higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

MANUAL MANUFACTURING
NQF LEVEL 2

15 November 2022

This marking guideline consists of 5 pages.

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QUESTION 1

1.1 Safety in the workshop not only protects workers from injury and illness, it can also lower injury/illness costs, reduce absenteeism and turnover, increase productivity and quality, and raise employee morale.
(Marker to use discretion) (2)

1.2 1.2.1
- Improper lifting techniques
- Blocking the fire exit
- Disabling safety devices
- Taking unsafe positions
- Not using a step ladder
- Working when one's view is obscured (Any 5 × 1) (5)

1.2.2
- Lack of training
- Operation of equipment in an inappropriate manner
- Office congestion
- Poor housekeeping
- Fire hazards (Any 5 × 1) (5)

1.2.3 A hazard is a potential source of harm. Substances, events, or circumstances can constitute hazards when their nature would allow them, even just theoretically, to cause damage to health, life, property, or any other interest of value. (Marker to use discretion) (2)

1.2.4
- Safety procedures
- Education
- Colour coding
- Good housekeeping
- Personal protective equipment
- Engineering design/Safety machine guards (Any 4 × 1) (4)

1.3 It is to promote the health and safety of all workers,✓ as well as other people that may be affected as a result of work-related activities.✓ (2)
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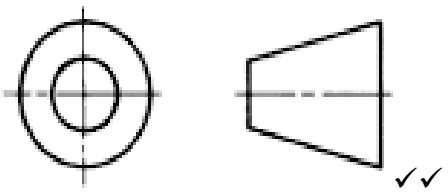
QUESTION 2

2.1 The purpose of an engineering drawing is to clearly and accurately capture all geometric features of a product or component✓ so that a manufacturer or engineer can produce the required item.✓ (2)

2.2
- T-square
- Drawing table
- Set squares
- Clutch pencils
- Erasers
- Compass
- Dividers
- Rulers
- Scale ruler
- Protector
- Stencils
- French curves
- Flexible curves (Any 5 × 1) (5)

2.3



✓✓ (2)

[9]

QUESTION 3

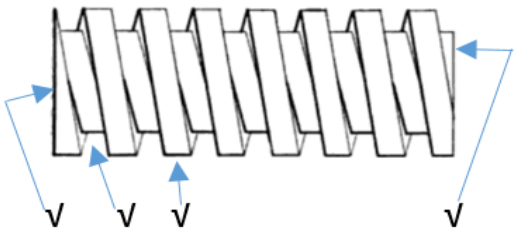
3.1 The purpose of marking out is to transfer lines from a drawing to a work piece. (2)

3.2
- Never use measuring instruments on rotating or moving machinery.
- All instruments and tools must be used for what they were designed for.
- Work pieces can have sharp edges and can inflict serious cuts.
- Heavy work pieces can fall and injure workers' feet.
- Work pieces that have just been machined may be hot.
- Be careful of electrical points and electricity close to where the instrument will be used. (Any 5 × 1) (5)

3.3
3.3.1 Anvil
3.3.2 Frame
3.3.3 Spindle
3.3.4 Sleeve
3.3.5 Datum line
3.3.6 Thimble
3.3.7 Ratchet

(7 × 1) (7)

3.4



√ √ √ √ (√√correctness) (6)

3.5
- Incorrect and careless use
- The blade is too soft
- The blade is too hard
- Wrong blade type for the type of material
- Too coarse a pitch when used on thin sections (5)

[25]

QUESTION 4

4.1
4.1.1 Welding machine
4.1.2 Arc
4.1.3 Welded area
4.1.4 Electrode
4.1.5 Welding rod clamp or holder
4.1.6 Work cable/Welding return
4.1.7 Earth clamp/Earth return
4.1.8 Electrode cable/Welding lead

(8 × 1) (8)

4.2 Gas welding is when the gas flame is gentle in nature✓ and allows enough heat to the metal to form a molten puddle that moves between the metals being joined with or without a filler.✓
Gas cutting requires the metal to be heated so that it melts✓ and then forced by increasing the pressure to remove the metal.✓ (Marker to use discretion) (4)

4.3 4.3.1
- Check the handle for cracks.
- The handle must be secured to the soldering iron housing.
- Check the electric cord for cracks, burn marks and loose connections.
- Never use a soldering iron while standing in water.
- Wear eye protection.
- Avoid breathing in smoke/fumes generated during soldering.
- Use pliers or a vice to hold the work piece to avoid burns from heated objects. (Any 5 × 1) (5)

4.3.2
- The tip size
- Heat needed
- Size of the soldered area
- Cost of soldering iron/soldering station (4)

4.3.3
- The soldering iron must be plugged in and the tip heated.
- Apply solder with a rosin flux to the hot tip.
- Ensure that about 4 mm of the tip is covered by a thin layer of solder. (3)

[24]

QUESTION 5

5.1 Good housekeeping means keeping the work area tidy and free from hazards. (Marker to use discretion) (2)

5.2
- Articles falling from above.
- Workers tripping over objects on floors.
- Workers slipping on greasy, wet or dirty floors.
- Hands or other parts of the body being cut by nails, wire, steel straps or splinters which stick out from untidy piles of materials.
- Staff bumping against materials which protrude or stick out because they have been badly stacked or placed. (Any 5 × 1) (5)

5.3
- Point out hazards that may not be obvious.
- Draw attention to health and safety hazards.
- Provide general information and directions.
- Remind employees where personal protective equipment must be worn.
- Show where emergency equipment is located.
- Indicate where certain actions are prohibited. (Any 5 × 1) (5)

5.4 Table of content

Method	**Cast iron**	**Mild steel**	**Cast steel**	**High-speed steel**
Sound test	Dull sound	Slightly higher ring	High ring	Very clear, high ring
Spark test	Yellow torpedo sparks with feathery tail	Stream of long white sparks	Brushy spark stream with secondary burst	Dull red broken line of sparks
Fracture test	Grey crystalline	Light grey medium crystalline	Very fine crystalline structure	Light grey fine crystalline
Machining test	Cuts easily, black curly swarf	Cuts easily, white curly swarf	Shavings break into short pieces	Cuts fairly easily, long swarf

(10)

[22]

TOTAL: 100

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