higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

ENGINEERING FABRICATION - BOILERMAKING
NQF LEVEL 4

17 November 2022

This marking guideline consists of 5 pages.

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SECTION A

QUESTION 1

1.1	1.1.1	False
	1.1.2	False
	1.1.3	True
	1.1.4	True
	1.1.5	False
	1.1.6	True
	1.1.7	False
	1.1.8	True
	1.1.9	True
	1.1.10	True

(10 × 1) (10)

1.2	1.2.1	D
	1.2.2	F
	1.2.3	E
	1.2.4	B
	1.2.5	C

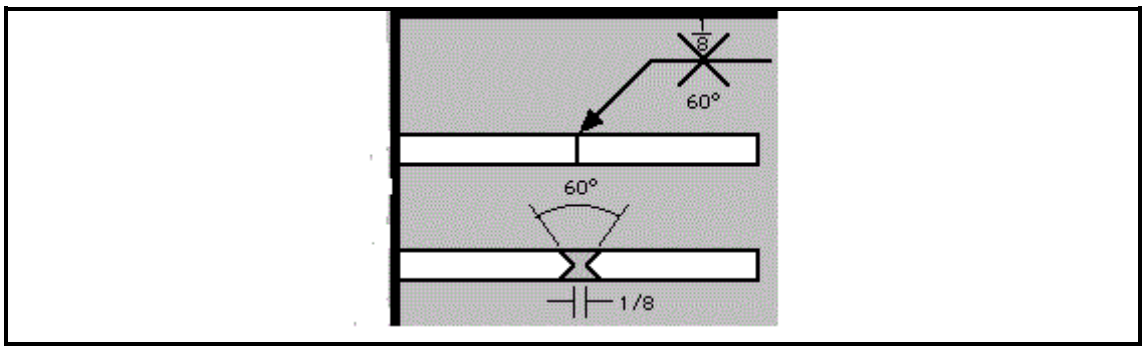
(5 × 1) (5)
[15]

TOTAL SECTION A: 15

SECTION B

QUESTION 2

2.1



DOUBLE V WELD SYMBOL (2)

2.2
- Y° = part of circle
- 360° = full circle
- π = (pi) constant used in calculating circular objects (3)

2.3
- They must meet the specifications and calibrations as described in the manufacturer's manual.
- All the equipment must be in good working order.
- All the equipment must be tested and checked before use. (3)

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2.4
- Because water leakage can cause a lot of damage to property, the air or pneumatic leak test is first carried out to check if there is a leak.
- Thereafter the hydraulic leak test is carried out to test the pressure.

(2 × 2) (4)

2.5
- Point datum
- Line datum
- Edge datum
- Surface datum (4)

[16]

QUESTION 3

3.1
- A third-angle orthographic projection is an orthographic projection system showing the top view above the front view
- and the right view positioned
- on the left-hand side of the front view. (3)

3.2
A – Rafter (top chord)
B – Node point/Apex
C – Vertical bracing strut
D – Bottom chord
E – Bracing (Any 3 × 1) (3)

3.3
- Always lift with your back straight.
- Keep your elbows in.
- Bend your knees.
- Keep your feet slightly apart.
- Use your knees and legs to help lift the load. (5)

3.4
- Check all equipment thoroughly before using it.
- Make sure that the area below a hoist is clear when using the hoist.
- Report any faults and a qualified person must repair them before use.
- A competent person must operate the hoist. This person is also responsible for slinging the load correctly.
- Throw away any defective hoisting equipment.
- Check the safe working load (SWL) before using any hoisting equipment.
- Use proper slinging methods. (Any 5 × 1) (5)

[16]

QUESTION 4

4.1
4.1.1 ISO = isometric drawing
4.1.2 P&ID = piping and instrument drawing or diagram/piping and instrumentation diagram
4.1.3 WOG = water, oil and gas
4.1.4 FE = Flange end

(4 × 1) (4)

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4.2

SAMPLE OF A JOB CARD

CLIENT NAME: ✓

CLIENT ADDRESS: ✓

CLIENT MOBILE NUMBER: ✓

DATE✓	ITEM MANUFACTURED✓	MATERIAL NEEDED✓	QUANTITY✓
Time allocated: ✓			
Time spent: ✓			

Signature of manufacturer✓_____
Signature of supervisor✓_____

(NOTE: The samples may differ in format, but the contents must be similar.)

(Any 5 × 1) (5)

4.3 4.3.1 B = True horizontal
4.3.2 C = True vertical
4.3.3 A = Find level at 45° angle

(3 × 1) (3)

4.4 Offset = $\sqrt{Travel^2 - Advance^2}$✓
= $\sqrt{1500^2 - 250^2}$✓✓
= 1 479 mm✓ (4)

[16]

QUESTION 5

5.1 5.1.1 Yes (1)
5.1.2 Spot-welding (1)

5.2
- Laser cutters
- Plasma cutters
- Thermal cutters
- Wire cutters
- Shearing machines
- Water cutters
- Band saws
- Flame cutters

(8 × 1) (8)

5.3
- CNC systems cost much more to establish than conventional systems.
- Highly skilled machinists are required to operate conventional machines.
- Conventional machines have high labour costs.
- CNC systems have high volume throughput or production.
- CNC systems save time. (Any 4 × 1) (4)

5.4
5.4.1 8 mm (1)
5.4.2 Between 0,2 mm/rev and 0,8 mm/rev (2)
5.4.3 Between 0,4 mm/rev and 0,8 mm/rev (2)

5.5
5.5.1 'Z' - middle finger
'Y' - forefinger (2)

5.5.2 Sliding table (2)

5.6
- One can check if there are any errors.
- The alarm or error message will be heard.
- The error can be located and repaired. (3)

5.7
- The type of metal being cut
- The speed and feed that are used
- The type of cutting tool that is used (3)

5.8
5.8.1 The F-code is the feed rate and is either in millimetres per minute or inches per minute.

5.8.2 The S-code indicates to the machine at what speed the spindle must rotate in revolutions per minute.
(2 × 2) (4)

5.9
- Misalignment of the tips in the holder.
- Misalignment of the tool holder in the CNC machine spindle.
- Inappropriate feed rates, speeds and workpiece material.
- Inappropriate coolant and coolant feed. (4)

[37]

TOTAL SECTION B: 85
GRAND TOTAL: 100

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