higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

ENGINEERING FABRICATION – SHEET METAL WORK
NQF LEVEL 3

10 March 2020

This marking guideline consists of 5 pages.

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QUESTION 1

1.1 A
1.2 D
1.3 C
1.4 A
1.5 B
1.6 C/D
1.7 D
1.8 B
1.9 A
1.10 A
1.11 C
1.12 B
1.13 A
1.14 C
1.15 D
1.16 D
1.17 A
1.18 A

(18 × 1) **[18]**

QUESTION 2

2.1 True✓ because it reduces the force of the blow✓

2.2 True✓ because the jaws of an open-ended spanner stretch easily, damaging the edges of bolts and nuts✓

2.3 True✓ because the table of the pedestal drilling machine can be set to different angles✓

2.4 True✓ because the centre punch point is grounded to 90°, aligning the point of a drill✓

2.5 True✓ because the one leg of the callipers can hook to the edge of the workpiece✓

2.6 False✓ because the loose hook slides the distance of its own thickness to permit the inside and outside measurements to be precise✓

2.7 False✓ because the oblique pipe is not a normal round pipe✓ it needs a specific measuring method to determine the circumference

2.8 True✓ because the common central sphere determines the position of the pipe in the connection✓

2.9 False✓ because all measurements are measured from the setting-out points to ensure accuracy✓

(9 × 2) **[18]**

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QUESTION 3

3.1 3.1.1 Coke is used in the furnace as a source of heat for the melting operation.

3.1.2 Limestone is used as a flux to combine with the iron-poor elements in the ore forming a slag.

(2 × 2) (4)

3.2 3.2.1 0,14%✓ – 1,5%✓

3.2.2 2%✓ – 4,5%✓

(2 × 2) (4)

3.3 3.3.1
- White cast iron
- Grey cast iron
- Mottled/Malleable cast iron
- Low-carbon steel
- Medium-carbon steel
- High-carbon steel
- Tool steel (Any TWO)

3.3.2
- Copper
- Tin
- Lead
- Zinc
- Antimony
- Aluminium (Any TWO)

3.3.3
- High-speed steel
- Manganese steel
- Nickel steel
- Chromium steel
- Nickel-chromium steel
- Stainless steel
- Vanadium steel (Any TWO)

(3 × 2) (6)

3.4
- Check that all safety equipment are in place.
- Ensure that all tools are in working order.
- Always wear and use PPE.
- Keep the work area clean.
- Use the correct tools and equipment.
- Apply safety procedures when using welding equipment.

(Any relevant 4 × 1) (4)

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3.5
- Nearest telephone
- Nearest first-aid box
- Main electrical switch
- Location of fire extinguishers
- Emergency exits (5)

3.6
- Ventilation fans
- Fume filters
- Air supply to welding hoods (3)

3.7
- Crater crack
- Face crack
- Heat-affected zone crack
- Lamellar tear
- Longitudinal crack
- Root crack (Any relevant 4 × 1) (4)

3.8
- First step: Close the fuel cylinder valve.
- Last step: Close the oxygen-torch valve. (2)

3.9
- CAD-pictorial drawings
- Single-line/Double-line drawings
- Detail drawings
- Section drawings
- Isometric/Oblique pictorial drawings
- Sheet-metal drawings (Any 3 × 1) (3)

3.10
- Chemicals
- Abrasions
- Cuts
- Heat (4)

3.11
- When there is a possibility of overhead falling objects
- When there is a possibility of head bumping
- When working close to exposed electrical conductors (3 × 2) (6)

3.12 Working load limit (1)

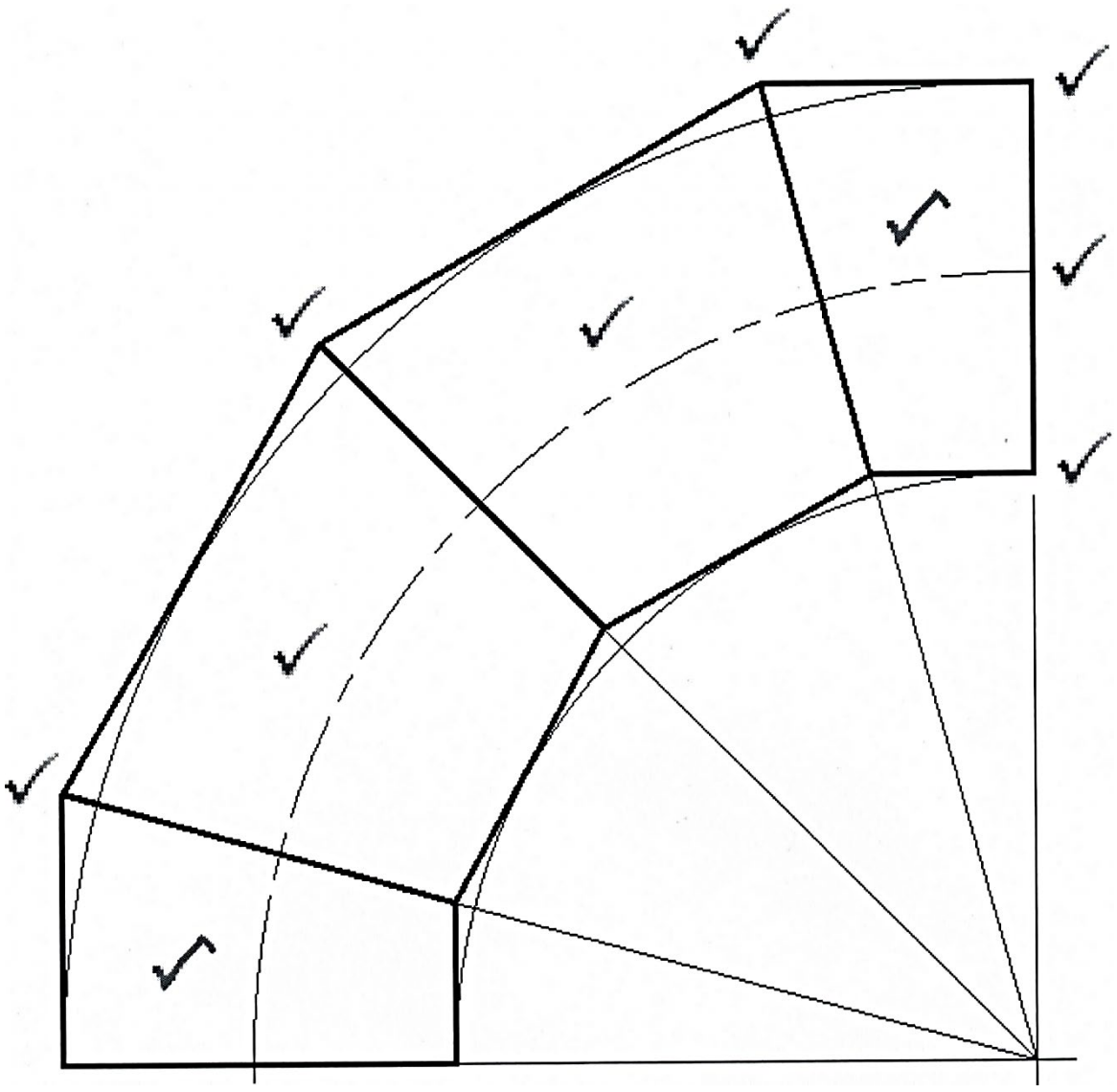
[46]

QUESTION 4

4.1 $Rafter^2 = run^2 + rise^2$✓
$Rafter = \sqrt{run^2 + rise^2}$✓
$= \sqrt{3,124^2 + 2,341^2}$✓
$= 3,904$ m✓ (4)

4.2 $A = ½b \times h$✓
$= (0,5 \times 3,124) \times 2,341$✓
$= 1,562 \times 2,341$✓
$= 3,657\ m^2$✓✓ (5)

4.3



Inner curve: 1 mark
Centre curve: 1 mark
Outer curve: 1 mark
2 × 15° inclines: 2 marks
45° incline: 1 mark
2 × 30° segments: 2 marks
15° segments: 2 × ½ marks (9)

[18]

TOTAL: 100

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