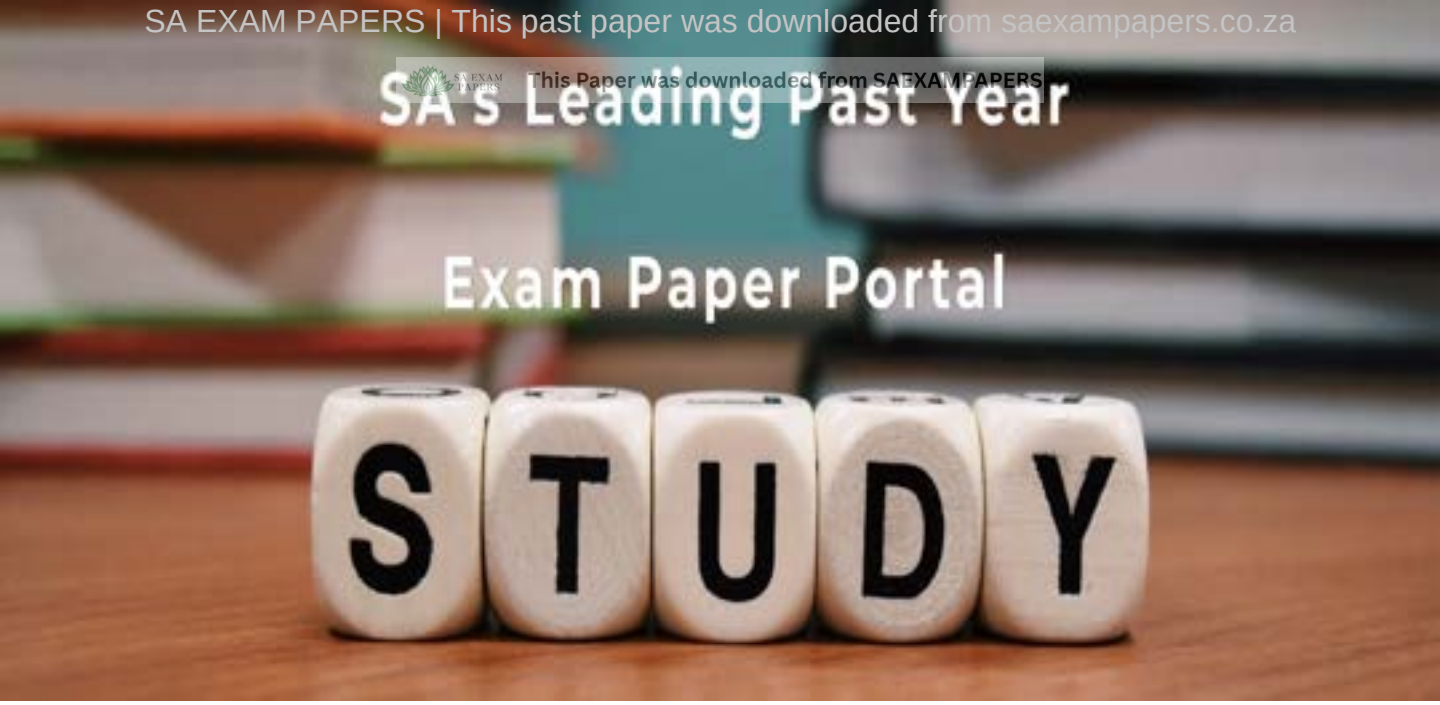


GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

JUNE EXAMINATION
GRADE 12

2026

MARKING GUIDELINES

CIVIL TECHNOLOGY:
CIVIL SERVICES

15 pages

INSTRUCTIONS FOR THE MARKERS

1. Markers should:

- Familiarise themselves with the question and answers 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 adhere strictly 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. to 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 based on what was written.
- Indicate the tick or cross at the position where the mark needs to be awarded or where the candidate made the error.
- Accept the letter corresponding to 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 calculation 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 guideline 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.
- If an orthographic view instead of sectional view is presented, no marks will be allocated to the drawing as the candidate did not respond to the expected outcome.
- If an orthographic view instead of an isometric view is presented, 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 marks only for what was asked but mark/s for the correctness of the drawing will not be awarded.

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

1.1

1.1.1 Oil or water-based paint ✓ (1)

1.1.2 Increase the strength of concrete ✓ (1)

1.1.3 Electrolysis ✓ (1)

1.1.4 Plastic ✓ (1)

1.1.5 Zinc ✓ (1)

1.2

1.2.1 **A** – Guardrail ✓
B – Kickboard OR toe-board ✓
C – Base ✓ (3)

1.2.2 Independent scaffolding ✓ (1)

1.2.3 1 m **OR** 1 000 mm ✓ (1)

1.3

1.3.1 Rawl bolt/Coach screw with a plug/Threaded rod/Bolt and nut/Plastic plug with a screw ✓ (1)

1.3.2
- Are strong fasteners ✓
- Resists pull-out failure ✓
- Have excellent mechanical properties
- Have excellent carrying capacity/ability/carry heavy weight
- Are suitable for tensile strength and yield stress
- Are suitable for variance of hole sizes

ANY TWO OF THE ABOVE (2)

1.3.3
- Drill holes into the pier and remove the debris ✓
- Remove bolts and washers and insert shields into holes. ✓
- Insert bolt with washers through the hinges and tighten. ✓

OR

- Drill holes into the pier and remove the debris
- Insert plastic plugs into the holes
- Insert Rawl bolts/coach screws with plugs/threaded rods/bolts/plastic plugs with screws through the hinges and tighten (3)

1.4

1.4.1 Multi-detector ✓ (1)

1.4.2 Care of the multi detector:

- Place the multi-detector in its holder directly after use. ✓
- Do not bump the instrument against objects or drop it.
- Protect the multi-detector against moisture and direct sunlight.
- If the measuring tool is not used for a long period, remove the battery.
- Wipe away dirt or spots with a dry, soft cloth.
- Switch off the device before storing.

ANY ONE OF THE ABOVE (1)

1.5

- Materials can be moved manually. ✓
- By means of a wheelbarrow/trolley. ✓
- Materials can be moved by means of machinery.
- Builder's hoist.
- Truck.
- Crane.
- Tractor.
- Conveyor.
- Forklift.

ANY TWO OF THE ABOVE (2)

[20]

QUESTION 2: GRAPHICS AS MEANS OF COMMUNICATION (GENERIC)

ANSWER SHEET 2

NO.	QUESTION	ANSWER	MARKS
1.	Identify the elevation in FIGURE **A**.	South Elevation ✓	1
2.	Describe the type of house that is indicated in FIGURE **A**.	Double-storey house/ Building/Multi-storey building ✓	1
3.	Identify number **1**.	Ridge Capping/Ridge tile/Ridge plate/Ridge ✓	1
4.	Identify number **3**.	Fascia board ✓	1
5.	Identify number **4**.	Overhang/Eave/Dimension line ✓	1
6.	Identify the fastener indicated by number **5**.	Holder bat/Clamp/Clip ✓	1
7.	Identify number **6**.	Window/Window frame/Casement/ Casement frame ✓	1
8.	Identify number **7**.	Shoe/Down pipe outlet/ Spout ✓	1

NO.	QUESTION	ANSWER	MARKS
9.	Identify number **8**.	Natural ground level/NGL ✓	1
10.	What does *DPM* stand for, as indicated in the notes?	Damp proof membrane ✓	1
11.	Identify number **10**.	Built-in cupboard/BIC ✓	1
12.	Recommend a suitable material that can be used for the manufacturing of number **2** in FIGURE **A**.	Fibre cement/Galvanised sheeting/Sheet metal/Timber/Wood/Plastic/Fibre glass/Aluminium sheeting ✓	1
13.	Name the TWO elevations on which number **2** is installed.	West elevation ✓ East elevation ✓	2
14.	Describe the purpose of number **3**.	The gutter is fixed against it. ✓ It finishes off the roof. Protects roofs/rafters from rainwater. Appealing look/ aesthetically pleasing.	1
15.	Deduce ONE feature that has been omitted from the elevation in FIGURE **A**.	Sill missing at the window ✓	1
16.	Recommend any TWO sanitary fitments carrying wastewater, other than a bath, that can be installed in the room indicated by number **11**.	Hand basin/Wash hand basin/Hand basin/Basin/WB/WHB/HB ✓ Shower/SH ✓	2
17.	What sanitary fixture carrying soil water can be installed in the room indicated number **12**?	Water closet/WC Bidet/BT/ Urinal ✓	1
18.	Describe the error that appears at number 6 in the elevation in FIGURE **A**.	The two side windows are opening to the wrong sides/No window sill/ The window drawn in FIGURE A is not the same as that in the window schedule/Window opening. ✓	1
19.	State the reference code for this plan.	QP 4 - 2020 ✓	1
20.	Which room will number **13** serve?	Bedroom 2 ✓	1
21.	What does the line between numbers **13** and **14** represent?	Electrical wiring/cable/connection Wiring/Wiring from light switch to light/Shows which switch operates which electrical fitting ✓	1
22.	Differentiate between number **15** in FIGURE **B** and number **17** in the notes.	15: Single tube fluorescent light/ 17: Double/tube fluorescent light. 15: Will use less electricity/Watt than 17 15: Will provide less light than 17	2

NO.	QUESTION	ANSWER	MARKS
		15: Running cost will be cheaper than 17. 15: Has one tube 1 x 40 Watt. 17: Has two tubes 2 x 40 Watt. ✓✓	
23.	Explain the installation of brick force from the top of the window to the wall plate, as indicated by the architect.	Brick force must be installed between every course above the window up to wall plate. ✓	1

24.	Recommend a possible finish for the outside walls of the house.	Face bricks Plaster and paint/Plaster/Paint/Plaster finish (Smooth finish/Splatter finish/Wavy finish/Bagging finish) Cladding/Tiling ✓	1
25.	Deduce from FIGURE **2** which elevations does not have windows.	East elevation ✓	1
26.	Deduce the thickness of the external wall in FIGURE **2**.	220 mm ✓	1
27.	Name the material that can be used to close the open sides of number **16**.	Wood/Timber/Stainless steel/Mild steel/Steel/Aluminium/Glass/ Perspex ✓	1
28.	Name the town in which the proposed dwelling will be built.	Cradock ✓	1
29.	Calculate the area of the bathroom. Show ALL calculations. Give your answer in m².	ℓ x b OR ℓ b = 2 m✓ x 2 m ✓ = 4 m² ✓ OR 2 000 mm x 2 000 mm = 4 m²	3
30.	Calculate the total length of the wall on the eastern side of the building. Show ALL calculations. The length must be indicated in meters.	220 ✓+ 3 000 ✓ + 110 ✓ + 1 400 + 110 + 2 000 ✓+220 ✓ = 7 060 mm = 7,06 m ✓ OR 220 + 3 000 + 110 + 3 510 + 220 = 7 060 mm = 7,06 m	6
		TOTAL:	**40**

QUESTION 3: CONSTRUCTION ASSOCIATED WITH CIVIL SERVICES AND OHSA (SPESIFIC)

3.1

3.1.1 Identifies a danger zone✓
Prevents material or persons falling in

ANY ONE OF THE ABOVE (1)

3.1.2 Provides manhole workers with clean air ✓
Pipe for extractor fan or blower.
Centrifugal pump or Jetting Machine.
ANY ONE OF THE ABOVE (1)

3.1.3 When (1) dangerous fumes/gases are ✓ (2) present in the manhole/ confined spaces. ✓ or fluids. (2)

3.1.4 Respirator ✓ (1)

3.2 Methods of backfilling trenches are:

- Compaction/Fill and compact ✓
- Jetting/Flowable fill ✓ (2)

3.3

3.3.1 Moderately/firm ground ✓ (1)

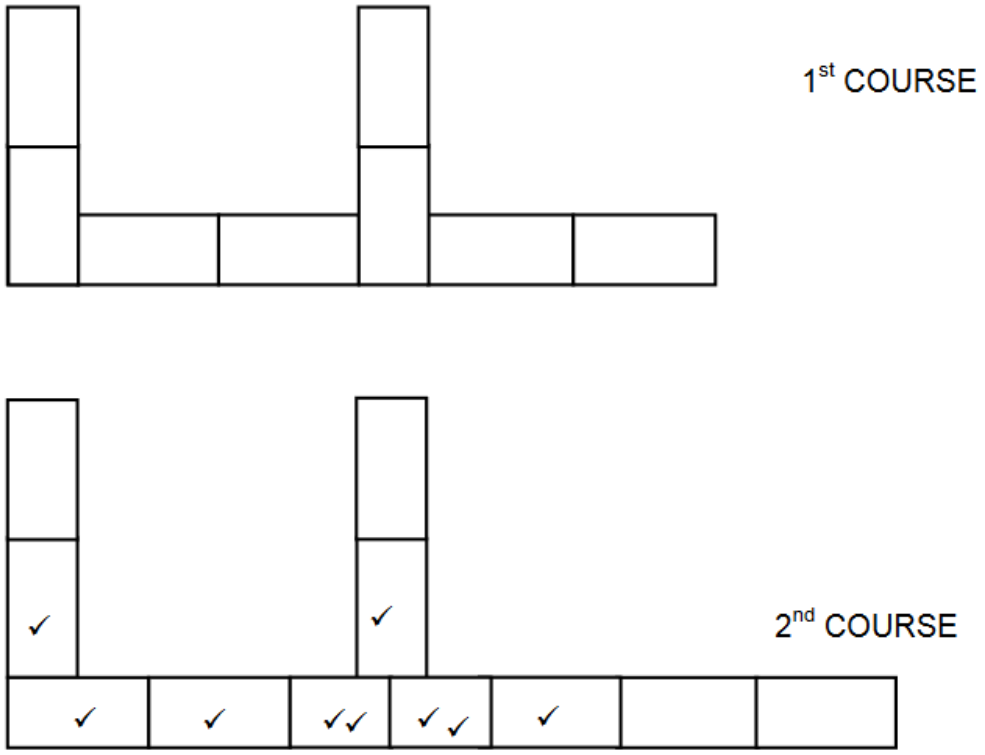
3.3.2 A – Poling boards/planks ✓
B – Strut ✓ (2)

3.4.1 **Volume of a cubic water storage tank:**
= Area of base x height
=S^3
= 4 m ✓ x 4 m ✓x 4 m ✓
= 64 ✓ m^3 ✓ (5)

3.4.2 **Volume of water in tank =** 64 x 1 000 ✓ litres/cubic meter
= 64 000 litres✓ (2)

3.5 A - Spirit level ✓
B – Long straight edge/Straight edge ✓
C – Steel peg/Peg ✓ (3)

3.6



Correctness ✓

Assessment Criteria	Mark
Bricks at corner drawn correctly	2
2 x ¾ bricks	4
Full bricks on each side of ¾ bricks	2
Full brick at T-junction	1
Correctness of drawing	1
Total:	**10**

(10)
[30]

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

4.1 Hand compaction:
- Performed manually using tools such as rammers or tampers. ✓
- Suitable for small areas, shallow trenches, or confined spaces.

ANY ONE OF THE ABOVE

Machine compaction:
- Performed using mechanical equipment such as plate compactors or rollers.
- Used for large areas or deep layers and provides faster, more uniform compaction. ✓

ANY ONE OF THE ABOVE (2)

4.2
- Excavations deeper than 1,5 m must be properly shored, battered, or stepped to prevent collapse. ✓
- Adequate access, such as ladders, must be provided for workers in excavations. ✓ (2)

4.3
- Manhole cover and frame ✓
- Step irons (or ladder rungs) ✓
- Benching ✓
- Channel (invert) ✓ (4)

4.4
- As close as possible to the municipal connection, but not further than 2 m from the boundary fence. ✓
- Every 20 to 25 m on a straight section of a drain line. ✓
- At all important changes of directions. ✓
- At changes of gradient and levels, such as where the ground is terraced. ✓
- All-important junctions. ✓ (5)

4.5
- 100 mm diameter – 1:40 ✓
- 150 mm diameter – 1:60 ✓
- 225 mm diameter – 1:90 ✓ (3)

4.6 4.6.1 Non-return valve ✓ (1)

4.6.2 Locking valve ✓ (1)

4.6.3 B ✓ (1)

4.6.4 To prevent backflow in a pipe system that pumps water to a higher-lying area. ✓ (1)

4.7
- Aerator device ✓
- Pillar mixer tap with one lever ✓
- Sensor tap ✓
- Demand pillar tap/press the tap to trigger the flow of water ✓ (4)

4.8 Sandy water will damage the mechanisms (1) of pressure-reducing valves/ flushing valves/taps. ✓ (2)

4.9 When a section of a galvanised pipe must be replaced but the pipe cannot be rotated (for example, where the pipe is fixed in position or built into a wall). It allows the new section of pipe to be screwed in without turning the existing pipe, making it ideal for repairs in confined or fixed installations. ✓ (1)

4.10 Grey or wastewater is used water from households or industries, such as from sinks, baths, and washing machines, which may contain soaps, detergents, and organic matter. ✓ (2)

4.11 Pillar tap
- More attractive than the Bibcock ✓
- Has a long tail to be connected to a pipe below ✓
- Used in the basin

Bibcock
- Has external threads on the outlet to connect a hose pipe ✓
- Connect a hose pipe ✓ (4)

4.12. 4.12.1 P-trap ✓ (1)

4.12.2 U trap ✓
S trap ✓
Bottle trap
Grease trap
ANY TWO OF THE ABOVE (2)

4.12.3
- To prevent foul gases from entering the building ✓
- To allow wastewater to flow while maintaining a seal against odors
- Allows water to pass through while keeping back the gases✓

ANY TWO OF THE ABOVE (2)

4.12.4
- Sewer gases can escape into the building. ✓
- Unpleasant odours will enter the room

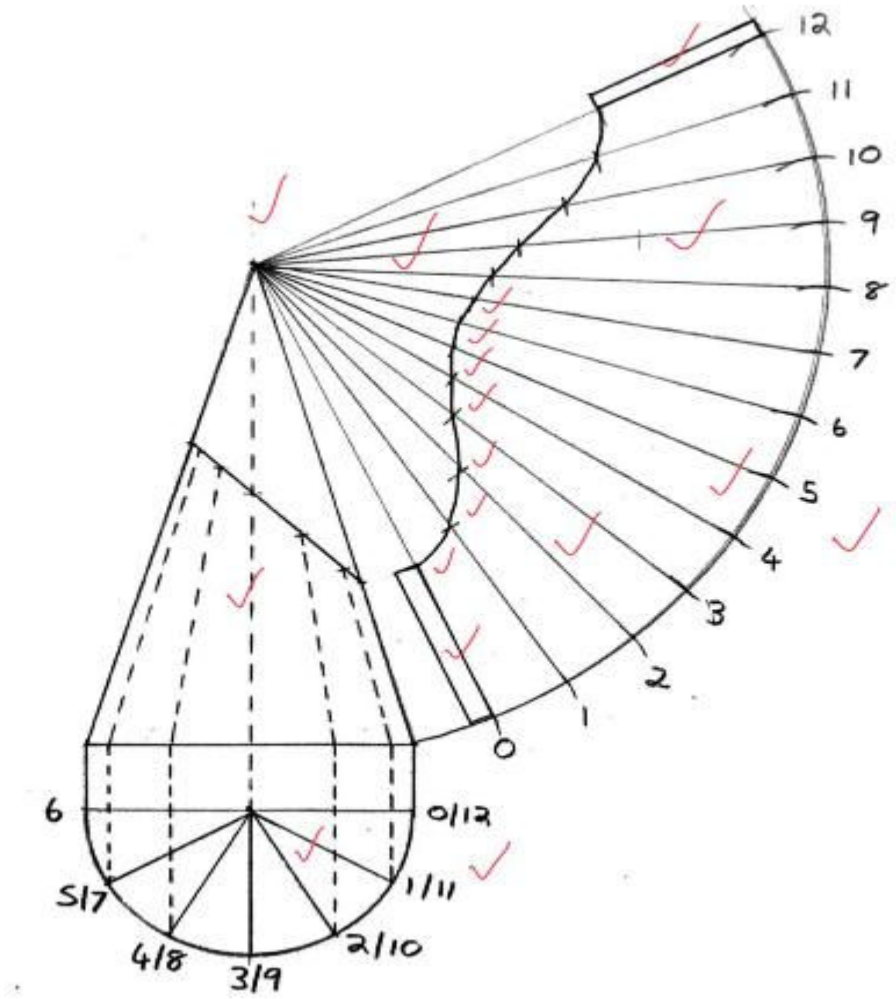
ANY ONE OF THE ABOVE (1)

4.13 The main purpose of an inspection eye on a fitting is to allow access for inspection, cleaning, and removal of blockages in the pipe system. ✓ (1)

[40]

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

5.1



ASSESMENT CRITERIA	MARKS
Apex	1
Cone projection lines	1
Divide into 12 of half circle	1
Numbering of half circle	1
Numbering of development	1
Projection lines of development	4
Two 3 mm seam	2
Correct curve at each point	7
TOTAL	**18**

5.2	5.2.1	Sink unit – single ✓	(1)
	5.2.2	1 ✓	(1)
	5.2.3	Ceramic✓	(1)
	5.2.4	Washbasin ✓	(1)
	5.2.5	Acrylic/cast iron etc. ✓	(1)
	5.2.6	1 ✓	(1)
	5.2.7	Plastic/brass ✓	(1)
	5.2.8	1 ✓	(1)
	5.2.9	Polycop/gavinised/copper. ✓	(1)
	5.2.10	Polycop/gavinised/copper ✓	(1)
	5.2.11	15 mm x 22 mm✓	(1)
	5.2.12	Reducing tee ✓	(1)
			[30]

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

6.1	6.1.1	True ✓	(1)
	6.1.2	False ✓	(1)
	6.1.3	True ✓	(1)
	6.1.4	True ✓	(1)

6.2 Scale or corrosion products ✓ are removed ✓ by subjecting it as an electrode ✓ to an electrical current ✓ in an electrolytic bath. (4)

6.3 It causes pit marks, ✓ which are caused by the chemical reaction ✓ between the metals. (2)

6.4 Zinc has a weak atomic bond with other metals , ✓ and it causes dezincification. ✓ (2)

6.5
- The difference between the electrode potential of two metals. ✓
- Contact resistance at the boundary between two metals. ✓
- Electrical resistance of the electrolyte solution. ✓
- Anode-to-cathode area ratio. ✓
- Presence of a passive film.
- Properties of the electrolyte solution.

ANY FOUR OF THE ABOVE (4)

6.6
- Drain rods ✓
- Plunger ✓ (2)

6.7 Loose clothing can get caught in the moving parts. ✓ (1)

6.8 6.8.1 Water pressure testing pump ✓ (1)

6.8.2 For pressure testing of water systems ✓such as water meters, plumbing lines, pressure vessels, solar systems and sprinkler systems (for both residential and commercial buildings) ✓ (2)

6.8.3
- Keep the tank and pump system clean. ✓
- Grease the piston regularly with water repellent grease. ✓
- Be careful not to damage the piston.
- Use only liquids specified for the test.
- No acid or corrosive liquids may be used.
- Use only clean water. Oil can be used.
- Check pump for damage before use.

ANY TWO OF THE ABOVE (2)

6.8.4
- Check if the machine is not broken. ✓
- Make sure you know how to use this machine. ✓
- Check if all the machines' pipes is not leaking.
- Clean after use.

ANY TWO OF THE ABOVE (2)

6.9
- Machining using a metal lathe ✓
- Hacksaw. ✓
- Ring-type cutter.
- Laser cutting.
- Pipe cutting-threading machine

ANY TWO OF THE ABOVE (2)

6.10
- Electrical PVC snap ✓
- Clamp✓
- PVC hangers and pipe clamp
- Perforated straps

ANY TWO OF THE ABOVE (2)

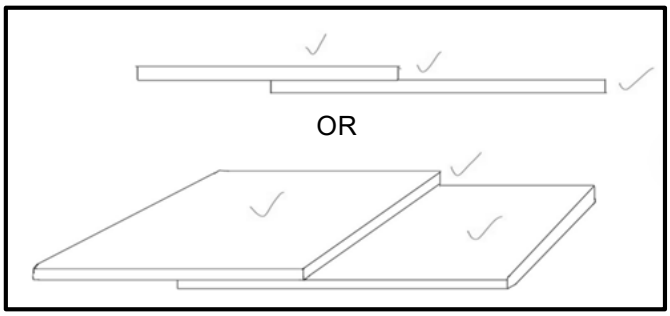
6.11 6.11.1 Electric soldering iron/soldering iron. ✓ (1)

6.11.2 Used to join/solder two pieces of metal together. ✓ (1)

6.11.3
- 50/50 solder (plain/tinman's solder) ✓
- Wiping solder (plumber's solder) ✓
- 60/40 solder (fine solder) ✓
- Lead-free solder ✓ (4)

6.11.4 Steel studs. ✓ (1)

6.11.5



(3)
[40]

TOTAL: 200