



National
Qualifications
2019

2019 Practical Metalworking

National 5

Finalised Marking Instructions

© Scottish Qualifications Authority 2019

These marking instructions have been prepared by examination teams for use by SQA appointed markers when marking external course assessments.

The information in this document may be reproduced in support of SQA qualifications only on a non-commercial basis. If it is reproduced, SQA must be clearly acknowledged as the source. If it is to be reproduced for any other purpose, written permission must be obtained from permissions@sqa.org.uk.



General marking principles for Practical Metalworking N5

Always apply these general principles. Use them in conjunction with the detailed marking instructions, which identify the key features required in candidates' responses.

- (a) Always use positive marking. This means candidates accumulate marks for the demonstration of relevant skills, knowledge and understanding; marks are not deducted for errors or omissions.
- (b) If a candidate response does not seem to be covered by either the principles or detailed marking instructions, and you are uncertain how to assess it, you must seek guidance from your team leader.

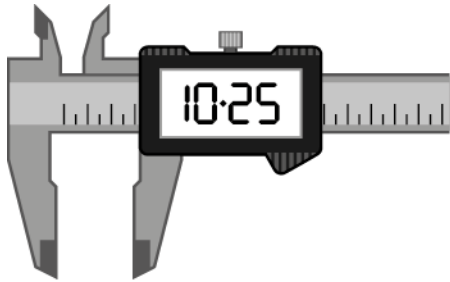
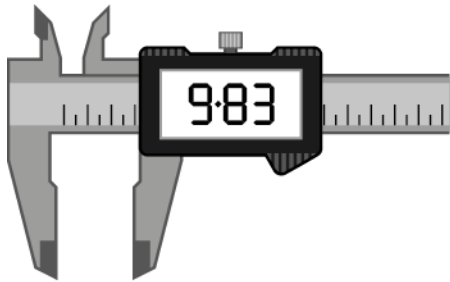
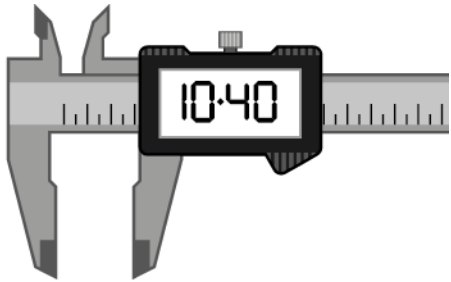
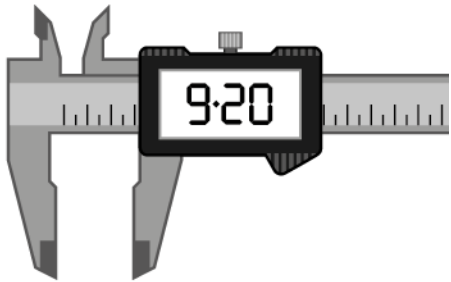
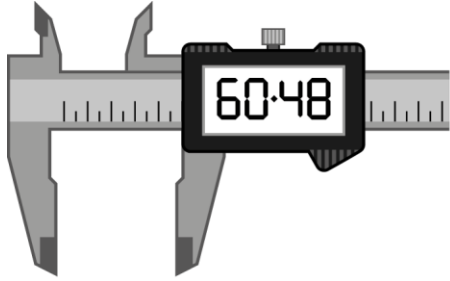
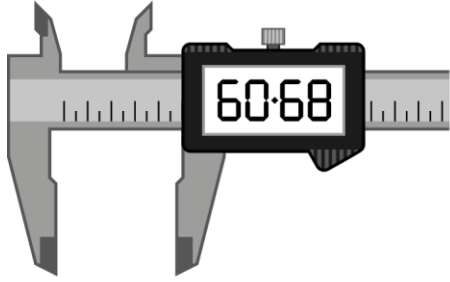
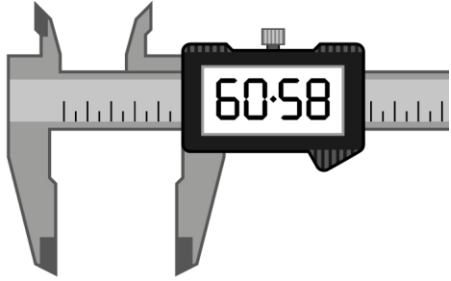
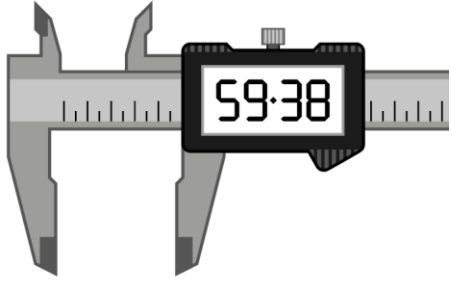
Marking instructions for each question

Question		Expected response	Max mark	Additional guidance
1.	(a)	An alloy is a mixture of 2 or more metals.	1	Accept the definition for brass, ie brass is a mixture of copper and zinc.
	(b)	Accept any one of the following: <ul style="list-style-type: none"> • resistant to corrosion • fairly hard • durable • malleable • easy to solder • polishes to a good finish • easy to machine • very ductile • antimicrobial properties 	1	Do not accept; Non-ferrous
	(c)	An explanation and/or sketch that includes the following: There is too much space between the templates meaning a lot of wasted material.	1	
	(d)	A description, referring to tools/ processes, that covers any three of the following: <ul style="list-style-type: none"> • holding/alignment of material ie g-clamp/machine vice/hand vice (1 mark) • reference to securing (twist) drill in machine (Jacobs chuck) and drill (clearance) hole (1 mark) • use of countersink drill or larger drill bit to suit countersink screw head (1 mark) • drill to the required countersink depth (set depth of pillar drill OR make reference to how screw will sit in hole) (1 mark) 	3	

Question			Expected response	Max mark	Additional guidance
2.	(a)	(i)	<p>'M5' means the (thread) is Metric 5mm OR use a 5mm Tap (1 mark)</p> <p>'12' means the (thread) is 12mm deep (1 mark)</p>	2	
		(ii)	32mm	1	
	(b)		Taper turning	1	<p>Accept; Taper</p> <p>Do not accept; Chamfer</p>
	(c)		<p>Any two of the following:</p> <ul style="list-style-type: none"> • use of eye protection • use of ear protection • wear an apron • tie long hair back • remove jewellery • no loose clothing • any other appropriate answer 	2	Do not accept responses based on machine health and safety
	(d)	(i)	<p>An explanation that includes any of the following:</p> <ul style="list-style-type: none"> • so that the workpiece is as rigid as possible • Pupil A's work is more rigid than Pupil B's. 	1	
		(ii)	Tool post	1	
	(e)		<p>Any two of the following:</p> <ul style="list-style-type: none"> • does not rust/corrosion resistant • requires no finish • lightweight • good strength to weight ratio • easy to turn (on a centre lathe)/easily machined • durable 	2	<p>Accept;</p> <ul style="list-style-type: none"> • light <p>Do not accept;</p> <ul style="list-style-type: none"> • conducts heat and electricity well • aesthetic properties • any reference to aluminium being a non-ferrous metal
	(f)		<p>An explanation that includes the following:</p> <ul style="list-style-type: none"> • the workpiece/grip is already centred on the centre lathe meaning that the position of the hole can be drilled more accurately 	1	

Question		Expected response	Max mark	Additional guidance	
2.	(g)	<p>An explanation that includes any of the following:</p> <ul style="list-style-type: none"> to ensure the thread goes to the base of the hole the plug tap has a full size, untapered thread to the end (ensuring the thread is the full depth of the hole) 	1		
	(h)	<p>A description that includes any two of the following:</p> <ul style="list-style-type: none"> adjust the compound slide to required angle (1 mark) use compound slide feed handle to cut the chamfer (1 mark) <p>OR</p> <ul style="list-style-type: none"> adjust tool/toolpost to required angle/Fit 45° chamfer tool (1 mark) cut chamfer with cross slide/compound slide/saddle (1 mark) 	2		
	(i)	<p>Any one of the following:</p> <ul style="list-style-type: none"> cutting off a piece of metal while on centre lathe. creating a groove/on workpiece 	1	Accept; Parting off	
	(j)	<p>Heat metal (to correct temperature) (1mark),</p> <p>then cool slowly (ie in sand) (1 mark)</p>	2		
	(k)	(i)	Die Stock	1	Do not accept; Die Holder
		(ii)	<p>Any one of the following:</p> <ul style="list-style-type: none"> split die die 	1	

Question		Expected response	Max mark	Additional guidance
3.	(a)	Any one of the following: <ul style="list-style-type: none"> to accurately locate the drill bit. to ensure it does not drift from the correct location. 	1	
	(b)	Hacksaw	1	Accept; <ul style="list-style-type: none"> junior hacksaw chain drill and cold chisel Do not accept; Chisel
	(c) (i)	Jacobs chuck	1	Accept; <ul style="list-style-type: none"> keyed chuck drill chuck Do not accept; chuck
	(ii)	To hold the drill bit (securely and centrally)	1	
	(d)	3mm twist drill	1	
	(e)	Any one of the following: <ul style="list-style-type: none"> don't use fingers wear gloves wear eye protection use a brush ensure machine is switched off 	1	Do not accept; emery cloth
	(f) (i)	Any one of the following: <ul style="list-style-type: none"> to prevent the metal from dulling/staining/tarnishing/rusting aesthetic/decorative reasons 	1	
	(ii)	Any one of the following: <ul style="list-style-type: none"> can be sprayed on from can can be applied with brush 	1	

Question			Expected response	Max mark	Additional guidance
3.	(g)	(i)	 <input type="checkbox"/>  <input checked="" type="checkbox"/>	1	 <input type="checkbox"/>  <input type="checkbox"/>
		(ii)	 <input checked="" type="checkbox"/>  <input type="checkbox"/>	1	 <input type="checkbox"/>  <input type="checkbox"/>

Question			Expected response	Max mark	Additional guidance
4.	(a)	(i)	<p>Any one of the following:</p> <ul style="list-style-type: none"> the recycling centre does not have to separate the parts all parts can be recycled together 	1	
		(ii)	<p>A statement that includes any one of the following:</p> <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 through mining landfill sites will not fill up as quickly so fewer landfills needed recycling metal takes less energy than producing metal from raw materials (ore). Energy efficiency reduces greenhouse gas emissions reduces pollution from transportation. 	1	
	(b)		<p>Method 1 Set oddleg callipers (1 mark)</p> <p>and mark centre lines 15mm from each edge (1 mark)</p> <p>Centre punch where lines intersect (x2) (1 mark)</p> <p>Set spring dividers (1 mark)</p> <p>to 15mm and mark radii (1 mark)</p> <p>OR</p> <p>Method 2 Use steel rule and measure 15mm from each edge (1 mark)</p> <p>Use engineer's square and scribe to mark lines (1 mark)</p> <p>Centre punch where lines intersect (x2) (1 mark)</p> <p>Set spring dividers (1 mark)</p> <p>to 15mm and mark radii (1 mark)</p>	5	Candidate only needs to reference one instance of marking out R15 on blade.
	(c)		Witness Marks	1	

Question		Expected response	Max mark	Additional guidance	
4.	(d)	<p>Any two of the following:</p> <ul style="list-style-type: none"> the guard must be placed in position (at all times) the chuck key must not be left in the jacobs chuck check emergency stop, foot switches and make sure they are working machine should be set at correct speed drill bit is secure (in jacobs chuck) any reference to checking parts of machine for damage/missing parts 	2		
	(e)	<p>Any one of the following:</p> <ul style="list-style-type: none"> remove burr with larger drill bit remove burr countersink/rose tool remove burr with centre drill remove burr with deburring tool remove burr with round file 	1	<p>Do not accept;</p> <ul style="list-style-type: none"> use a file use emery cloth 	
4.	(f)	<p>Remove dirt/grease from joint/clean joint (1 mark)</p> <p>Apply flux to the joint/brazing rod (1 Mark)</p> <p>Heat the metal (to correct temperature) (1 mark)</p> <p>Apply the tip of brazing rod to the joint (allowing the rod to melt and fill the joint) (1 mark)</p>	4	Candidates can be awarded 1 mark for use of brazing rod with no additional description	
	(g)	<p>Heat metal (to correct temperature) (1 mark)</p> <p>Quench into used engine oil/graphite powder/or suitable alternative (to allow the carbon to coat the outside) (1 mark)</p>	2		
	(h)	(i)	Snap head rivet	1	Do not accept; Snap
		(ii)	<p>2 Use rivet set to bring metal together (1 mark)</p> <p>5 Form head with snap (1mark)</p>	2	

