higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NONNATIONAL CERTIFICATE: ENGINEERING CERTIFICATE OF COMPETENCY

SPECIALISED ELECTRICAL INSTALLATION CODES

(Second paper)

9 April 2021

This marking guideline consists of 5 pages.

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QUESTION 1

1.1 He/she shall ensure, as far as is reasonably practicable,✓ that nothing about the manner in which it is erected or installed✓ makes it unsafe or creates a risk to health when properly used.✓ (3)

1.2 If the person who is going to use the article undertakes in writing to take specified steps sufficient to ensure,✓ as far as is reasonably practicable, that the article or substance will comply✓ with all prescribed requirements and will be safe and without risk to health when properly used,✓ the undertaking shall have the effect of relieving the first-mentioned person from the duty imposed upon him/her✓ to such an extent as may be reasonable, having regard to the terms of the undertaking.✓ (5)

1.3
1.3.1 officer
1.3.2 section
1.3.3 includes
1.3.4 acting

(4 × ½) (2)
[10]

QUESTION 2

2.1 This part of the IEC 60079 series contains the specific requirements for the design, selection, erection✓ and initial inspection of electrical installations in,✓ or associated with, explosive atmospheres.✓ (3)

2.2 Group I, Group II and Group III. (1)

2.3 Group I is for mines✓ and Group II for surface industries.✓ (2)

2.4 Place in which an explosive atmosphere consisting of a mixture of air with flammable substances✓ in the form of gas or vapour is present continuously✓ or for long periods or frequently.✓ (3)

2.5 Electrical apparatus in which all the circuits are intrinsically safe. (1)
[10]

QUESTION 3

3.1
- Verify that the equipment is appropriate or suitable for the zone/EPL.
- Verify that the equipment gas group is correct.
- Verify that the maximum surface temperature of the equipment is correct. (3)

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3.2 The exposed conductors shall be:

- Correctly terminated in an appropriate enclosure.
- Isolated from all sources of power supply and insulated.
- Isolated from all sources of power supply and earthed. (3)

3.3 Labels shall be inspected to ensure that they are legible✓ and comply with the requirements laid down in the appropriate documentation✓ to ensure that the equipment actually fitted is that specified.✓ (3)

3.4 They shall be inspected at regular intervals✓ and shall be replaced if found to be damaged or defective.✓ (2)
[11]

QUESTION 4

4.1 Action to restore faulty equipment to its fully serviceable condition✓ complying with the relevant standard.✓ (2)

4.2 The relevant documentation, along with the records of any repairs, overhauls, alterations or modifications,✓ should be kept by the user✓ and made available to the repairer.✓ (3)

4.3 It is the responsibility of the user✓ to ascertain that the repair facility concerned can demonstrate compliance✓ with the relevant stipulations of this standard.✓ (3)

4.4 Cable/conduit entry systems should be checked to ensure that they are undamaged✓ and are appropriate to the equipment type of protection.✓ (2)
[10]

QUESTION 5

5.1
- Is qualified by virtue of his/her knowledge, training, skills and experience,✓ to organise the work and its performance and regulations.✓
- Is familiar with the provisions of legislation and regulations✓ which apply to the work to be performed.✓
- Has been trained to recognise any potential danger or actual danger✓ to health or safety in the performance of the work.✓
- Is in possession of an appropriate certificate of competency✓ where such certificate is required by the regulations.✓ (4 × 2) (8)

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5.2
- The batteries of such equipment shall not be replaced in hazardous areas✓ unless the batteries have been certified as intrinsically safe in their own right.✓
- Such replacement batteries shall be exactly of the same type✓ (and in some cases, manufacturer) as was originally certified for the specific equipment.✓ (2 × 2) (4)

[12]

QUESTION 6

6.1 Liquid that has a closed-cup flash point at or above 38 °C. (1)

6.2 Liquid with a flashpoint below 38 °C regardless of its temperature,✓ or a liquid with a flash point at or above 38 °C being handled at temperatures at or above its flash point.✓ (2)

6.3
6.3.1 G
6.3.2 B
6.3.3 C
6.3.4 D
6.3.5 F
6.3.6 E
6.3.7 A

(7 × 1) (7)

[10]

QUESTION 7

7.1
7.1.1 True
7.1.2 True
7.1.3 True
7.1.4 False

(4 × 1) (4)

7.2 Certificate that is issued by a registered person✓ in respect of an electrical installation or part of an electrical installation.✓ (2)

7.3 Report that is issued by a registered person✓ in respect of an electrical installation or part of an electrical installation.✓ (2)

7.4
7.4.1 Electrical contractor✓ or any person under the control of a registered person.✓ (2)

7.4.2 Electrical contractor✓ or any person under the control of a master installation electrician.✓ (2)

7.4.3 Electrical tester for single phase,✓ or installation electrician,✓ or master installation electrician.✓ (3)

7.4.4 Installation electrician✓ or master installation electrician.✓ (2)

7.4.5 Master installation electrician. (1)
[18]

QUESTION 8:

8.1
- A loop diagram showing all equipment and cabling or wiring.✓
- Information about the equipment characteristics indicated on the loop diagram✓ and in the form of a certificate by an ATL.✓
- Information about cabling and wiring indicating cable types and lengths✓ as well as resistance, capacitance and inductance characteristics.✓ (5)

8.2 50 mm (1)

8.3 8.3.1 True
8.3.2 True
(2 × 1) (2)

8.4
- The enclosure will be strong enough to withstand an internal gas explosion✓ without sustaining permanent mechanical damage.✓
- The enclosure will have well-defined flameproof paths✓ with dimensions that are specific for the gas where the equipment will be used.✓
- The external surface temperature of the equipment will be below the ignition temperature of the gas or dust✓ where the equipment will be used.✓ (3 × 2) (6)

8.5 Flammable substance, oxygen and an ignition source (1)

8.6 Intrinsically safe equipment housed in a flameproof enclosure (1)

8.7 By means of a bushing✓ with separately encapsulated cores✓ (2)

8.8 Conduits should be sealed off by means of compound filled boxes (1)
[19]

TOTAL: 100

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