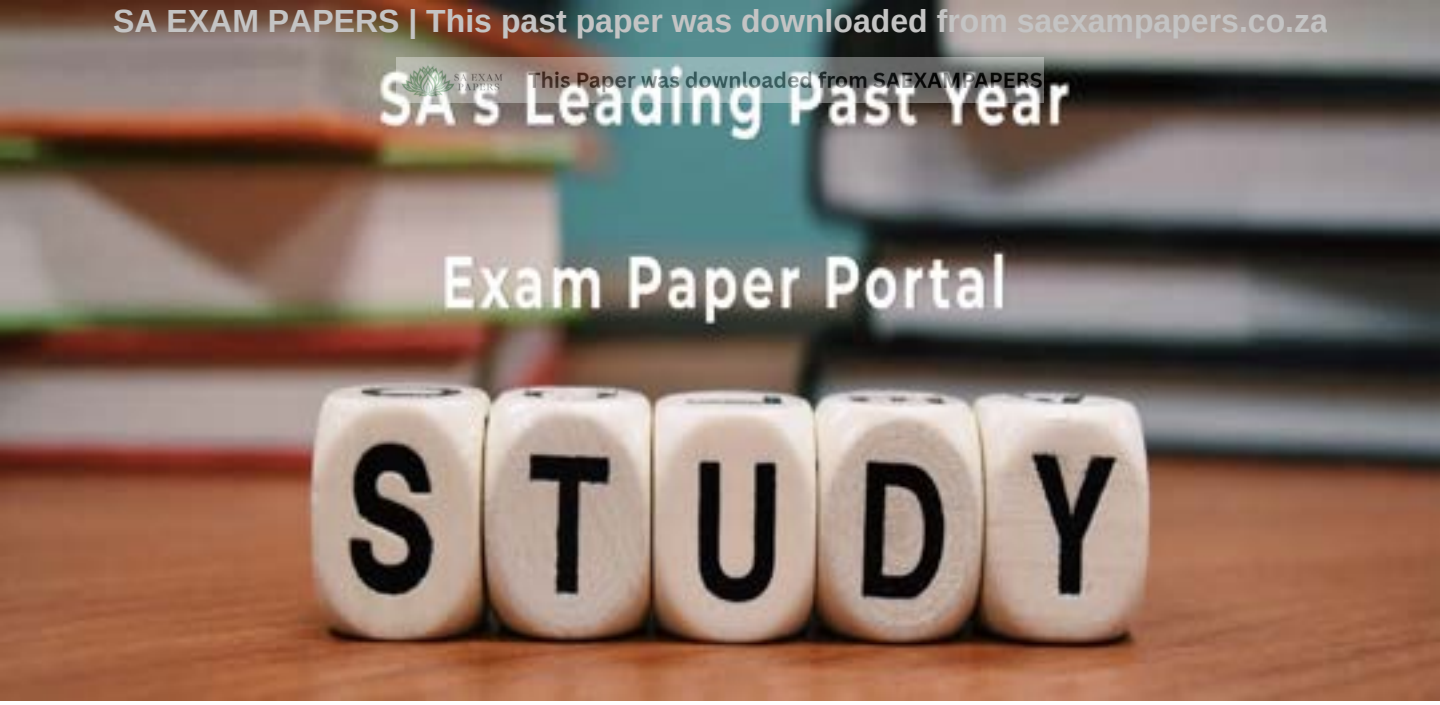


GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

JUNE EXAMINATION 2025

GRADE 12

MARKING GUIDELINES

CIVIL TECHNOLOGY: CIVIL SERVICES

16 pages

INSTRUCTIONS FOR THE MARKERS

1. Markers should:

- Familiarise themselves with the question and answer before evaluating the responses of candidates.
- Always interpret the responses of the candidates within the context of the question.
- Consider any relevant and acceptable answer during pre-marking but should strictly adhere to the answers after finalisation of the marking guidelines.
- There are TWO approaches to answering questions; these are (1) to describe and (2) to explain.
- If a candidate is required to explain, e.g. a process in 4 steps, only the first 4 responses should be considered.
- If however a candidate is required to e.g. explain or describe how to transfer heights from one point to another using a transparent pipe level we need to consider that candidates may write a long description, not necessarily well organised, as an intellectual response may do. In this case the marker needs to evaluate the complete statement to judge if the candidate explained the required outcome satisfactorily and allocate marks on merit. The marker should apply his/her professional judgement with these types of questions.
- Mark what the candidate wrote and do not award marks for answers that the marker thinks the candidate meant with what was written.
- Indicate the tick or cross right at the position where the mark needs to be awarded or where the candidate made the error.
- Accept the letter corresponding with the correct answer as well as the answer written in full in multiple-choice questions.
- Accept incorrect spelling in one-word answers unless the spelling changes the meaning of the answer.

2. For calculations:

- A mark is only awarded if the correct unit is written next to the answer.
- If TWO marks are awarded ONE mark is awarded for the answer and ONE mark for the correct unit.
- Where the candidate made a principle error, e.g. added instead of multiplying, no marks will be awarded for the steps. If the answer is correct according to what the candidate did, the mark for the answer can be awarded for the application of skills.
- Where an incorrect answer could be carried over to the next step, the first answer will be deemed incorrect. However, should the incorrect answer be carried over correctly, the marker has to recalculate the values, using the incorrect answer from the first calculation. If correctly used, the candidate should receive the full marks for subsequent calculations.
- Markers should consider when and where a candidate has rounded off in a calculation, as well as the subsequent effect it has on the final answer obtained. The calculation should therefore be awarded marks on merit.
- Alternative methods of calculations must be considered, provided that the correct answer is obtained.

3. When marking drawings:

- The member for which the mark should be awarded should be drawn correctly in the correct position to receive a mark.
- A member incorrectly drawn but wrongfully repeated in another position will be awarded the mark for the repeated incorrect member provided that the marking guidelines provide for TWO or more marks for that member (positive marking).
- Marks can only be awarded for a label if the label is correctly indicating the correct member.
- Scale drawings should always be marked using an appropriate mask.

When a candidate drew the wrong drawing, e.g.:

- A horizontal section instead of a vertical section, no marks will be allocated to the drawing as the candidate did not respond to the expected outcome.
- An orthographic view instead of sectional view, no marks will be allocated to the drawing as the candidate did not respond to the expected outcome.
- An orthographic view instead of an isometric view, no marks will be allocated to the drawing as the candidate did not respond to the expected outcome.
- If the incorrect drawing was drawn, the candidate can be awarded for only what was asked but mark/s for the correctness of the drawing will not be awarded.

QUESTION 1: QUESTION 1: OHS, SAFETY, MATERIALS, TOOLS, EQUIPMENT AND JOINING (GENERIC)

1.1	1.1.1	G ✓		(1)
	1.1.2	F ✓		(1)
	1.1.3	B ✓		(1)
	1.1.4	H ✓		(1)
	1.1.5	K ✓		(1)
	1.1.6	N ✓		(1)
	1.1.7	M ✓		(1)
	1.1.8	E ✓	not part of services. Award mark to leaner	(1)
	1.1.9	C ✓	not part of services. Award mark to leaner	(1)
	1.1.10	J ✓	not part of services. Award mark to leaner	(1)
1.2	1.2.1	B ✓		(1)
	1.2.2	B ✓		(1)
	1.2.3	C ✓		
	1.2.4	C ✓		(1)
	1.2.5	D ✓		(1)

1.3 1.3.1
- The telescope ✓ **or** dumpy level. ✓

(1)

1.3.2
- Determining differences between levels and vertical heights, especially over longer distances ✓
- Determining levels and slopes
- Setting out buildings
- Transferring levels and heights

ANY ONE OF THE ABOVE (1)

1.4
- Every plank of a scaffold platform is firmly secured to prevent its displacement. ✓
- Every platform is constructed to prevent materials and tools from falling through.

ANY ONE OF THE ABOVE (1)

1.5 1.5.1
- It prevents workers from falling off the scaffold. ✓✓
- To prevent materials from falling off the scaffold.
- It can be used as a handrail.
- It is used to strap safety harnesses onto it.

ANY ONE OF THE ABOVE (1)

1.5.2
- To prevent materials from falling off the scaffold. ✓
- To prevent tools from falling off the scaffold.

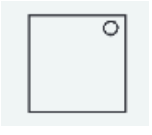
ANY ONE OF THE ABOVE

(1)

[20]

QUESTION 2: GRAPHICS AS MEANS OF COMMUNICATION (GENERIC)

NO.	QUESTIONS	ANSWERS	MARKS
2.1	Name the drawing depicted in FIGURE **B.**	Ground floor plan ✓	1
2.2	Deduce the scale of the drawing.	1:100 ✓	1
2.3	Identify number **4**.	Finished floor level/FFL ✓	1
2.4	Identify number **12**.	Earth ✓	1
2.5	Identify number **11**.	Bath/B ✓	1
2.6	Identify number **8**.	Sliding Door/Door ✓	1
2.7	Identify number **7**.	Rainwater down pipe/RWDP ✓	1
2.8	Identify number **14**.	Distribution board/ DB ✓	1
2.9	Identify number **5**.	Window sill/Sill ✓	1
2.10	Identify the number that indicates the WATT METER in **FIGURE B**.	Number 13/ 13 ✓	1
2.11	Recommend TWO suitable scales for floor plans other than the one listed in the notes.	1:50 ✓ 1:200 ✓	2
2.12	Give the abbreviations for the following: 2.12.1 Water closet 2.12.2 Bath	2.12.1 WC ✓ 2.12.2 B ✓	2

2.13	Name the feature that must be placed in front of the sliding door as specified in the notes.	Ramp ✓	1
2.14.	Who checked the drawing?	P. BRITZ ✓	1
2.15	Describe what is indicated by number **3**?	Window frame/Casement//Double casement ✓	1
2.16	Differentiate between the light installed in the lounge and in the office	Light in the lounge is a fluorescent light ✓ Light in the office is a ceiling light ✓	2
2.17	Deduce the drawing number from the building plan.	557P9 ✓	1
2.18	Who must be notified when a contractor sets out levels on a site and there are variances?	Architect/JP MALOI ✓	1
2.19	Identify ONE important feature that is omitted on the plan.	Electrical wiring ✓	1
2.20	What should be installed for balancing and support as you go up the staircase?	Handrail ✓	1
2.21	Deduce the height of window 2 from the window schedule.	1 200 mm/1,2 m ✓	1
2.22	Draw the symbol for a shower.	 ✓	2

2.23	Draw the electrical symbol for a wall mounted light.	 ✓	1
2.24	Deduce the width of window 3 from the window schedule.	2 000 mm/2 m ✓	1
2.25	Recommend a suitable floor covering for the bathroom	Tiles/Vinyl/Concrete/Wooden/ Porcelain/Ceramic/Cork flooring ✓	1
2.26	Explain what is meant by 1:10 indicated on the symbol in the notes	For every 10 metres going across, the ramp goes up by one metre/ Slope of the ramp ✓	1
2.27	Identify the type of roof that is used for the building on FIGURE **A**.	Gable roof ✓ **not part of services. Award mark to leaner**	1
2.28	Prove, by means of a control test, that the total vertical dimensions on the left and right of the plan in FIGURE **B** are equal.	Total vertical measurements: Control test left / Control test right 220 / 220 ✓ 2 000 / 2 000 ✓ 110 / 110 ✓ 4 000 / 4 000 ✓ 220 / 220 ✓ 6 550 = 6 550 ✓ **OR** Left side: 220 ✓ + 2 000 ✓ + 110 ✓ + 4 000 ✓ + 220 ✓ = 6 550 mm ✓ Right side: 220 + 2 000 + 110 + 4 000 + 220 = 6 550 mm ✓ Notes: In case an alternative method was used one mark must be given if both totals are the same.	6
2.29	Calculate the area of the bathroom. Show ALL calculations. Give your answer in m². Round off your answer to TWO decimal places.	= 3 000 mm x 2 000 mm = 3 m ✓ x 2 m ✓ = 6 m^2 ✓	3
		TOTAL:	**40**

QUESTION 3: CONSTRUCTION ASSOCIATED WITH CIVIL SERVICES, OHSA AND QUANTITIES (SPECIFIC)

3.1 3.1.1 76 mm x 50 mm ✓ (1)

3.1.2 Water-logged ground ✓ (1)

3.1.3 1:90 ✓ (1)

3.1.4 Spirit level ✓ (1)

3.1.5 150 mm ✓ (1)

3.2 3.2.1 Shoring ✓ /soil / firm ground / medium ground or lose ground. (1)

3.2.2
- To support the sides of the excavations. ✓
- To ensure that sides do not cave in.

ANY ONE OF THE ABOVE (1)

3.2.3
- Red ✓
- Orange ✓ (2)

3.2.4 Items that should not be placed near the edge of an excavation are:
- Any type of load ✓
- Materials ✓
- Heavy machinery/vehicles
- Equipment

ANY TWO OF THE ABOVE (2)

3.2.5 Soil compaction is a process of increasing the density of soil ✓ by pressing the soil particles closer together. ✓

OR

Reducing the volume of air trapped between the particles using hand compaction or a rammer. (2)

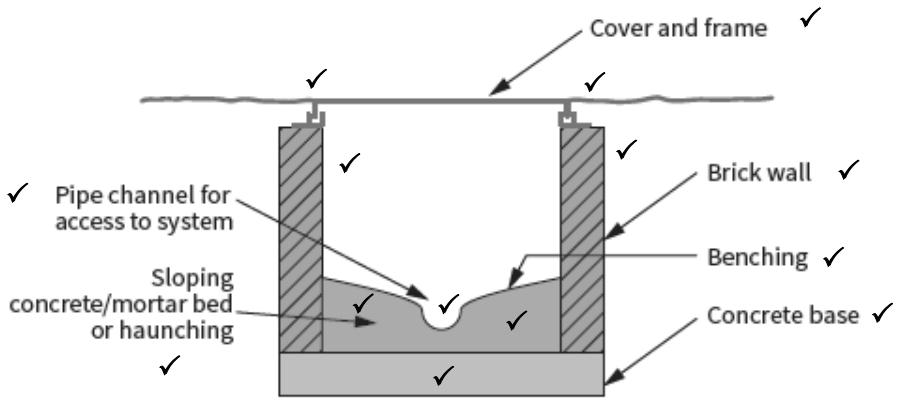
3.3 3.3.1 Volume of a cubic water storage tank:
= Area of base x height
= S^3
= 3 m ✓ x 3 m ✓ x 3 m ✓
= 27✓ m^3 ✓ (5)

3.3.2 Volume of water in tank = 27 x 1 000 ✓ litres/cubic metre
= 27 000 ℓ ✓ (2)

3.4	A	B	C	D	
3.4.1	1/	1,25 ✓ 1,11 ✓ 0,125 ✓	0,173 m^3✓	**Volume of concrete needed for the floor slab:** Length of floor slab = 1 250 mm Width of floor slab = 1 110 mm Thickness of concrete = 125 mm 0,173 m^3 of concrete is needed for the floor slab total marks does not correlate with the question mark total. Memo mark is correct.	(4)
3.4.2	2/	3,24 ✓ 1,1 ✓ 50 ✓	356,4 bricks ✓ or 357 bricks	**Centre line of manhole walls:** 2/660 mm = 1 320 mm 2/520 mm = 1 040 mm Total: = 2 360 mm Plus: 4/220 = 880 mm Total centre line = 3 240 mm **Number of bricks:** Centre line = 3 240 mm Height of wall for manhole = 1 100 mm 50 bricks per m^2 for a $\frac{1}{2}$ brick wall 357 bricks are needed	(4)
3.4.3				**5% for breakage:** = $\frac{5}{100}$ x 357 = 17,85 = 18 bricks ✓ **Total number of bricks needed:** = 358 + 18 = 375 bricks ✓	(2)
					[30]

QUESTION 4: COLD-WATER SUPPLY AND CONSTRUCTION (SPECIFIC)

4.1



Brick built manhole

(14)

No	ASSESSMENT CRITERIA	MARKS
1.	6 Labels	6
2.	Benching.	2
3.	Pipe channel for access to system	1
4.	Walls	2
5.	Foundation	1
6.	Drawing of the cover and frame.	2

4.2 4.2.1 Accessories:

- Steel steps ✓
- Reducer slabs ✓
- Cover slabs ✓
- Concrete lid

ANY THREE OF THE ABOVE. (3)

4.2.2

- As close as possible to the municipal connection, but not further than 2 m from the boundary fence. ✓
- Every 20 to 25 m on straight section of a drain line.
- At all important changes of direction. ✓
- At changes of gradient and level, such as where the ground is terraced. ✓
- At all important junctions.

ANY THREE OF THE ABOVE (3)

4.3 4.3.1 Ball valve ✓ **removed the "S"** (1)

4.3.2 A – Plunger ✓
B - Lever arm ✓
C – Nozzle ✓

D – Body ✓

(4)

4.3.3 the water will rise the lever arm to a point that it touches the plunger that is connected to the nozzle to stop the flow✓ of the water when the cistern is full. ✓ (2)

4.3.4 Inside a cistern ✓ (1)

4.4
- Aerator device ✓
- Pillar mixer tap with one lever ✓
- Sensor tap ✓
- Demand pillar tap/ press the tap to trigger the flow of water ✓ (4)

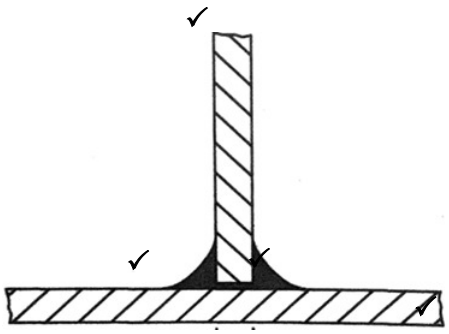
4.5 Refers to water that has been contaminated by human waste ✓ and other pollutants, whether from a commercial, industrial, domestic or agricultural source, that may contain a broad spectrum of chemical and organic matter, some harmless and others lethal. ✓ (2)

4.6 A flange gasket must be inserted between the flanges. ✓ (1)

4.7
- Using different threaded couplings. ✓
- Use Teflon or plumbers tape to secure the joint.
- Flange joint with bolt and nut.

ANY ONE OF THE ABOVE (1)

4.8



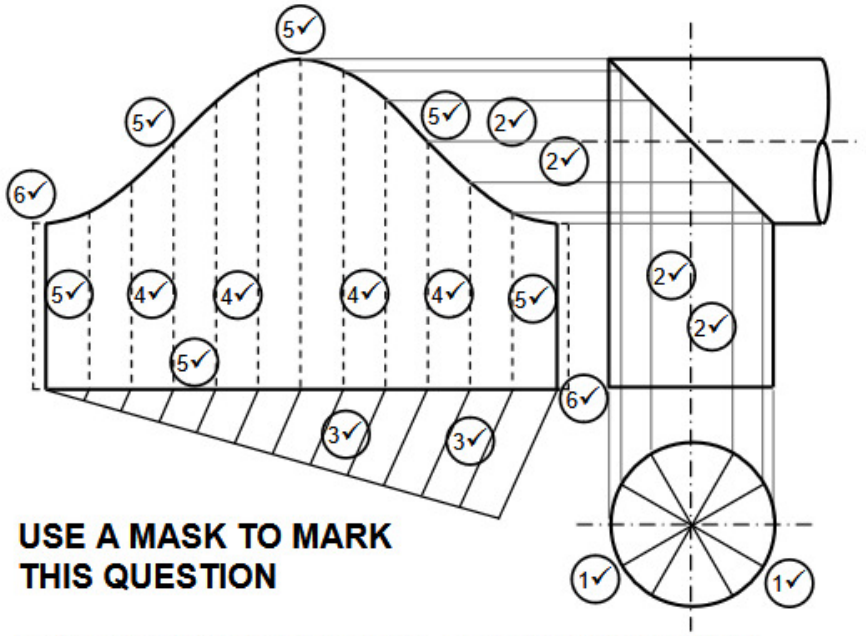
NO	ASSESSMENT CRITERIA	MARK
1	Hatching.	1
2	Solder area.	2
3	Placement of sheet metals jointed	2

(4)

[40]

QUESTION 5: GRAPHICS AS MEANS OF COMMUNICATION AND QUANTITIES SPECIFIC)

5.1



USE A MASK TO MARK THIS QUESTION

Note: Candidates may use any of the following methods to divide the plan view into 12 parts.

- Transfer distance from top view.
- Calculate circumference and divide by 12.
- Construction to divide line into equal parts.

NO.	ASSESSMENT CRITERIA	MARK
1	Dividing circle in 12 parts (top view)	2
2	Projection lines from top and front view	4
3	Dividing development into 12 parts	2
4	Folding lines of development	4
5	Outside lines of developments	6
6	3 mm seam on both sides	2
	TOTAL:	**20**

5.2 5.2.1 Pressure vertical geyser ✓ / high pressure vertical geyser. (1)

5.2.2 1 ✓ (1)

5.2.3 Copper ✓ / Brass (1)

5.2.4 Vacuum-relief valve ✓ (1)

5.2.5 Copper ✓/ Brass (1)

5.2.6 1 ✓ (1)

5.2.7 Copper ✓ / Brass (1)

5.2.8 1 ✓ mark given to leaners (1)

5.2.9 1 ✓ (1)

5.2.10 Pressure-reducing valve ✓ (1)

[30]

QUESTION 6: JOINING, MATERIALS AND TOOLS AND EQUIPMENT (SPECIFIC)

6.1
- Dezincification is used in the preparation of galvanised metals for soldering. ✓
- Dezincification is a form of corrosion that weakens brass objects, as zinc is dissolved and removed from the alloy ✓

(2)

6.2
- Dezincification is the selective leaching of zinc from copper alloys. ✓
- It is an electrochemical reaction between zinc and water. ✓
- In the presence of oxygen and water, zinc gradually dissolves from the surface of an alloy, leaving behind a weak, spongy copper layer. ✓
- It can progress through the part/ fitting, causing leaks.
- It can cause blockages if it forms a deposit.

ANY THREE OF THE ABOVE. (3)

6.3
- In chemistry and manufacturing, electrolytic is a technique that uses a direct electric current ✓
- (DC) to drive an otherwise non-spontaneous chemical reaction. ✓
- It can be seen as the chemical change of one material in which the substance loses or gains an electron (oxidation or reduction) . ✓

(3)

6.4
- Electrically insulate the two metals. ✓
- Ensure there is no contact with an electrolyte. ✓
- Apply an antioxidant paste to copper and aluminium surfaces. ✓
- Choosing metals that have similar electrode potentials.
- Connecting a direct current (DC) supply to oppose the corrosive galvanic current.

ANY THREE OF THE ABOVE (3)

6.5 6.5.1 Pipe-thread cutting machine ✓ (1)

6.5.2
- To thread pipes ✓
- To cut pipes ✓
- To make cute nuts or bolts

ANY TWO OF THE ABOVE. (2)

6.5.3
- Maintain tools with care. ✓
- Keep cutting tools sharp and clean. ✓
- Check for misalignment or binding of moving parts.
- Use only accessories that are recommended by the manufacturer.
- Grease cutting parts for a smooth cut.
- Start the cutting of threads slowly at first, and then move to a steady pace.
- Secure the machine.
- Keep the cover in place.
- Support long heavy pipes.
- Do not wear loose-fitting clothing or gloves.
- Do not use the machine if the foot switch is broken.

ANY TWO OF THE ABOVE (2)

6.5.4
- Check if the machine is not broken. ✓
- Make sure you know how to use this machine. ✓
- Wear the correct PPE, gloves, safety glasses and overalls.
- Check if the machine has all safety covers in place.
- Check if the machine's electrical wires is intact.

ANY TWO OF THE ABOVE (2)

6.5.5
- Safety gloves ✓
- Safety glasses ✓ / safety goggles
- Overalls
- Safety protective non-slip shoes.

ANY TWO OF THE ABOVE (2)

6.6
- Hacksaw ✓
- Pipe cutter ✓

(2)

6.7
- Pipe flange ✓
- Pipe clamp ✓
- Steel hangers
- Perforated straps

ANY TWO OF THE ABOVE (2)

6.8
- Mark the pipe to indicate the correct length. ✓
- Place the pipe in a vice or hold it firmly in one hand. ✓
- Clamp the cutter onto the pipe. ✓
- Make sure the centre of the wheel is on the cutting line. ✓
- Rotate the tool clockwise and anticlockwise to ensure that the wheel cuts into the metal. ✓
- Tighten the cutter a little and turn again until the pipe is cut. ✓

(6)

6.9 6.9.1
- Rivet gun ✓
- Pop rivet gun (1)
-

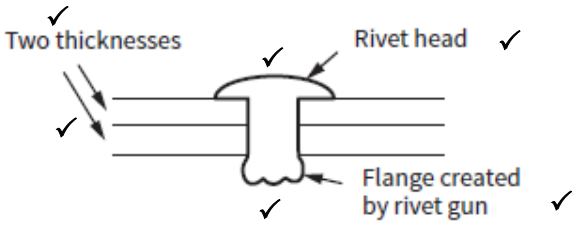
6.9.2
- Steel ✓
- Stainless steel (1)

6.9.3
- Aluminium ✓
- Stainless steel (1)

6.9.4
- Galvanised sheet to steel✓
- Wood to steel
- Two parts of steel.

ANY ONE OF THE ABOVE (1)

6.9.5



NO	ASSESSMENT CRITERIA	MARK
1.	3 Labels.	3
2.	2 metals must show.	1
3.	Head of the pop rivet	1
4.	Flange created by the rivet gun	1

(6)
[40]

TOTAL: 200