higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

ENGINEERING FUNDAMENTALS
NQF LEVEL 2

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This marking guideline consists of 6 pages.

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QUESTION 1: SOUTH AFRICAN MANUFACTURING, ENGINEERING AND TECHNOLOGY

1.1 Mechanical engineering

- Sector is responsible for the development
- Production
- Marketing of roller bearings
- Hydraulics
- Pneumatics (Any 3 × 1) (3)

Leading firms in the sector are SKF and Reunert. (Any 1 × 1) (1)

Chemical engineering

- Sector is responsible for the development
- Production
- Marketing of plastics
- Lubricants
- Fuels
- Paints
- Fertilisers
- Medicines (Any 3 × 1) (3)

Leading firms in this sector include Sasol and AECI. (Any 1 × 1) (1)

Electrical/Electronic engineering

- Sector is responsible for the development
- Production
- Marketing of electrical motors
- Cables
- Generators
- Generation of electricity (Any 3 × 1) (3)

Leading firms in this sector include MECER and Phillips. (Any 1 × 1) (1)

Civil engineering

- Sector is responsible for the development
- Production
- Marketing of infrastructure projects
- Roads
- Bridges (Any 3 × 1) (3)

Leading firms in this sector include Murray and Roberts and Stocks.
(Any 1 × 1) (1)
(Any 3 × 4) (12)

1.2
- Mines and mining processes
- Clothing and textiles
- Road and rail transport
- Car, truck and bus manufacturing
- Service industry
- Tourism and hospitality
- Agriculture
- Forestry
- Energy generation
- Explosives
- Fish and fish processing
- Roads, dams and building construction
- Weapon manufacturing (Any 5 × 1) (5)

1.3 1.3.1 The Constitution (1)

1.3.2
- Human dignity and equality
- Advancement of human rights and freedom
- Non-racialism and non-sexism
- That the constitution is the highest law and that everyone should obey the rule of law
- Universal obligation which each South African adult has, for example to participate in voting (5)

1.4
- Bending work in a vice
- Placing the workpiece over an anvil
- Placing work over a face
- Using a hardy or pritchel on heated metal (Any 3 × 1) (3)

1.5
- Forge
- Tongs
- Hammers
- Anvil
- Anvil tools (Any 4 × 1) (4)

1.6
1.6.1 D
1.6.2 C
1.6.3 E
1.6.4 B
1.6.5 A
1.6.6 I
1.6.7 J
1.6.8 F
1.6.9 G
1.6.10 H

(10 × 1) (10)
[40]

QUESTION 2: SAFETY PRACTICES IN THE ENGINEERING WORKSHOP

2.1
2.1.1 Grind down the mushroom-headed chisel.✓✓
2.1.2 Use a screw driver with a flat point of the right size.✓✓
2.1.3 Grip the wrench securely having the open jaws facing you✓ and pull, do not push.✓
2.1.4 Eliminate unsafe act by using push sticks✓✓

(4 × 2) (8)

2.2
- Identifying machinery and different machine parts by colour codes helps people to recognise them quickly.
- It also makes people aware of danger and reduces industrial accidents.
- Workers can act much quicker in emergency situations. (3)

2.3
- Provide maximum protection.
- There should not be any hazards such as splinters and pinch points on a guard.
- It should be a permanent part of the machinery without weakening its structure.
- Efficient operation of the machine should not be affected by the guard.
- It should be strong enough to withstand the normal wear and tear.

(5 × 1) (5)

2.4
- Warning notices should be affixed in a prominent place indicating the supply voltage.
- State whether the power supply is AC or DC.
- Place a 'DANGER' or 'DO NOT START' notice close to the start/stop buttons to warn that maintenance work is in progress on the machine.
- Ensure that the switches are locked out.
- Label the switches to indicate to which equipment they apply.
- Label the main switch prominently so that there would not be any confusion in an emergency. (Any 5 × 1) (5)

2.5
2.5.1 Decibel
2.5.2 Loose clothing
2.5.3 Safety programme
2.5.4 Emergency button
2.5.5 Accident report

(5 × 1) (5)

2.6
- Physical hazards
- Chemical hazards
- Mechanical hazards
- Biological hazards (4)

[30]

QUESTION 3: BASIC FIREFIGHTING

3.1 3.1.1 True
3.1.2 False
3.1.3 True
(3 × 1) (3)

3.2 3.2.1 Class A✓– It is because it is an ideal cooling, soaking and penetrating agent.✓

3.2.2 Class B, C and E✓ – It is a flame interrupting agent.✓

3.2.3 Class B and C✓– It is because it is a smothering and blanketing agent.✓
(3 × 2) (6)

3.3 The metal safety pin prevents the operating lever from closing accidently. (1)
[10]

QUESTION 4: BASIC FIRST AID

4.1
- It cuts time away from work due to injuries or illness.
- It makes workers safety conscious.
- It reduces disablement and disruption of production.
- It develops a team spirit among the workers trained in first aid. (Any 2 × 1) (2)

4.2
- It gives them valuable knowledge to be used both at work and at home.
- It saves lives and reduces pain and disability.
- It increases their usefulness to others.
- It gives workers an added feeling of esteem. (Any 2 × 1) (2)

4.3 37 degrees Celsius (1)

4.4 Electric shock is a condition resulting from an electrical current✓ flowing through the body✓ (2)
[7]

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QUESTION 5: HEALTH AND THE ENVIRONMENT

5.1
- When two or more safety representatives have been designated
- An employer is required to establish one or more safety committees (2)

5.2
- A safe way of doing each job sequence is developed.
- All the various hazards are noted.
- Different steps and safe methods for doing jobs are clearly described.
- Training is systematic and thorough.
- The reason for wearing personal protective equipment is explained.
- The proper use and care of personal protective equipment is taught in detail. (Any 5 × 1) (5)

5.3
- An SHE representative should be employed in a full-time capacity in the workplace.
- He/she should be informed of and familiar with the conditions and activities in that workplace. (Any 2 × 1) (2)

5.4
- Physically inspect the workplace items.
- Use the appropriate inspection check list.
- If the item inspected is in order write 'OK' in the space provided.
- If the item inspected is not in order write 'DEFECT' in the space provided.
- Further comments, if any, should be recorded it in the space provided, as well as the date and the deviation report should be signed. (Any 4 × 1) (4)

[13]

TOTAL: 100

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