FOR OFFICIAL USE

N5

National
Qualifications
SPECIMEN ONLY

Mark

S819/75/01 Design and Manufacture

Date — Not applicable

Duration — 1 hour 45 minutes

S8197501

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

Scottish candidate number

Total marks — 80

SECTION 1 — 60 marks

Attempt ALL questions.

SECTION 2 — 20 marks

Attempt ALL questions.

Write your answers clearly in the spaces provided in this booklet. Additional space for answers is provided at the end of this booklet. If you use this space you must clearly identify the question number you are attempting.

Show all working and units where appropriate.

Use **blue** or **black** ink.

Before leaving the examination room you must give your answer booklet to the Invigilator; if you do not, you may lose all the marks for this paper.

S8197501 01

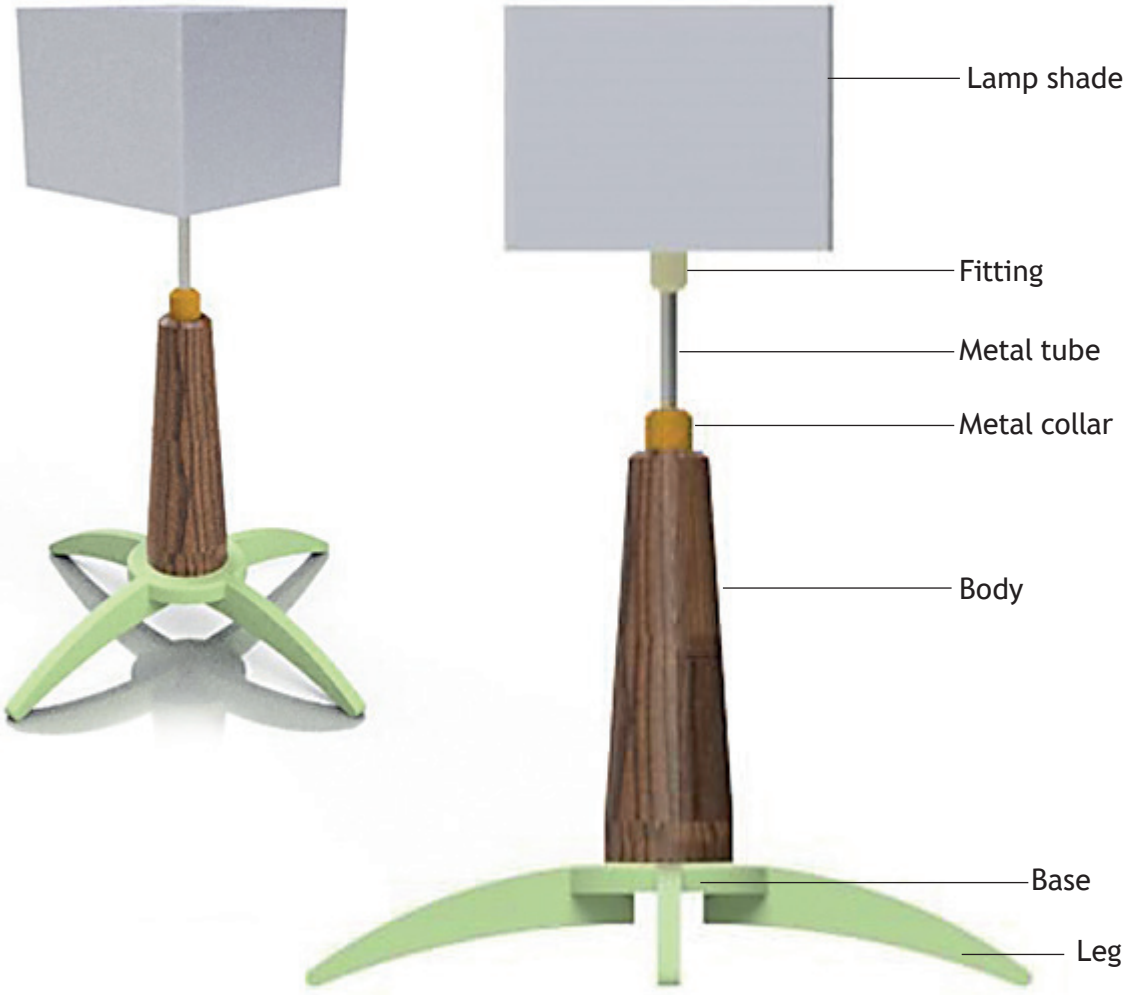
SQA ©

SECTION 1 — 60 marks

Attempt ALL questions

MARKS | DO NOT WRITE IN THIS MARGIN

1. A design proposal for a table lamp is shown below.



(a) The lamp is made from different materials.

(i) Name a suitable dark coloured hardwood for the body of the lamp. **1**

_____

(ii) Name a suitable yellow-coloured alloy for the metal collar. **1**

_____

1. (continued)

(b) The body of the lamp will be manufactured on a wood turning lathe.

Outline **two** safety checks that must be carried out on the wood turning lathe before the body is manufactured. **2**

_____

_____

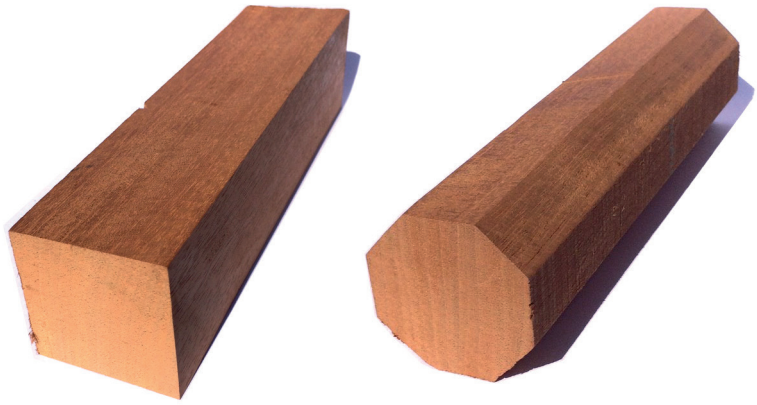
_____

_____

[Turn over

1. (continued)

(c) A wood turning blank is required for the body of the lamp.

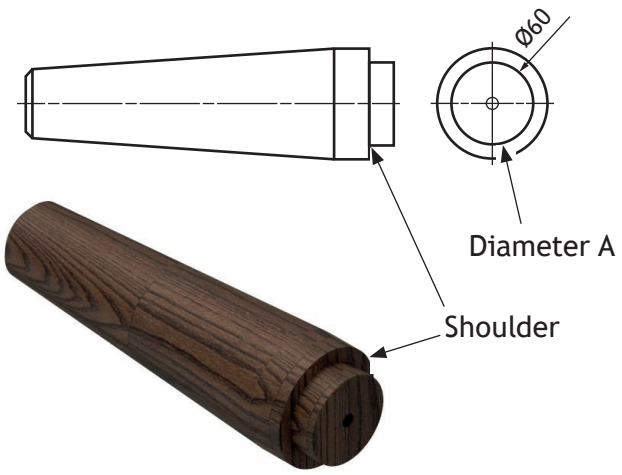


(i) Describe how to mark out **and** remove the corners of the blank in preparation for turning. You must refer to workshop tools in your answer.

(*Sketches may be used to illustrate your answer.*) **4**

1. (c) (continued)

A shoulder has been turned accurately to the sizes shown on the drawing. The shoulder will join the body to the base.



(ii) Name the lathe tool that should be used to create the shoulder. **1**

_____

(iii) Name a hand tool that could be used to check diameter A is 60 mm. **1**

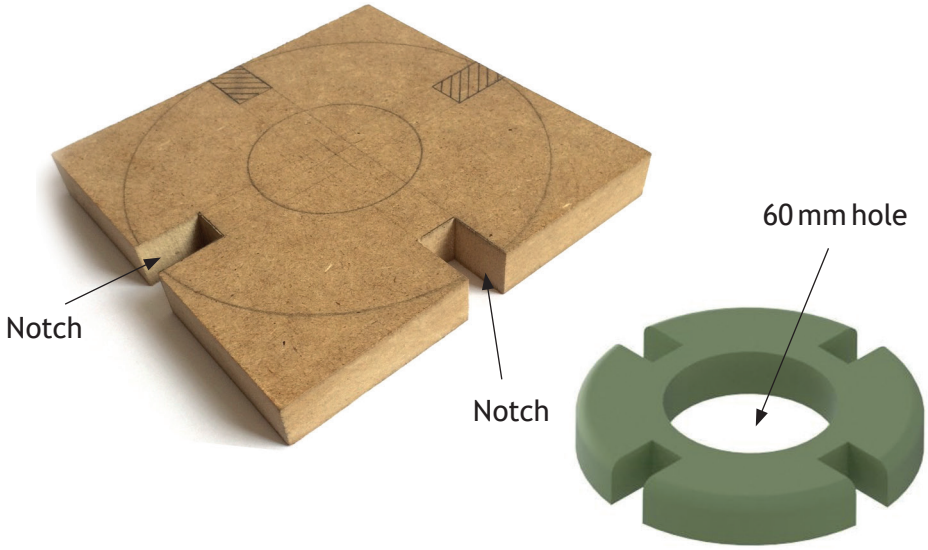
_____

[Turn over

1. **(continued)**

MARKS | DO NOT WRITE IN THIS MARGIN

(d) The part of the base shown below was cut and shaped from MDF.

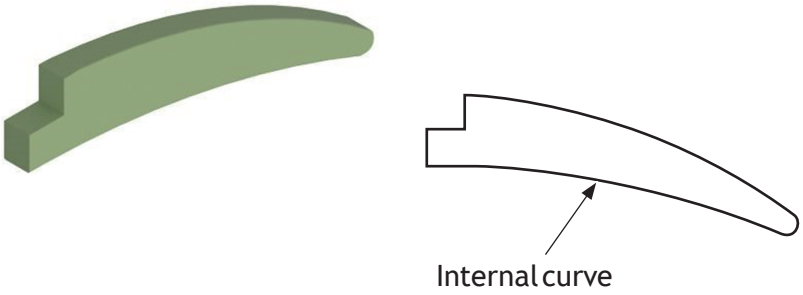


(i) Describe how the notches to join the legs could be cut out accurately, with reference to workshop tools.
(*Sketches may be used to illustrate your answer.*) **2**

1. (d) (continued)

(ii) Name the drill bit that could be used to drill the 60 mm hole. **1**

(e) A template was used to mark out the four MDF legs of the base.



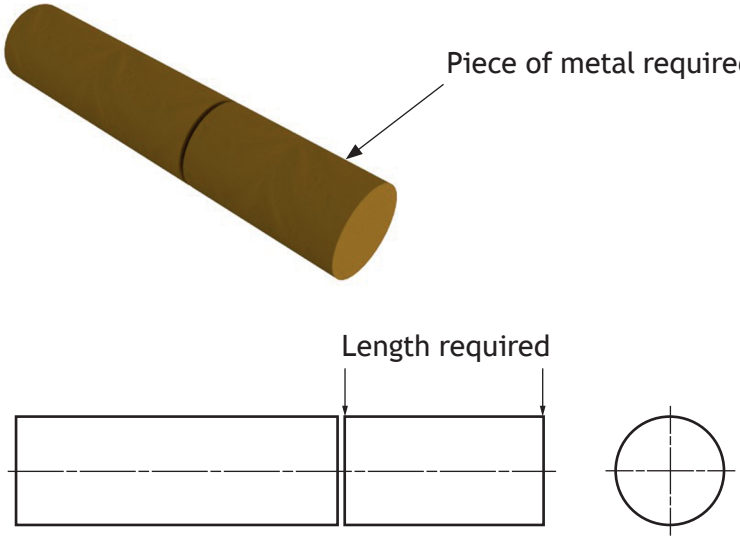
(i) Explain **two** reasons for using a template to mark out the legs. **2**

(ii) Name the hand tool that would be used to cut the internal curve. **1**

[Turn over

1. (continued)

(f) The metal to make the collar was cut to length then turned on a centre lathe.



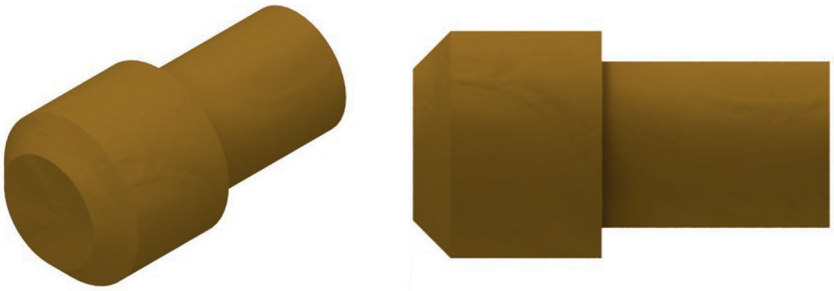
(i) Name the vice that should be used to hold the metal while it is being cut. **1**

_____

(ii) Name a hand tool that could be used to cut the metal to length. **1**

_____

Before the metal collar was drilled, a number of processes were carried out on the centre lathe.



1. (f) (continued)

(iii) Name **three** processes that would be carried out on a centre lathe to manufacture the metal collar. **3**

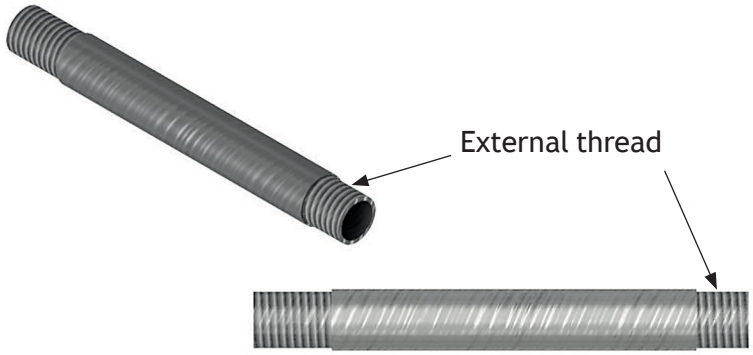
(g) A hole was drilled to allow an internal thread to be cut.

(i) Explain why a centre drill has to be used before the hole can be drilled. **1**

[Turn over

1. (g) (continued)

An external thread was cut at both ends of the metal tube. This allows the light fitting to attach to the collar of the lamp.



(ii) Name the hand tool that would be used to cut the external thread. **1**

_____

(iii) It is important that a good quality thread is cut. Describe how this can be done. **2**

_____

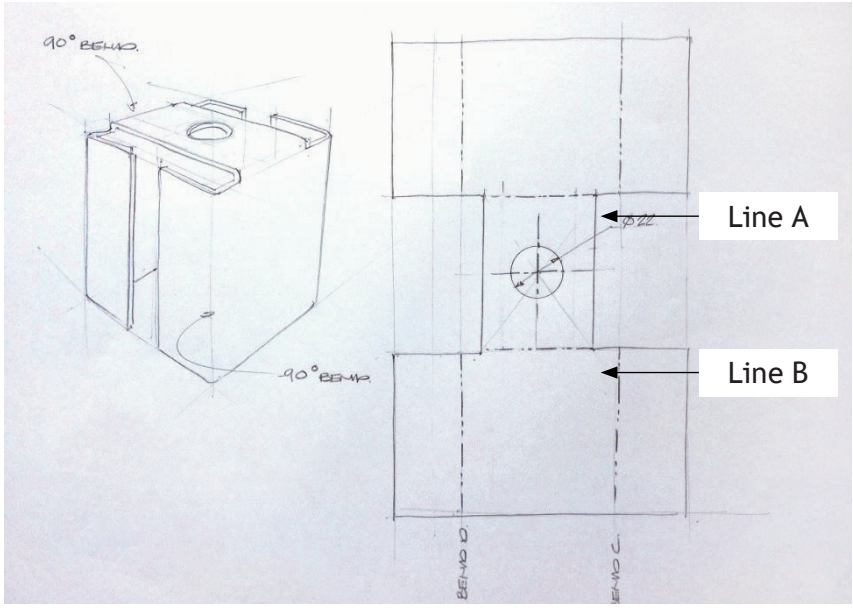
_____

_____

_____

1. (continued)

(h) Sketches were produced to help plan the tasks required to manufacture the lamp shade.



The lamp shade is manufactured from acrylic.

(i) State **two** reasons why acrylic is a suitable choice for the lamp shade. **2**

(ii) The acrylic has to be heated before forming the 90 degree bends. State the name of the equipment that should be used to heat the acrylic along lines A and B. **1**

(iii) The edges of the acrylic were finished before the lamp shade was formed. Explain why the edges of the acrylic should be finished before it is formed into shape. **2**

2. Designers used research to improve the design of the electric scooter shown below.

Designers often use research techniques such as user trips and questionnaires to gather different information:

(a) Outline **one** piece of information that could be gained about the electric scooter from the research techniques below.

(*A different piece of information must be outlined for each technique.*)

(i) a user trip **1**

_____

(ii) a questionnaire **1**

_____

2. (continued)

(b) Select **one** of these research techniques from the options below. Tick the box (✓).

☐ User trip

☐ Research questionnaire

Describe key stages for the research technique you have selected. **3**

Designers often use a specification when developing a design proposal.

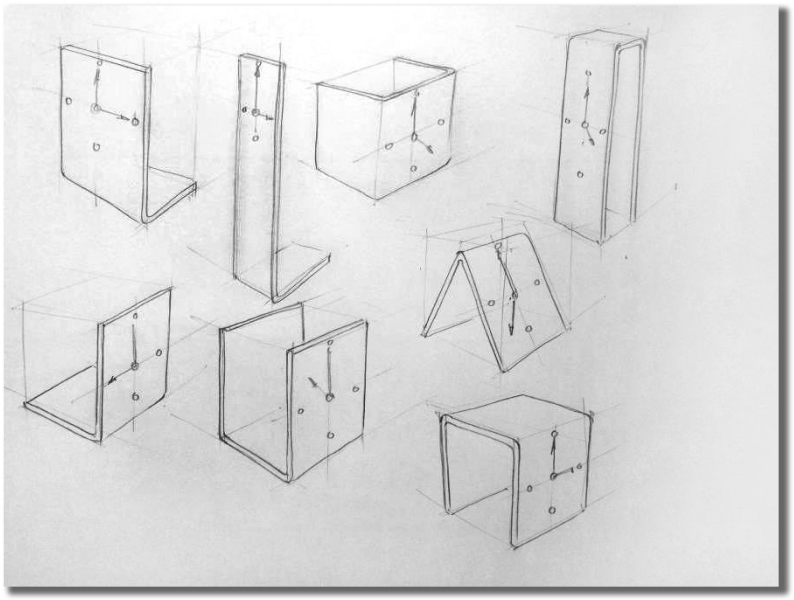
(c) Describe how a specification could be used during the exploration and refinement stages of the design process. **2**

Exploration:

Refinement:

[Turn over

3. A page of initial ideas for a clock design is shown below.



The designer could have used morphological analysis or brainstorming to generate a range of ideas.

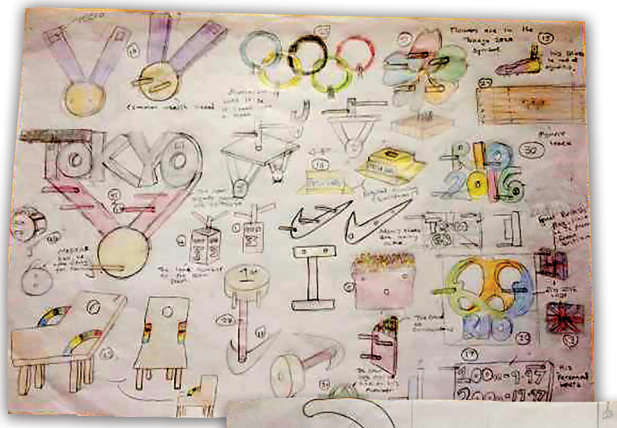
Select **one** of the idea generation techniques from the options below. Tick the box (✓).

☐ Morphological analysis

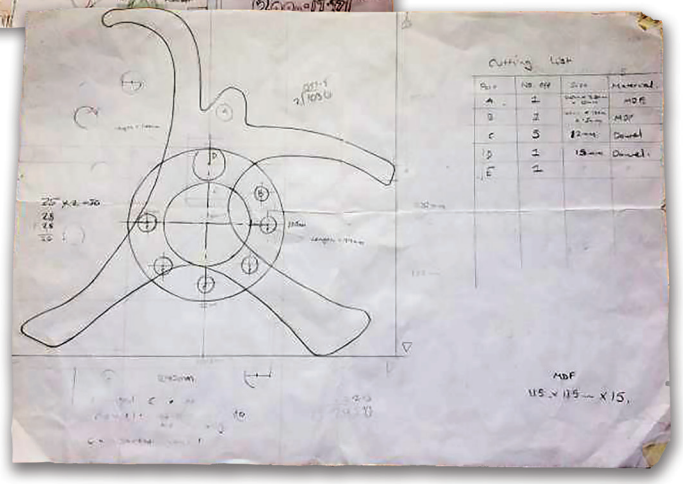
☐ Brainstorming

Describe the key stages of **one** of these idea generation techniques. **3**

4. Sketches and drawings are used at different stages of the design process.



Initial ideas



Working drawings

(a) Explain why sketching is a suitable technique to use when generating ideas. **2**

4. (continued)

(b) Describe the reasons for producing working drawings. **2**

5. Different types of models can be used throughout the design process.

Block Model CAD Model

(a) Outline **two** reasons for using block models during the design process. **2**

(b) Outline **two** reasons for using CAD models when presenting ideas to the client. **2**

6. Designers will have considered a range of design factors when designing the child's trike below.

(a) Describe how the use of anthropometrics data has influenced the sizes of the trike. You should refer to specific data and parts of the trike in your answer. **4**

6. (continued)

(b) To be a commercial success the trike has to appeal to both children and parents.

(i) Outline **two** reasons why the aesthetics of the trike would appeal to children. **2**

(ii) Outline **two** reasons other than aesthetics that would make the trike appealing to parents. **2**

7. (a) Technology push has led to an increased number of gadgets to control the modern home.

Describe what is meant by technology push. **2**

(b) Describe the benefits of launching a new product under a successful brand name. **2**

[Turn over

8. The pencil case and its contents shown below have been mass produced using a range of materials and processes.

Materials

- ABS
- Polystyrene
- Polypropylene
- Acrylic
- Urea formaldehyde
- Melamine formaldehyde

(a) Select a material from the list provided and explain why it would be suitable for the items below.

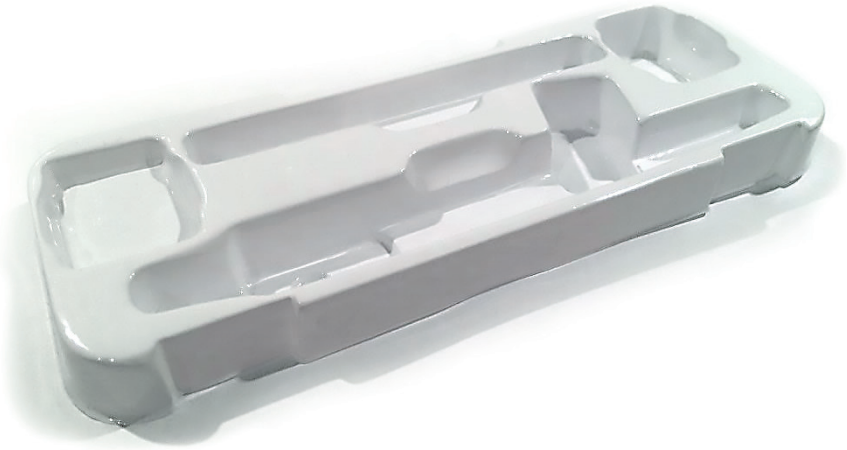
(*A different material must be selected for each item.*)

(i) Ruler **2**

(ii) Case lid **2**

8. (continued)

The case insert was manufactured by vacuum forming.



(b) The pattern contains the following features. State a manufacturing reason for each.

(i) Rounded edges **1**

_____

(ii) Vent holes **1**

_____

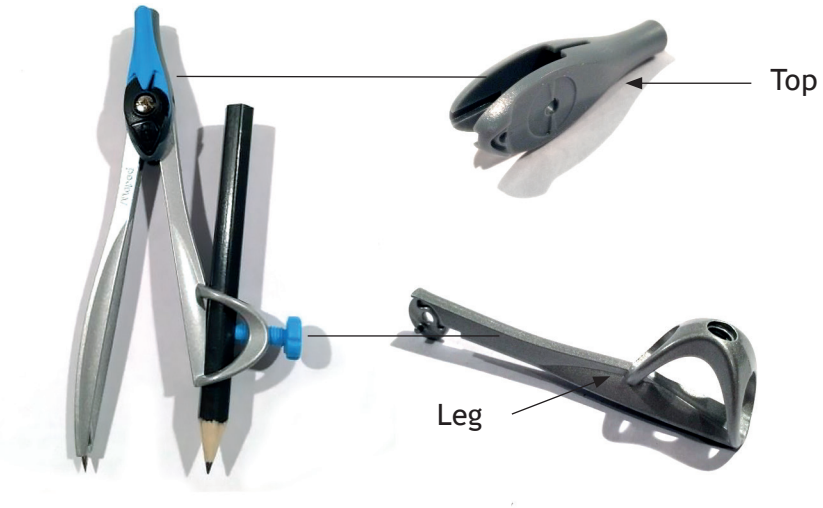
(iii) Tapered sides **1**

_____

[Turn over

8. (continued)

The set of compasses shown below has been mass produced using different materials and processes.



The top of the set of compasses was created by injection moulding.

(c) State **two** identifying features that would show this. **2**

_____

_____

The legs of the set of compasses are made from a metal alloy.

(d) Name a suitable mass production process to manufacture the legs. **1**

_____

9. Computer aided manufacture (CAM) is widely used in mass production.

Explain **two** reasons for using CAM to mass produce products. **2**

10. Many furniture companies design their furniture incorporating standard components such as knock-down fittings.

Describe the benefits to the consumer **and** the manufacturer of using knock-down fittings. **3**

11. Manufacturing technologies are widely used by companies to mass produce affordable products. These technologies can impact on the environment and the workforce.

(a) Describe **one** benefit and **one** drawback that manufacturing technologies have had on the workforce. **2**

Benefit:

_____

_____

Drawback:

_____

_____

[Turn over

11. (continued)

(b) Describe **three** ways that manufacturing technologies impact on the environment. **3**

[END OF SPECIMEN QUESTION PAPER]

MARKS | DO NOT WRITE IN THIS MARGIN

ADDITIONAL SPACE FOR ANSWERS

MARKS | DO NOT WRITE IN THIS MARGIN

ADDITIONAL SPACE FOR ANSWERS

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National
Qualifications
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S819/75/01 Design and Manufacture

Marking Instructions

These marking instructions have been provided to show how SQA would mark this specimen question paper.

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General marking principles for National 5 Design and Manufacture

This information is provided to help you understand the general principles you must apply when marking candidate responses to questions in this paper. These principles must be read in conjunction with the specific marking instructions for each question. The marking schemes are written to assist in determining the "minimal acceptable answer" rather than listing every possible correct and incorrect answer.

(a) Marks for each candidate response must always be assigned in line with these general marking principles and the the specific marking instructions for the relevant question.

(b) Marking should always be positive, ie marks should be awarded for what is correct and not deducted for errors or omissions.

(c) If a specific candidate response does not seem to be covered by either the principles or specific marking instructions, and you are uncertain how to assess it, you must seek guidance from your team leader.

(d) To be awarded marks candidates must respond to the command word used in the question. For example, listing a valid point, even if correct, should not be awarded marks if the question asked for an outline, description or explanation.

(e) Mark consecutive responses to match the marks in 'name/state' questions. For example, if two responses are given to a one mark question, only the first response should be marked.

(f) Candidates must answer all aspects of the question to gain full marks. For example, if the questions require two reasons candidates must make two valid and substantiated points relating to the question to gain both marks. If the questions require three stages to be described, candidates must provide a structure of characteristics and/or features of each of the three stages to be awarded all three marks.

(g) For each candidate response, the following provides an overview of the marking principles. Refer to the specific marking instructions for further guidance on how these principles should be applied.

(i) Questions that ask candidates to **name/state**
Candidates must provide the answer in brief form/name. Candidates will normally be required to make the same number of statements as marks available in the question.

(ii) Questions that ask candidates to **outline**
Candidates must provide a brief sketch of content. More than naming, but not a detailed description. Candidates will normally be required to make the same number of factual/appropriate points as marks available in the question.

(iii) Questions that ask candidates to **describe**
Candidates must provide a statement or structure of characteristics and/or features. This should be more than an outline or a list. Candidates may refer to, for instance, a concept, experiment, situation, or facts in the context of, and appropriate to, the question. Candidates will normally be required to make the same number of factual/appropriate points as marks available in the question.

(iv) Questions that ask candidates to **explain**
Candidates must generally relate cause and effect and/or make relationships between things clear. This will be related to the context of the question or a specific area within a question.

Marking instructions for each question

Section 1

Question			Expected answer(s)	Max mark	Additional guidance
1.	(a)	(i)	Name any one of the following: • mahogany • teak • sapele • cherry • walnut **Any other suitable response**	**1**	One mark for correct response.
		(ii)	Name any one of the following: • brass • bronze	**1**	One mark for correct response.
	(b)		Outline any **two** safety checks on the wood lathe. • blank centred • blank secured between centres • tool rest secure • tool rest at correct height • clearance between tool rest and blank	**2**	One mark for each correct response up to a maximum of two marks. Marks can only be awarded for checks on the woodworking lathe. No marks should be awarded for reference to personal safety or protective equipment.
	(c)	(i)	A description that includes four of the following: • using a rule to draw diagonal lines to find centre on the ends of work piece • using a set of compasses to draw circle/construct octagon • using marking gauge to mark out corners to be removed • holding work piece in bench vice when removing corners • using smoothing plane to remove corners • using centre punch to mark centres at both ends of the blank	**4**	To be awarded marks candidates must provide a **description** when answering this question. One mark for each valid point or effective sketch leading to a clear description, up to a maximum of four marks. To gain the full four marks, both marking out and removing the corners must be included in the description. Description must reference workshop tools used to mark out and remove the corner.
		(ii)	• parting tool	**1**	One mark for correct response. No marks should be awarded for skew or roughing tool.

Question			Expected answer(s)	Max mark	Additional guidance
		(iii)	Name any one of the following: • outside callipers • vernier callipers	1	One mark for correct response. Marks can be awarded for micrometre — although not a woodworking tool it can be used for checking an outside diameter.
	(d)	(i)	Description of how to cut out the notches identified with workshop tools. Typical responses are likely to include reference to: • cutting parallel lines with a tenon saw or jig saw. • removing waste with a jig saw or bevel-edged chisel	2	To be awarded marks candidates must provide a **description** when answering this question. One mark for each valid point or effective sketch leading to a clear description, up to a maximum of two marks. Description must reference workshop tools used to cut and remove waste.
		(ii)	Name any one of the following: • Forstner drill • hole saw	1	One mark for correct response.
	(e)	(i)	An explanation that includes two of the following reasons. • accurate repeatability as you are drawing around the same template • saves time as complex shape only has to be drawn once • complex curves would be difficult to mark out with marking out tool • efficient positioning on material will reduce waste • if a mistake is made while cutting it can be marked out again quickly • can be used to check accuracy of parts once they have been cut out	2	To be awarded marks candidates must provide an **explanation** when answering this question.
		(ii)	Coping saw	1	One mark for correct response. No marks should be awarded for naming machine tools.

Question			Expected answer(s)	Max mark	Additional guidance
	(f)	(i)	Engineer's vice	**1**	One mark for correct response. No marks should be awarded for generic 'vice'.
		(ii)	Name any one of the following: • Hacksaw • Junior hacksaw	**1**	One mark for correct response.
		(iii)	State any three of the following: • Facing • Parallel turn • Step turn • Chamfer	**3**	One mark for each correct response up to a maximum of three marks.
	(g)	(i)	An explanation that includes any one of the following: • improves accuracy as the centre drill does not flex or move when drilling • stopping twist drill from wandering off centre as the centre drill creates a small counter-sunk hole	**1**	One mark for correct explanation. To be awarded marks candidates must provide an **explanation** when answering this question.
		(ii)	Name any one of the following: • Split die • Die	**1**	One mark for correct response.
		(iii)	A description that includes two of the following: • use of cutting compound • accurate alignment • chamfering the end • half turn forward, quarter turn back • adjusting the split die	**2**	To be awarded marks candidates must provide a **description** when answering this question. One mark for each valid point leading to a clear description, up to a maximum of two marks.

Question			Expected answer(s)	Max mark	Additional guidance
	(h)	(i)	State any two of the following: • translucent – suited to emitting light • can be formed into shape required • heat resistant to 200 degrees • polishes well • rigid, holds it shape • can be drilled and cut to shape required **Any other suitable response**	**2**	One mark for each correct response, up to a maximum of two marks.
		(ii)	Strip heater	**1**	One mark for correct response.
		(iii)	An explanation that includes any two of the following: • it will be quicker because it is easier to finish the flat edges before the shade is formed • it will be quicker and easier because there are less corners and awkward parts to finish • it is simpler to hold and clamp when it is a flat shape • the acrylic is less likely to snap because it can be held securely	**2**	To be awarded marks candidates must provide an **explanation** when answering this question. One mark for each valid point leading to a clear explanation, up to a maximum of two marks.

Question			Expected answer(s)	Max mark	Additional guidance
2.	(a)	(i)	Outline must reference information gained from a user trip, ie gained from personal experience. Outline of any of the following: • ease of use • how it works • how it performs on different surfaces • how long it takes to charge • important design features • areas for improvement • ease of maintenance **Any other suitable response**	**1**	To be awarded marks candidates must provide an **outline** when answering this question. One mark for providing a brief summary of content. A detailed description is not needed.
		(ii)	Outline must reference information gained from a questionnaire, ie gained from sources other than personal use. Outline of any of the following: • opinions on aesthetic appeal • opinions on price • age of the user • where it is most likely to be used • likes and dislikes **Any other suitable response**	**1**	To be awarded marks candidates must provide an **outline** when answering this question. One mark for providing a brief summary of content. A detailed description is not needed.

Question			Expected answer(s)	Max mark	Additional guidance
	(b)		A description of the key stages of a **user trip** or **questionnaire** that includes any three of the following: Typical responses for a **user trip** could include reference to: • preparation — plan the user trip, consider purpose of user trip, what information is required from the user trip, read instruction and find out how to use product, identify important stages in using the product, eg install, use and storage • undertaking — use at each stage, eg unpacking and installing, use, maintenance storage. Use in all possible conditions and environments • collating — record and analyse information from user trip Typical responses for a **questionnaire** could include reference to: • preparation — consider the target market when wording questions, identify what information is required, write and trial questions, amend question after trial if required	**3**	To be awarded marks candidates must provide a **description** when answering this question. One mark for each valid point leading to a clear explanation, up to a maximum of three marks.

Question			Expected answer(s)	Max mark	Additional guidance
			• conducting – make sure target mark answers the questionnaire. Ensure questionnaires are completed and returned on time, ensure sufficient questionnaires have been completed • collating – record and analyse information from questionnaire		
	(c)		A description that includes two of the following: • provides direction to exploration and refinement • improves decision making as a result of evaluation against specification • allows most promising ideas to be identified/taken forward • identifies important factors to consider in the development and refinement	**2**	To be awarded marks candidates must provide a **description** when answering this question. One mark for each valid point leading to a clear description, up to a maximum of two marks.

Question			Expected answer(s)	Max mark	Additional guidance
3.			Description of the key stages of brainstorming or morphological analysis that includes any three of the following: Typical responses for **brainstorming** could include reference to: • planning – identify the purpose of the brainstorming session, consider the size of the group, invite suitable people to take part • conducting – get group to rephrase the question, have a warm-up session, establish rules, set a time limit, avoid moments of silence and maintain momentum, record every thought • summary – discuss most unusual ideas, disregard weakest ideas, and identify most promising ideas Typical responses for **morphological** could include reference to: • planning – analysis of problem/product, identify factors that will be/are important to solving the problem or improving the product, generate a range of different options for each factor, produce a matrix • using – randomly or systematically select an option from each factor to produce different alternatives • summary – disregard weakest ideas, and identify most promising ideas	**3**	To be awarded marks candidates must provide a **description** when answering this question. One mark for each valid point leading to a clear description, up to a maximum of three marks.

Question			Expected answer(s)	Max mark	Additional guidance
4.	(a)		Explanation including any of the following. • sketches can be produced quickly which allows lots of ideas to be produced in a short time • you are not limited or constrained by computer software • as sketches are quick to produce they can be changed, altered or discarded • you do not need any specific information, ideas can emerge naturally **Any other suitable response**	**2**	To be awarded marks candidates must provide an **explanation** when answering this question. One mark for each valid point leading to a clear explanation, up to a maximum of two marks.
	(b)		Description must include two of the following: • allows information to be communicated to production team • allows dimensions in order to provide cutting lists • communicates construction details of different component parts • can be used to work out costings • helps planning for manufacture **Any other suitable response**	**2**	To be awarded marks candidates must provide a **description** when answering this question. One mark for each valid point leading to a clear description, up to a maximum of two marks.

Question			Expected answer(s)	Max mark	Additional guidance
5.	(a)		Outline two reasons from the following: • physical interaction gives feedback on ergonomics • it can be given to others to test and evaluate • can be altered and refined as feedback is gained • provides better understanding of 3D form • provides better understanding of faults and how to improve them	**2**	To be awarded marks candidates must provide an **outline** when answering this question, eg a brief summary of content. A detailed description is not needed. One mark for each reason outlined, up to a maximum of two marks.
	(b)		Outline two reasons from the following: • good detail and clarity will impress the client • improves presentation as different views and versions can be created once the original model has been created • can be rotated and animated which could provide clarity to the client • can be used in video conferencing/virtual presentations • can be produced and altered quickly which means changes could be made during presentation with client • accurate representation of materials and textures will improve communication with client	**2**	To be awarded marks candidates must provide an **outline** when answering this question, eg a brief summary of content. A detailed description is not needed. One mark for each reason outlined, up to a maximum of two marks.

Question			Expected answer(s)	Max mark	Additional guidance
6.	(a)		Description must reference how anthropometrics may have influenced the trike. Typical responses could include reference to: • position of pedals in relation to leg length • height of seat in relation to popliteal height • height of crossbar in relation to leg length • size of seat in relation to hip width • position of handle bars in relation to reach • diameter of handle bars in relation to grip • width of handle bars in relation to shoulder width • length of grips in relation to hand width **Any other suitable response**	**4**	Answers must provide a clear link between anthropometrics and aspects of the trike. One mark for each valid point leading to a clear description, up to a maximum of four marks. No marks should be awarded for generic statements about anthropometrics.
	(b)	(i)	Outline two reasons from the following: • bright • colourful • friendly • fun **Any other suitable response**	**2**	To be awarded marks candidates must provide an **outline** when answering this question, eg a brief summary of content. A detailed description is not needed. One mark for each reason outlined, up to a maximum of two marks.

Question			Expected answer(s)	Max mark	Additional guidance
		(ii)	Outline two reasons from the following: • safety • price • stability • easy to use • ease of maintenance • durability **Any other suitable response**	**2**	To be awarded marks candidates must provide an **outline** when answering this question, eg a brief summary of content. A detailed description is not needed. One mark for each reason outlined, up to a maximum of two marks.
7.	(a)		A description that includes two of the following: • research into new materials pushes the development on new products • research into new technology pushes the development on new products • research into new production methods pushes the development on new products • innovative technology generates new products • new products are created that are not based on market research	**2**	To be awarded marks candidates must provide a **description** when answering this question. One mark for each valid point leading to a clear description, up to a maximum of two marks.
	(b)		A description that includes two of the following: • established name • reputation • guaranteed sales • ease of advertising • premium pricing • customer loyalty	**2**	To be awarded marks candidates must provide a **description** when answering this question. One mark for each valid point leading to a clear description, up to a maximum of two marks.

Section 2

Question			Expected answer(s)	Max mark	Additional guidance
8.	(a)	(i)	Select a suitable material: • acrylic An explanation that includes one of the following: • clear — see through to measure things better • durable — gets used a lot and should not wear easily • hard — provides a good edge for drawing • impact resistant — rulers get dropped and misused • suitable for injection moulding **Any other suitable response**	**2**	One mark for selection of an appropriate material from the list provided in the question. One mark for a valid point explaining its suitability.
		(ii)	Select a suitable material: • polypropylene An explanation that include one of the following: • impact resistant — lid gets bashed and dropped • flexible — live hinge on lid, instruments get pushed into lid • transparent — can see contents • scratch resistant — gets put in and out of bag and could get scratched • suitable for injection moulding **Any other suitable response**	**2**	One mark for selection of an appropriate material from the list provided in the question. One mark for a valid point explaining its suitability.
	(b)	(i)	• reduces stress • stops thinning • retains material thickness • reduces risk of insert sticking to the pattern	**1**	One mark for correct manufacturing reason.

Question			Expected answer(s)	Max mark	Additional guidance
		(ii)	• ensures no air is trapped in corners • ensures vacuum is created in internal parts of the insert • ensures internal corners are formed accurately	**1**	One mark for correct manufacturing reason.
		(iii)	• reduces risk of plastic sticking to the pattern • ease of removing the pattern	**1**	One mark for correct manufacturing reason.
	(c)		State any two of the following: • injection marks • ejection marks • flashing • good surface finish • accuracy • complexity	**2**	One mark for each identification feature of injection moulding, up to a maximum of two marks.
	(d)		Die casting	**1**	One mark for correct process.
9.			• reduces work force as work is automated • reduces lead time as less tooling is required • increased efficiency as machines can run 24 hours a day • speeds up production as tools run at a higher speed • flexibility as machines can be programmed to do different tasks • is suitable for small production runs as less tooling is required • provides consistency as each part is manufactured identically **Any other suitable response**	**2**	One mark for each reason explained, up to a maximum of two marks.

Question			Expected answer(s)	Max mark	Additional guidance
10.			Description of benefits of knock-down fittings to the **consumer,** including any of the following: • as the furniture is supplied unassembled (flat pack), the furniture can be transported from the shop or manufacturer easily • consumers can take their goods home on the day and do not have to plan or pay for delivery • reduction in manufacturing costs can be passed on to the consumer making furniture more affordable • furniture can be assembled in situ allowing large pieces of furniture to be fitted into smaller spaces • no requirement for tools or equipment as tools are supplied with flat pack furniture **Any other suitable response** Description of benefits of knock-down fittings to the **manufacturer** including any of the following: • reduces the cost of production • reduced need for skilled workforce • increased use of automation as parts and assembly can be simplified • no requirement to assemble product • less stages in a product's manufacture • easier to quality control **Any other suitable response**	**3**	To be awarded marks candidates must provide a **description** when answering this question. One mark for each valid point leading to a clear description, up to a maximum of three marks. To gain full marks, benefits to both consumer and manufacturer must be described, eg Two valid points describing benefits to customer and one valid point describing benefits to manufacturer would gain three marks. Or One valid point describing benefits to customer and two valid points describing benefits to manufacturer would gain three marks.

Question			Expected answer(s)	Max mark	Additional guidance
11.	(a)		A description of one benefit of manufacturing technologies on the workforce that includes one of the following: • highly trained workforce • transferable skills • safer working environment • improved working conditions **Any other suitable response** A description of one drawback of manufacturing technologies on the workforce that includes one of the following: • reduction in workforce • deskilling of workforce • loss of traditional skills **Any other suitable response**	**2**	One mark for describing a benefit of manufacturing technologies on the workforce. One mark for describing a drawback of manufacturing technologies on the workforce. Candidates must describe one benefit and one drawback to gain full marks.
	(b)		A description that includes three of the following: • pollution • waste • sustainability • recycling	**3**	One mark for each valid point leading to a clear description, up to a maximum of three marks. Candidate could describe positive **or** negative impact on the environment, or a combination of both.

[END OF SPECIMEN MARKING INSTRUCTIONS]