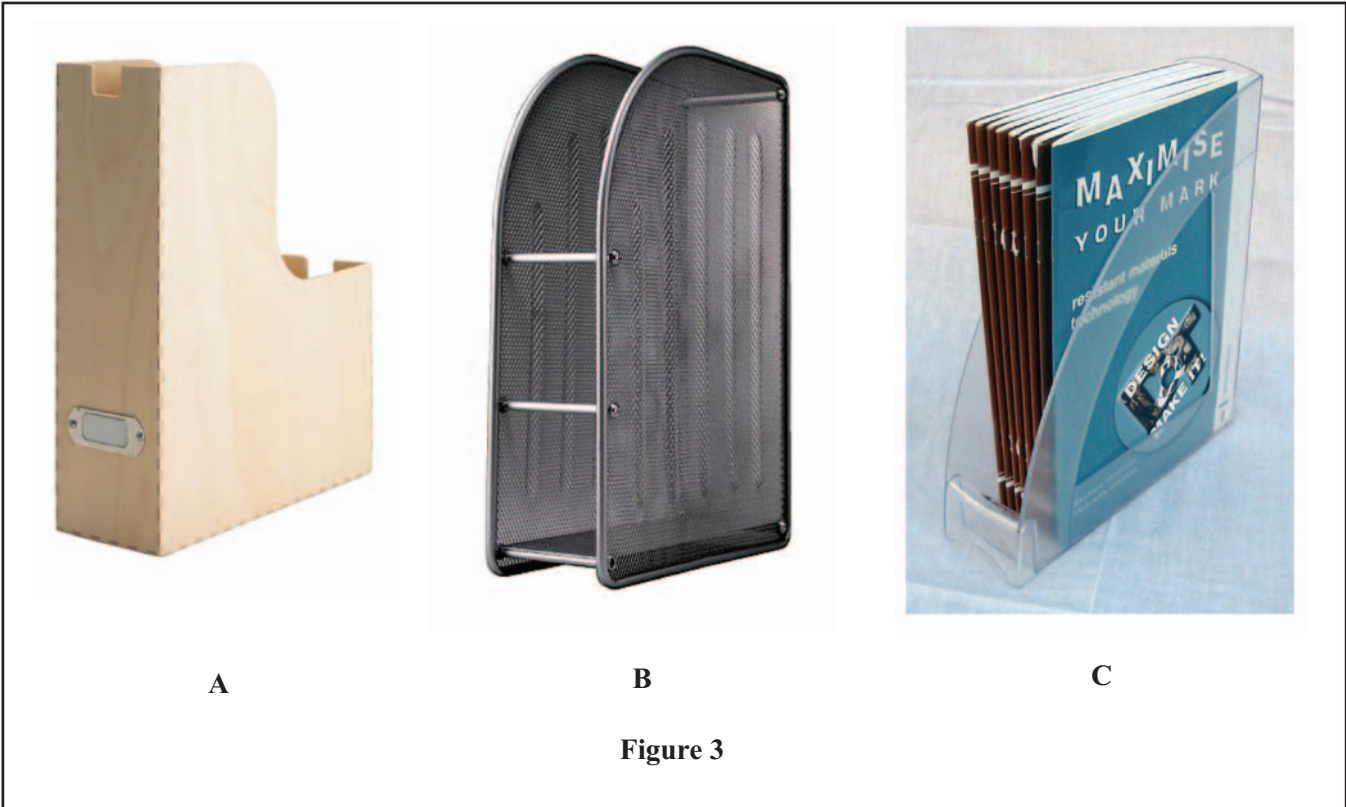
**Figure 1**

This insert page should **not** be sent to the examiner.

Turn over ►

**Insert to**

**3545/F**





**Figure 6**

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**Stapler 1**



**Stapler 2**

**Figure 8**

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—[www.imation.co.uk](http://www.imation.co.uk)

Figure 3—[www.NelsonThornes.com](http://www.NelsonThornes.com)

Figure 7—Screwfix Direct ([screwfix.com](http://screwfix.com))