higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

ENGINEERING PRACTICE AND MAINTENANCE
NQF LEVEL 3

20 November 2024

This marking guideline consists of 5 pages.

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QUESTION 1

1.1
1.1.1 F
1.1.2 H
1.1.3 E
1.1.4 A
1.1.5 D
1.1.6 J
1.1.7 B
1.1.8 I
1.1.9 C
1.1.10 G

(10 × 1) (10)

1.2 1.2.1 A product must work every time it is used✓ and in all types of conditions.✓

1.2.2 A product should not require a lot of ongoing maintenance.✓ It should be easy and cheap to maintain.✓

1.2.3 A product should work well in any environment✓ or under any condition.✓

1.2.4 It should be easy to understand✓ and operate a product.✓

1.2.5 A product must be safe to use✓ and to manufacture.✓

(5 × 2) (10)
[20]

QUESTION 2

2.1
- Direct observation techniques
- Measurement-based testing
- Operational testing
- Manufacturer manuals
- Simulations
- Trial and error
- Questioning

(Any 5 × 1) (5)

2.2
2.2.1 False
2.2.2 True
2.2.3 False
2.2.4 False
2.2.5 False
2.2.6 True

(6 × 1) (6)

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2.3
- Did the machine suddenly stop working?
- Did the machine make any unusual noises before it was stopped?
- Where did the noise come from?
- Did the fault occur before?
- Were the readings on the gauges abnormal?
- Did any overheating occur at the source of noise?
- Did any unusual smells come from the machine?
- Did any unusual vibrations come from the machine?
- Were any modifications carried out recently on the machine? (9)

[20]

QUESTION 3

3.1
3.1.1 M
3.1.2 E
3.1.3 M
3.1.4 M
3.1.5 E
3.1.6 E
3.1.7 M
3.1.8 P
3.1.9 P
3.1.10 H

(10 × 1) (10)

3.2
- Identify burnt-out or worn-out components.
- Look for malfunctions in components with coils.
- Look for loose connections.
- Check for faulty wiring. (4)

3.3
- Verify the fault.
- Look for the obvious.
- Correct not only the symptoms but also the fault and its causes.
- Do not take anything for granted.
- Ensure the safety of people and property.
- Follow professional ethics.
- Use effective fault-finding techniques to diagnose faults accurately.
- Record all processes. (Any 6 × 1) (6)

[20]

QUESTION 4

4.1 4.1.1 Cooling can prevent various materials✓ from decaying.✓

4.1.2 Because high temperatures increase resistance to the flow of electricity,✓ the current will stop flowing.✓

4.1.3 A short circuit✓ can happen at high temperatures.✓

4.1.4 High temperatures reduce✓ the effectiveness of lubrication.✓

4.1.5 Overheating can destroy a component✓ or cause an explosion.✓

4.1.6 Since high temperatures reduce a lubricant's viscosity,✓ components are more prone to wear and tear.✓

(6 × 2) (12)

4.2
- The lubricant recommended by the manufacturer
- The recommended viscosity number
- Whether a viscosity index improver must be added
- The recommended grade or quality of the lubrication
- The recommended oil group (5)

4.3
- Collect evidence.
- Take measurements.
- Study maintenance records and operational reports. (3)

[20]

QUESTION 5

5.1
- Details of the equipment
- Date of maintenance
- Details about the condition of the equipment
- Tools and consumables used during maintenance
- The time (man hours) it took to carry out the maintenance
- The persons who carried out the maintenance
- The work done
- Recommendations for future reference (8)

5.2
- Flammable chemicals must be stored in a flammable-liquid storage cabinet.
- All containers must be properly labelled.
- Appropriate PPE must be worn when chemicals are handled.
- All containers must be securely closed.
- Store flammable chemicals away from high temperatures.
- Do not store flammable materials near oxygen cylinders. (6)

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5.3
- All rigging equipment must be thoroughly checked before use.
- The area under the hoist must be cleared when in use.
- A competent person must operate the equipment.
- All defective rigging equipment must be scrapped.
- The safe working load must be checked before using the equipment.
- Correct slinging methods must be used. (6)

[20]

TOTAL: 100

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