FOR OFFICIAL USE

PRACTICE PAPER 1

Mark

Design and Manufacture

Duration — 1 hour and 30 minutes

SQ09N501

Fill in these boxes and read what is printed below.

Full name of centre

Town

Forename(s)

Surname

Number of seat

Date of birth
Day Month Year

D D M M Y Y

Scottish candidate number

Total marks — 60

SECTION 1 — 24 marks

Attempt ALL questions.

SECTION 2 — 36 marks

Attempt ALL questions.

Read every question carefully before you attempt it.

Write your answers, clearly in the spaces provided, using blue or black ink.

Show all working and units where appropriate.

Use sketches to illustrate your answer where appropriate.

Before leaving the examination room you must give this booklet to the invigilator.
If you do not, you may lose all the marks for this paper.

SECTION 1 - 24 marks
Attempt ALL questions

MARKS

DO NOT WRITE IN THIS MARGIN

1. A small storage container is shown below.

(a) The container was manufactured mainly from softwood.
State the name of **TWO** suitable softwoods that could have been used. **2**

_____

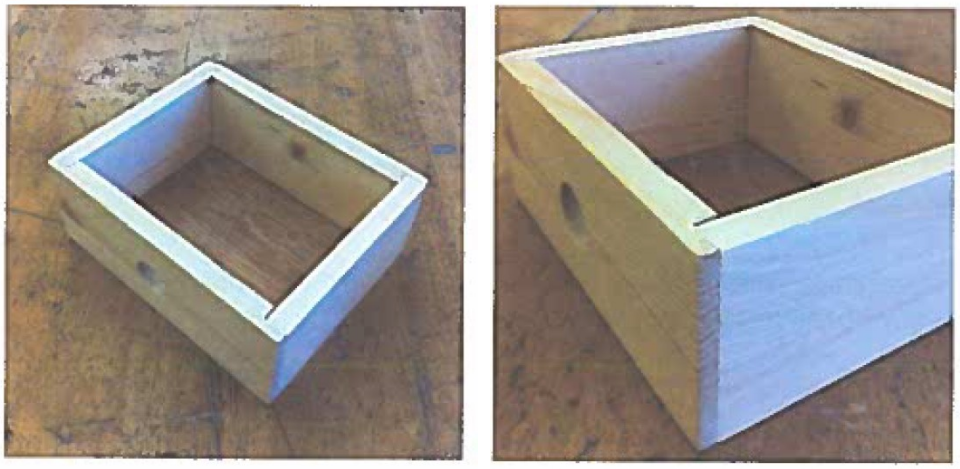
_____

(b) The back of the container is made from plywood as shown below.

(i) Describe the benefits of using plywood for the back of the container. **2**

(ii) State the names of two other manufactured boards that could have been used. **2**

(c) The drawer of the container is shown below,



(i) State the name of **TWO** suitable joining techniques that could have been used at each corner of the drawer. **2**

(ii) Describe, with reference to tools, the way that one of the joints you have named above could be manufactured in the workshop using hand tools. **3**

(c) The drawer has a 20mm diameter hole for opening instead of a handle.

(iii) Describe, with reference to tools and machinery, the way that the 20mm hole could have been manufactured in the workshop. **3**

The container has been finished in wax.

(d) Describe the benefits of using wax to finish the surfaces of the container. **2**

(e) The decorative plastic photo-frame shown below was added to the top of the container.

(i) Describe, with reference to tools, the way in which the four holes would have been marked out in the workshop. **3**

MARKS

DO NOT WRITE IN THIS MARGIN

(e) (iii) Describe the stages that would be carried out to make the edges of the plastic smooth and shiny. **4**

The screws used to join the plastic to the container were manufactured from a non-ferrous metal.

(iii) State the name of a suitable non-ferrous metal **1**

Total marks 24

SECTION 2 - 36 marks
Attempt ALL questions

MARKS

DO NOT WRITE IN THIS MARGIN

2. iPod docking stations are shown below.

Before producing a specification for an iPod docking station the designer would have to research various issues or factors.
With reference to an iPod docking station;

State four design issues which would have to be researched and explain why each of these design issues is important. **5**

MARKS

DO NOT WRITE IN THIS MARGIN

3. The ability to generate ideas is an important aspect of a designer's work

(a) State two idea generation techniques. **2**

(b) Describe how one of these techniques you have named above would be carried out by the designer. **2**

Total marks **4**

4. During the design process, a professional designer will use various materials to build simple models.

(a) State **two** reasons why the designer would build simple models. **2**

(b) State the name of **two** materials that could be used to produce a simple model and explain why each material is suitable. **4**

Total marks **6**

5. A toaster is shown below.

The manufacturer wishes to carry out an evaluation of the toaster.

Describe an evaluation activity that could be carried out for each of the following aspects of the toaster.

(NB - a different technique must be used for each aspect)

(a) Ease of use **2**

(b) Aesthetics **2**

(c) Value for money **2**

(d) The speed of toasting **2**

Total marks **8**

6. The computer desk shown below was supplied as a flat pack.

(a) State **two** advantages to the consumer of flat-packed furniture. **2**

(b) State two advantages of using beech veneered chipboard for the computer desk rather than using solid beech. **2**

(c) Knock-down fittings are often used in the construction of flat-packed furniture.
Explain the term *'knock down fittings'.* **1**

(d) Flat-packed furniture can be aimed at a particular market niche.
Explain the term *'market niche'* with reference to flat-packed furniture. **2**

Total marks **7**

7. A hand held game is shown below.

Describe how the design of the hand held game has been influenced by ergonomics.

Total marks **6**

[END OF PAPER]

DESIGN & MANUFACTURE

PRACTICE EXAM 1

SOLUTIONS

Prelim Question No.	Topic	Source	Question No.	Marks
1	Workshop general	Model Paper 1	1	24
2	Design Issues	Model Paper 2	2	5
3	Idea Generation	Model Paper 3	5	4
4	Model making	2007 Int 2 PD	5	6
5	Evaluation techniques	Model Paper 2	4	8
6	Flat pack furniture	Model Paper 2	6	7
7	Ergonomics	Model Paper 3	7	6
			TOTAL	60

N5 Design & Manufacture

PRACTICE EXAM SOLUTIONS / MARKING

QUESTION No. 1 Model Paper 1 - Q1

Section 1

1. (a) Pine, Spruce.

(b) (i) Plywood is strong in all directions and will not warp or bend after fitting.
(ii) MDF, hardboard.

(c) (i) Lap joint, dovetail joint.
(ii) Lap joint: after marking out the joint with a try square, marking gauge and rule, you would cut down halfway through the wood with a tenon saw. Then you would chisel out the waste wood with a bevel edged chisel. Finally you could use a hand router to smooth the bottom of the lap joint.
(iii) 20mm hole: after marking out with a rule and a try square, you would fit a forstener bit to the pillar drill. You would then drill slowly through the wood to make sure you don't split it at the back.

(d) Wax makes the container look good and it also makes it more durable and helps to protect the wood from rotting.

(e) (i) The four holes would have been marked out by using a rule, scriber and engineers square: the rule would be used to measure along the edge of the acrylic to the desired size, this would be marked by the scriber. Then the engineers square would be used with the scriber to mark out the positions of the holes.
(ii) There are four usual stages, these are cross file, draw file, wet and dry paper or block and finally applying polish with a cloth.
(iii) Brass.

QUESTION No. 2 Model Paper 2 - Q2

Section 2

2. The designer would research: **Function, ergonomics, durability and safety.**

- **Function:** Function is important because the designer needs to find out what the docking station could do. Such as volume and tone settings for the music.
- **Ergonomics:** The buttons need to be easily pressed and fit human hand sizes.
- **Durability:** The materials used to make the docking station should withstand regular use, such as buttons or controls.
- **Safety:** The connections to the power source should be safe and not endanger the user from electric shock.

One mark for the four issues, and one mark for each explanation

QUESTION No. 3 Model Paper 3 - Q5

5. (a) Morphological analysis, design stories.

One mark per correct response up to total of two marks.

(b) Morphological Analysis: MA is a technique that you use to generate ideas by making columns of words from which you can pick random selections. The columns are under different headings like shape, colour and theme. This gives you a range of aspects to include in your idea.

QUESTION No. 4 2007 Int. 2 Product Design - Q5

Question 5 (a)

"2 reasons for the designers to build simple models"

- Simple models are used to develop an idea by giving a three dimensional view of a concept
- Reference to quickness/speed
- Simple models can be used to test for ergonomic and aesthetic decision making.

Any suitable answer relating to simple modelling.

1 mark per correct response up to total of 2 marks. **(2)**

Question 5 (b)

"Two materials"

Possible materials range from plasticine and modelling clay through to plywood and acrylic. The suitable material must be linked to its properties that allow it to be modelled easily.

No marks are awarded for the correct naming of modelling materials

To gain marks in this section the candidate must name a suitable material and justify its suitability.

One material plus one justification is awarded one mark.

One material plus two justifications is awarded two marks.

Two materials plus four justifications is awarded four marks. **(4)**

QUESTION No. 5 Model Paper 2 - Q4

4. (a) **Ease of use:** user trial – toast a piece of bread and describe how easy it was to use the toaster.

   (b) **Aesthetics:** survey – ask a group of people if they like the colour used in the design of the toaster.

   (c) **Value for money:** comparison to other products – compare the price of other products that do the same job and see if the toaster is a reasonable selling price.

   (d) **Speed of toasting:** testing – time the toaster to see how long it takes to toast the bread and compare to other toasters.

QUESTION No. 6 Model Paper 2 - Q6

6. (a) Instant purchase
Easy to assemble
No delivery waiting
Low cost
Satisfaction of building
Easy to transport
Easy to store prior to assembly
Disassembly option, when not in use
Access to difficult property areas, such as up narrow staircases.

(b) Low cost
Environmental reasons
Uniformity of thickness
Smooth surfaces
Easy to machine
Wide flat boards
Knock Down Fittings are compatible
Uses materials that might be considered as waste.

(c) Special fittings to join furniture parts together
Mechanical fixing using standard components

(d) A market niche is a particular group of people that a product could be aimed towards. Flat pack furniture is low cost and has a limited life span. Young families with less income would be the ideal market niche for flat pack furniture.

QUESTION No. 7 Model Paper 3 - Q7

7. Candidates have three possible routes to go down in their response – anthropometrics, physiology and psychology.

There is no requirement to refer to any of these areas by name. Typical responses within each aspect are shown below. Six suitable responses will gain six marks.

Any suitable answer relating human dimensions and relevant aspect of the hand held game should be awarded one mark, e.g. the buttons have been designed to suit children's finger tip sizes.

Other suitable answer:
Pointer diameter – child grip diameter

Any suitable answer relating to human limitations, linking to part of the hand held game should be awarded one mark.

The use of physical action verbs linking to the use of the hand held games are to be looked for here, e.g. the hand held game screen is easy for a child to open.