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# **MARKING SCHEME**

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**LEVEL 1/2 AWARD IN ENGINEERING  
9793/01**

**SUMMER 2018**

## **INTRODUCTION**

This marking scheme was used by WJEC for the 2018 examination. It was finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conference was held shortly after the paper was taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conference, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about this marking scheme.

**LEVEL 1/2 AWARD IN ENGINEERING**

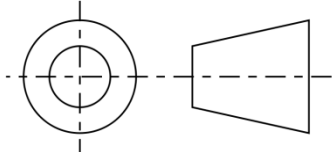
**MARK SCHEME - SUMMER 2018**

Question	Answer	Marks
1. (a) (i)	<p>One mark available.</p> <p>Every part manufactured will be identical. Available in various colours. Complicated shaped parts can be manufactured. Speed of manufacture. Cost. Hi volume production. Hi quality surface which requires very little finishing.</p> <p>Accept any reasonable answer that is appropriate.</p>	1
1. (a) (ii)	<p>One mark available.</p> <p>Expensive initial cost of manufacturing the moulds. If the mould is faulty, it will affect every manufactured part. When a new design is introduced, the moulds become obsolete. Moulds will in time wear and need replacing.</p> <p>Accept any reasonable answer that is appropriate.</p>	1
1. (b)	<p>One mark for each correct answer.</p> <p>High quality finish. Gives the handle a professional look. Simple to shape (pressed). Can be recycled at the end of the products' life. It's lightweight, so doesn't add much weight to the product. If a comparison is made between the plastic and the metal accept answers related to rigidity.</p> <p>Accept any reasonable answer that is appropriate.</p>	2
1. (c) (i)	<p>One mark available.</p> <p>Nylon. Polystyrene.</p>	1
1. (c) (ii)	<p>One mark available.</p> <p>Urea Formaldehyde. Polyester Resin.</p>	1

Question	Answer	Marks
1. (d)	<p>One mark for the characteristic or property, and a further mark for the explanation.</p> <p>Transparent – User can see when the water level goes down.            Good impact resistance – Will withstand impact if dropped on the floor.            Durable – It will be taken out to be re-filled with water, and replaced a number of times during the products' life.            Easily cleaned – Can be washed with all other kitchen utensils.            Hardwearing – Can used repeatedly.            Heat resistance. -Will retain shape when hot liquid is held in the vessel.</p> <p>Accept any reasonable answer that is appropriate.</p>	2
1. (e)	<p>Corrosion resistant.            Hardwearing.            Aesthetic finish.            Recyclable.            Readily available.            Easily manufactured.</p> <p>Accept any reasonable answer that is appropriate.</p> <p>Exemplar answer:</p> <p>Stainless steel is hardwearing. <span style="float: right;">1 mark</span></p> <p>Stainless steel is hardwearing and is able to withstand the daily/regular use of ceramic mugs being placed on the tray. <span style="float: right;">2 marks</span></p>	2
1. (f)	<p>Up to 4 marks available</p> <p>Push switch (1), to turn the machine on / allow electricity to flow through the circuit (1).            Button switch (1).</p> <p>Resistor (1), to control the flow of current to other components/to limit the current (1).</p>	4
1. (g) (i)	<p>One mark for each correct answer.</p> <p>Changes could include:</p> <p style="padding-left: 40px;">An increase in the size of the removable water tank.            More colour options for the product.            A completely different design.            Incorporate space for a second cup.            Manufacture it solely from stainless steel.</p> <p>Award one mark for an appropriate benefit.</p>	4 x 1

Question	Answer	Marks
1. (g) (ii)	<p>One mark for each correct answer.</p> <p>Must be manufactured from an insulating polymer.            Must have room inside for a standard fuse.            Must be easy to open and secure, to re-wire, or replace the fuse.            The three pins must adhere to BS 1363-1 (one vertical, larger earth pin, with two smaller horizontal pins below).            Positive, negative and earth pins.            The sides must be shaped, to improve grip when removing the plug from the wall socket.            The flexible cord must be positioned at the bottom of the plug.</p> <p>Accept any reasonable answer that is appropriate.</p>	4
1. (g) (iii)	<p>One mark for each correct answer.</p> <p>Urea formaldehyde - Allows for complicated parts to be injection moulded.            Good electrical insulator.            It has a high tensile strength.            High surface hardness.            Mass production.</p>	2 x 1

Question	Answer	Marks
2. (a)	<p>Accept any validated reason that answers the question.  Note: There must be two different ways and answers must be related to the home environment.</p> <p>Allows the user to do something else while the vacuum is working (work/shopping).  No more cables to trip over.  Device can go under a sofa without the need to lift/move it.  Easier to store / doesn't take as much space when not in use.  Not limited by the length of the cable.</p>	4
2. (b)	<p>Accept any validated reason that answers the question.  Note: The answers must be <b>disadvantages</b>.</p> <p>Cannot vacuum up the stairs.  Cannot vacuum into corners.  Maximum storage capacity not as big as the old bag.  Can take a long time to charge, in return for a short time use. Short charge.  User's responsibility to charge it on a regular basis.</p>	4
2. (c)	<p>Accept any validated reason that answers the question.  Note: The answers must be <b>advantages</b> that relate to <b>the manufacturer</b>.</p> <p>Parts can be manufactured quicker. i.e. injection moulding.  The product can be manufactured in a range of colours – could lead to more sales.  The product can be assembled solely by robots.  Gives the company a modern look.</p>	4
2. (d)	<p>Accept two discussion points or four justified relevant points.</p> <p>Manufactured from durable materials, so won't break easily therefore extending its life.  Customers like the idea that they are helping the environment, which could improve sales.  Manufactured from fewer parts, so less to recycle / reuse.  Parts could be re-used to make the next model.  Manufactured from recycled or recyclable parts.  Li-ion batteries still have most of their charge after years of use.</p>	2 x 2

Question	Answer	Marks
3. (a) (i)	<p>To ensure that the chuck key doesn't stay in the chuck. To avoid injury to the user.</p> <p>Accept any appropriate answer.</p>	2
3. (a) (ii)	<p>Accept any three reasonable answers related to the safe working on the centre lathe.</p> <p>Answers could include:  Appropriate risk assessment completed by the pupil.  Safety goggles/apron to be worn.  Long hair to be tied back.  Limit to the number of persons around the machine.  Work to be securely closed in the chuck.  Machine guard to be in the correct position.  Tools sharpened/set up correctly.  Correct machine speed.</p> <p>Accept any appropriate answer.</p>	3 x 1
3. (b)	<p>Area of circle ( or 2 x half circles)</p> $= 3.14 \times 100^2 = 314 \text{ mm}^2$ <p style="text-align: right;">1 mark</p> <p><math>a = h \times w</math></p> <p>Area of rectangle = <math>40\text{mm} \times 20\text{mm} = 800\text{mm}^2</math> <span style="float: right;">1 mark</span></p> <p><math>800\text{mm}^2 + 314\text{mm}^2 = 1114\text{mm}^2</math> <span style="float: right;">1 mark</span></p> <p>Volume = total x thickness</p> <p><math>1114\text{mm}^2 \times 3\text{mm} = 3342\text{mm}^3</math> <span style="float: right;">2 mark</span></p> <p>Answer must be in mm cubed for the full two marks.</p>	5
3. (c) (i)	<p>To achieve the full 6 marks, both the side and plan views / projections need to be completed.</p> <p>Side view - 4 holes to be drawn on the back (in line with side view).  - 2 vertical holes (hidden detail).</p> <p>Plan view - Full plan view to be drawn, in line with the front view.  - Should include 2 horizontal holes (hidden detail),  4 holes in line with the front view.</p>	6  (2 for the side view) (4 for the top view)
3. (c) (ii)	 <p>1 mark for each image drawn correctly- they must be in the correct order.</p>	2

Question	Answer	Marks
3. (c) (iii)	Accept any appropriate answer not listed below 1 mark for each:  Examples:  Company name Title of drawing Materials named Scale Drawing number/project number/job number Date Personal ID(name)	2