higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

WELDERS' THEORY N2

23 November 2022

This marking guideline consists of 5 pages.

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QUESTION 1

1.1
1.1.1 D
1.1.2 E
1.1.3 A
1.1.4 F
1.1.5 G
1.1.6 C

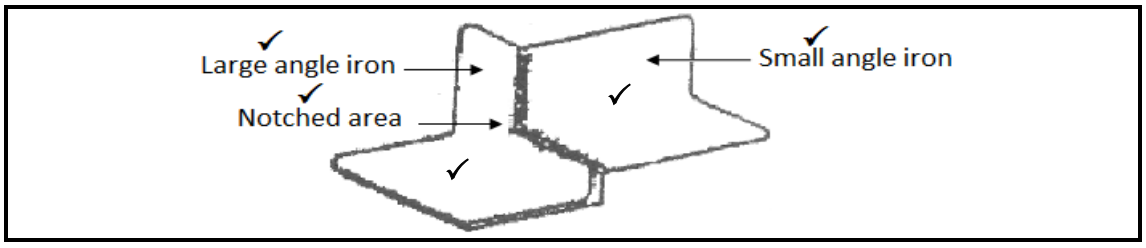
(6 × 1) (6)

1.2
- Ensure that the machine is securely mounted and will not easily move.
- Ensure that the workpiece is securely clamped.
- Always use the correct eye protection.
- Use hearing protection because the grinding process is very noisy.
- Make sure that the correct cutting disc is used.
- Ensure that the cutting disc is secure and not broken or damaged.
- Ensure that the disc is securely fitted with the necessary bearing plates.
- Wear eye protection, as there are many sparks during the cutting process.
- Do not leave off-cuts near the machine, because people may trip over and fall towards the machine.

(Any 4 × 1) (4)
[10]

QUESTION 2

2.1



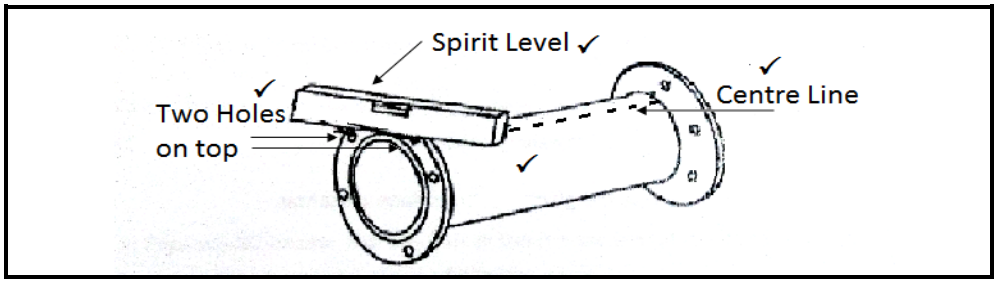
(5)

2.2 2.2.1 Assembly aids are devices made from scrap steel plates and steel sections.

2.2.2 These devices are used to force plates into position for welding.

(2 × 1) (2)

2.3 2.3.1

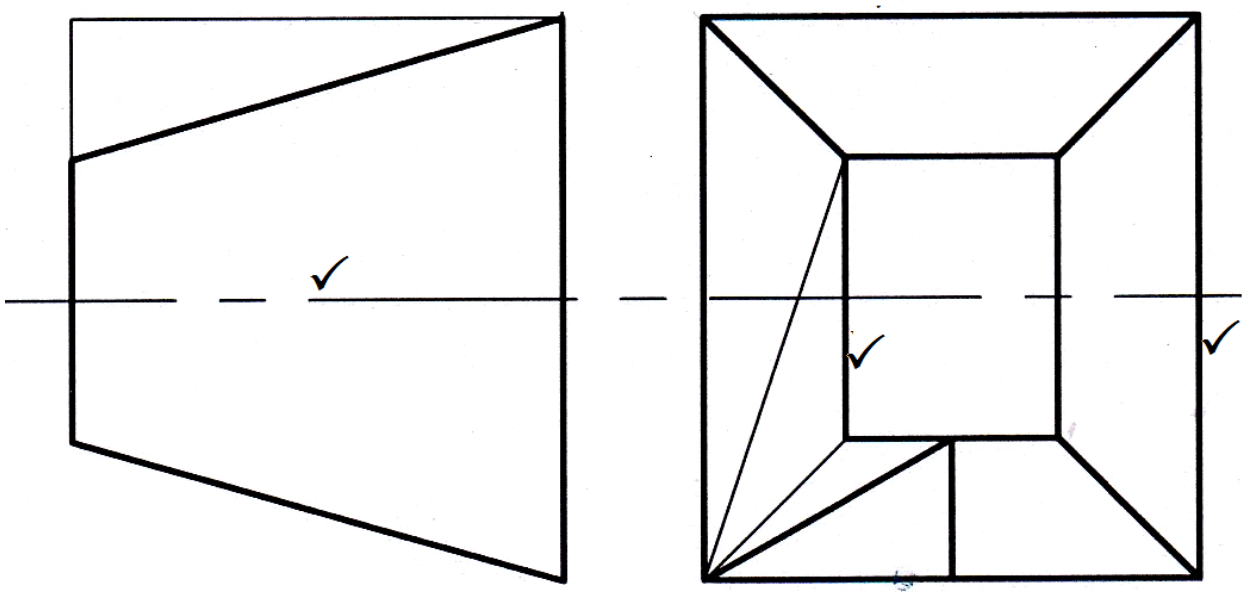


2.3.2
- Draw a centre line on the top of the pipe.
- Insert the flange by positioning it with two holes at the top. A spirit level can be used to ensure the two holes are level.
- The centre line of the pipe should be exactly midway between the two holes. The flange can be tack-welded.
- Follow the same procedure on the opposite side of the pipe, using the same centre line.

(2 × 4) (8)
[15]

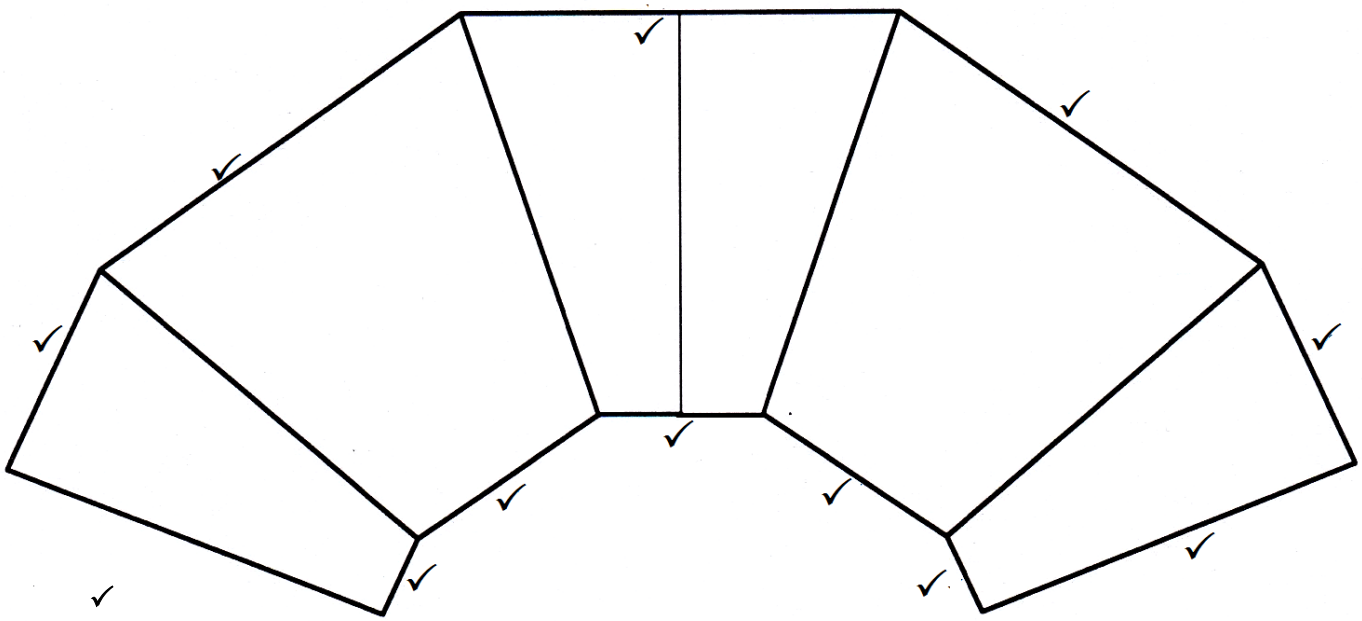
QUESTION 3 (DIAGRAM SHEET)

3.1



(3)

3.2



(12)
[15]

QUESTION 4

4.1
- A bench grinder or angle grinder is used when performing the spark test.
- Hold the piece of metal which you want to test lightly against the rotating grinding wheel.
- If the sparks have long, yellow carrier lines with small explosions, it is low-carbon steel.
- If the sparks have shorter yellow lines with larger explosions, it is medium carbon steel.
- When the yellow lines are even shorter and brighter and the explosions are very clear with many star bursts, it is high-carbon steel. (5)

4.2
- Aluminium windows
- Aluminium patio doors
- Aluminium motor vehicle components, e.g. engines and gearbox
- Aluminium foil
- Aluminium pots, pans, kettles (5)

4.3
- Ferrite steel
- Martensitic steel
- Austenitic steel (3)

4.4
- Tough-pitch copper
- Deoxidised copper (2)

[15]

QUESTION 5

5.1
- Case-hardening is a method used to produce a hard surface skin on steel.
- The outer skin will
- have a good wearing surface.
- The strong and tough inner core
- can resist shock loads. (5)

5.2
- Tempering removes stresses and strains.
- It reduces brittleness.
- It introduces toughness. (3)

5.3
- Tensile test
- Nick bend test
- Guided bend test
- Free-bend test
- Impact test (5)

5.4
- King post
- Strut
- Queen post (2 × 1) (2)

[15]

QUESTION 6

6.1 A – Gas cylinder
B – Power source
C – Earth/Negative
D – Welding gun
E – Workpiece (5)

6.2 6.2.1 True
6.2.2 True
6.2.3 True
6.2.4 False
6.2.5 False
6.2.6 True
(6 × 1) (6)

6.3 Preheating
- It is applied to the base metal before welding or cutting.
- Preheating assists the weld metal to fuse properly.

Post heating
- It is applied after the welding process is complete
- The purpose of post heating a weld is to slow down the cooling rate of the weld to avoid brittleness and loss of weld strength. (2 × 2) (4)

[15]

QUESTION 7

7.1
- Oxide on the surface
- Flakes
- Oil or grease
- Paint
- Lamination (5)

7.2
- Ensure that the correct personal protective equipment (PPE) is worn.
- Check for correct gas pressure.
- Ensure that the workspace is free of flammable items.
- Ensure that the operator of the equipment is well-trained.
- Ensure that the work area is well-ventilated. (5)

7.3
- A tracing head follows the pattern of the drawing template,
- the cutting head on the opposite side of the machine
- follows the same pattern and is connected to a gas cutting mechanism
- similar to a cutting torch and automatically cuts
- a replica out of a steel plate on the cutting table. (5)

[15]

TOTAL: 100

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