



National
Qualifications
2018

2018 Practical Metalworking

National 5

Finalised Marking Instructions

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General marking principles for National 5 Practical Metalworking

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 detailed marking instructions, which identify the key features required in candidate responses.

- (a) Marks for each candidate response must **always** be assigned in line with these general marking principles and the detailed marking instructions for this assessment.
- (b) Marking should always be positive. This means that, for each candidate response, marks are accumulated for the demonstration of relevant skills, knowledge and understanding: they are not deducted from a maximum on the basis of errors or omissions.

Question		Expected answers	Max mark	Additional guidance
1.	(a)	Ferrous metals contain iron	1	
	(b)	Accept any one of the following: <ul style="list-style-type: none"> tough/hard-wearing/durable impact resistant/won't dent hard can be hardened can be tempered strong/strength any correct property that directly relates to screwdriver use. 	1	Do not accept: <ul style="list-style-type: none"> brittle inferior resistance to corrosion.
	(c)	(i) Round bar	1	
		(ii) Hexagonal bar	1	Accept: any reference to hexagonal bar ie hex/hexagon bar
	(d)	(i) Heat metal (screwdriver blade) (1 mark) to red hot/cherry red (1mark), then cool rapidly (1 mark)	3	Cooling rapidly - candidates may specifically answer cool in water/oil; quench in water/oil. This is acceptable.
		(ii) Accept any one of the following: <ul style="list-style-type: none"> Reduces brittleness. Reduces hardness. 	1	
	(e)	(i) Jacobs chuck key	1	Accept: chuck key
		(ii) V-block	1	

Question		Expected answers	Max mark	Additional guidance
1.	(f)	Centre lathe	1	Do not accept: <ul style="list-style-type: none"> • Metalwork(ing) Lathe. • Metal Lathe. • Lathe.
	(g)	Accept any three of the following: <ul style="list-style-type: none"> • The guard must be placed in position (at all times). • The material to be machined, must be placed in the chuck securely. • The chuck key must not be left in the chuck. • Check emergency stop, foot or knee switches and make sure they are working. • Ensure feed mechanisms are not engaged before starting machine. • Tool is set at correct angle. • Machine should be set at correct speed. • Cutting tool is secure (in tool post). • Drill bit is secure (in Jacob's chuck/tailstock). • Any reference to checking parts of machine for damage/missing. 	3	
	(h)	(i) Handle A	1	
		(ii) Handle B	1	
		(iii) Handle C	1	

Question		Expected answers	Max mark	Additional guidance	
1.	(i)	Accept any one of the following: <ul style="list-style-type: none"> • All 3 jaws move at same time. • The 3 jaw chuck is self-centring. 	1		
	(j)	Accept any one of the following: <ul style="list-style-type: none"> • Set the centre lathe to a slow turning speed. • Use coolant on the knurling tool. • Adjust pressure to knurling tool. • Tool must be at right angle to workpiece. • Clean knurling tool. • Check knurling tool is sharp. • Set pivot pin of knurling tool to centre height. 	2		
	(k)	(i)	9·8	1	
		(ii)	22·32	1	

Question			Expected answers	Max mark	Additional guidance
2.	(a)	(i)	<p><u>Method 1</u> Set oddleg callipers (1 mark) and mark centre lines 10mm from each edge (1 mark) Centre punch where lines intersect (x4) (1 mark) Set spring dividers (1 mark) to 10mm and mark radii (1 mark)</p> <p><u>Method 2</u> Use steel rule and measure 10mm from each edge (1 mark) Use engineer's square and scribe to mark lines (1 mark) Centre punch where lines intersect (x4) (1 mark) Set spring dividers (1 mark) to 10mm and mark radii (1 mark)</p>	5	
		(ii)	To allow the head of a countersunk screw to sit flush with or below the surface of the back plate/material.	1	

Question			Expected answers	Max mark	Additional guidance
2.	(b)	(i)	<p><u>Method 1</u> Any reference to drilling hole(s) to accommodate blade (1 mark) Use hacksaw/junior hacksaw to cut/remove waste material (1 mark) File to lines/correct size (1 mark)</p> <p><u>Method 2</u> Chain drill along waste material (1 mark) Remove waste material with cold chisel or combination of hacksaw and cold chisel (1 mark) File to lines/correct size (1 mark)</p>	3	
		(ii)	<p><u>Ferrule</u> Prevents the handle (wood) from splitting</p> <p><u>Tang</u> To locate/attach the file handle to the file securely</p> <p><u>Safe edge</u> Accept any one of the following:</p> <ul style="list-style-type: none"> • Prevents material from being cut during filing operations. • Protects thumbs/fingers during filing operations. 	3	

Question			Expected answers	Max mark	Additional guidance																														
2.	(c)	(i)	Pop (rivet)	1																															
		(ii)	Snap head (rivet)	1																															
		(iii)	Countersink (rivet)	1																															
	(d)	(i)	Rivet set/snap	1																															
		(ii)	To trim the end of rivet to required length	1																															
	(e)		<table border="1"> <thead> <tr> <th>Part</th> <th>Number</th> <th>Material</th> <th>Length</th> <th>Breadth</th> <th>Thickness</th> </tr> </thead> <tbody> <tr> <td>Back Plate</td> <td>1</td> <td>Mild Steel</td> <td>100</td> <td>60 (i)</td> <td>3</td> </tr> <tr> <td>Grip</td> <td>1</td> <td>Mild Steel</td> <td>70 (ii)</td> <td>30</td> <td>6</td> </tr> <tr> <td>Support</td> <td>2 (iii)</td> <td>Mild Steel</td> <td>26</td> <td>10</td> <td>2</td> </tr> <tr> <td>Knocker Plate</td> <td>1</td> <td>Mild Steel</td> <td>15</td> <td>10 (iv)</td> <td>3-5</td> </tr> </tbody> </table>	Part	Number	Material	Length	Breadth	Thickness	Back Plate	1	Mild Steel	100	60 (i)	3	Grip	1	Mild Steel	70 (ii)	30	6	Support	2 (iii)	Mild Steel	26	10	2	Knocker Plate	1	Mild Steel	15	10 (iv)	3-5	4	
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	(f)		Machine vice	1																															
	(g)		Pedestal or pillar drill	1																															
	(h)		<p>Accept any one of the following:</p> <ul style="list-style-type: none"> To prevent any accidents or injuries. To prevent slips and falls. To access emergency foot stop. 	1																															

Question			Expected answers	Max mark	Additional guidance
3.	(a)	(i)	Any two of the following: <ul style="list-style-type: none"> recycled metals can be used for upcycling saves finite resources/stops metal ore running out less damage to the environment by mining landfill sites will not fill up as quickly so fewer landfills needed. 	2	One mark for each unique point (eg cannot be two points about mining). If the answer is a general comment regarding the environment only 1 mark can be awarded.
		(ii)	Test which metal is magnetic	1	
	(b)		Accept any one of the following: <ul style="list-style-type: none"> Tin snips Hacksaw Junior hacksaw 	1	
	(c)		<ul style="list-style-type: none"> Align the fold line in engineer's vice/folding bars/jig/straight edge/box folder/other appropriate. (1 mark) Form Bend A with hide mallet/rubber/mallet/box folder/folding machine/other appropriate. (1 mark) 	2	
	(d)		Accept any one of the following: <ul style="list-style-type: none"> Easier to locate hole or drill when material is flat. Less chance of drill slipping. Material will deform. Bend if drilled after shaped. Easier to hold material when flat. 	1	

Question		Expected answers	Max mark	Additional guidance
3.	(e)	Accept any one of the following: <ul style="list-style-type: none"> • Use a jig. • Use a former. • Use a template. 	1	
	(f)	Accept any one of the following: <ul style="list-style-type: none"> • Wear gloves. • Wear safety goggles. • Remove sharp edges. 	1	
	(g)	Notcher	1	Accept: guillotine
	(h)	Accept any two of the following: <ul style="list-style-type: none"> • De-burr edges. • File edges smooth. • Use emery cloth - rough/medium/fine grades (only 1 mark if smooth/rough). • Use wet and dry paper. • De-grease. • Primer coat/under coat (if painting/spray painting). • Steel wool. 	2	

Question		Expected answers	Max mark	Additional guidance
3.	(i)	Accept any one of the following: <ul style="list-style-type: none"> • paint • dip coating/plastic • lacquer • polish • bluing • any other appropriate finish. 	1	
	(j)	Accept any one of the following: <ul style="list-style-type: none"> • The tool doesn't function as intended. • Extra force needed which may result in injury. • The tool could slip which may result in injury. 	1	

[END OF MARKING INSTRUCTIONS]