higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

ENGINEERING FABRICATION: SHEET METAL WORK
NQF LEVEL 4

28 November 2023

This marking guideline consists of 6 pages.

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SECTION A

QUESTION 1

1.1 False
1.2 True
1.3 False
1.4 True
1.5 True

(5 × 1) **[5]**

QUESTION 2

2.1 F
2.2 E
2.3 G
2.4 H
2.5 B
2.6 C
2.7 I
2.8 D
2.9 J
2.10 A

(10 × 1) **[10]**

TOTAL SECTION A: 15

SECTION B

QUESTION 3

3.1
- Fibreglass
- Resin
- Aluminium

(3)

3.2
3.2.1 HPS: High pressure steam
3.2.2 HWHR: Hot water heating return
3.2.3 RL: Refrigerant liquid
3.2.4 CWR: Condenser water return
3.2.5 D: Drain

(5 × 1) (5)

3.3
3.3.1 To divert ducting around obstructions.
3.3.2 To change the duct size in an elbow.
3.3.3 To change the direction of duct work.

(3 × 1) (3)

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3.4 3.4.1 To change the direction of the duct (1)

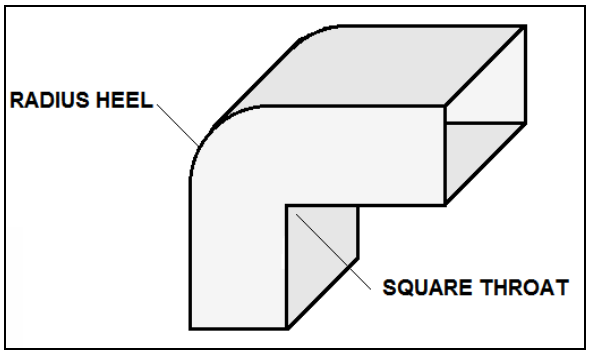
3.4.2
- Throat and heel
- Angle (2)

3.5 3.5.1 It makes it easier to read the drawing✓ and to see which lines are part of which layout.✓ (2)

3.5.2 By using symbols (1)
[17]

QUESTION 4

4.1



(✓✓ – Throat and heel labels)
(✓✓ – Any acceptable sketch)
(4 × 1) (4)

4.2 4.2.1 To ensure that one has the certified specifications from the supplier.

4.2.2 To avoid abrupt changes in direction at air-handling equipment inlets and outlets.

4.2.3 To allow service agents to physically get to a piece of equipment when servicing is done.
(3 × 2) (6)

4.3 4.3.1 To protect the system against electrical faults.✓

4.3.2 To protect it against overload✓ or to protect it against under voltage/voltage drop✓ (Any ONE)

4.3.3 For servicing the unit✓ or for emergency stopping✓ (Any ONE)
(3 × 1) (3)

4.4
- Select all terminals for a zone or room at approximately the same pressure drop.
- Ensure that all air flow from a terminal does not exceed the distance to a sidewall.
- Ensure that air distribution over a room or space is approximately even.
- Ensure that ceiling or wall terminals do not discharge directly at a column or other permanent obstruction. (4)

[17]

QUESTION 5

5.1 5.1.1 A treatment that uses an acid to remove scale.

5.1.2 A treatment that removes any free iron contamination from stainless steel surfaces.

(2 × 2) (4)

5.2
- Do you have the correct protective clothing?
- Are there workers in the area who may be harmed by the light from your welding?
- Are there yellow screens to partition the light rays in the area?
- Are there any flammable materials near where you will be welding?
- Are there any flammable gasses, vapour or liquids near where you will be welding?
- Have any of the materials or containers you will be working with on or near to contained or come into contact with flammable or explosive materials.

(Any 5 × 1) (5)

5.3
- The size of the weld against the specification
- The type of weld
- The thickness of the weld
- The dimensions of the weld
- The penetration of the weld
- The tolerance and the distortion allowances (6)

5.4
- A welding torch can create heat against the cylinder wall or valve assembly. This can weaken and melt the shell of the cylinder.
- The torch can heat up the cylinder, that will lead to a rise in temperature and pressure inside the cylinder that may result in an explosion. (Any ONE) (2)

[17]

QUESTION 6

6.1 6.1.1 A program that tells a computer how to do a particular job.

6.1.2 Is a computer processing unit where the computer software is loaded on to the computer hardware

6.1.3 Is a set of instructions used for solving mathematical problems.

(3 × 2) (6)

6.2 6.2.1 D
6.2.2 C
6.2.3 A
6.2.4 B
6.2.5 E

(5 × 1) (5)

6.3
- Reading the data
- Converts data into co-ordinates for the machine tool
- Checks machine limitations like allowable feeds and speeds
- Develops suitable speeds and feed for the machine
- Develops motion instructions for the machine
- Sets codes for various instructions
- Printing out a listing of the programs for checking
- Print out error codes (8)

6.4
- The scale of the drawing
- The plan
- The sections
- The isometric projections
- The machining symbols that inform about the types of edges and finishes
- The machining procedure
- The initial and final size of the work-piece (Any 5 × 1) (5)

6.5
- If the tool is blunt the material will burn.
- If the tool has a gap on the cutting edge then a raised mark will appear along the edge of the moulded edge of the material.
- If the machine is travelling too fast the workpiece will be very rough.
- If the tool data has been set up incorrectly then the finished component will not have the correct size.
- If the tool is slightly worn it will result in incorrect dimensions. (5)

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6.6
- Follow the instruction in the CNC manual.
- Read the notices on the CNC machine.
- Read the workshop notice boards.
- Wear protective clothing.
- Keep workshop neat and tidy.
- Follow the correct procedures for turning the machine on or off.
- Follow the procedures for inserting tools and installing the workpiece.

(Any 5 × 1) (5)
[34]

TOTAL SECTION B: 85
GRAND TOTAL: 100

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