higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

SPECIALISED ELECTRICAL INSTALLATION CODES
(First paper)

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This marking guideline consists of 5 pages.

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QUESTION 1: OCCUPATIONAL HEALTH AND SAFETY ACT, ACT 85 OF 1993 – ELECTRICAL INSTALLATION REGULATIONS

1.1 Any person who employs or provides work for any person✓ and remunerates that person or expressly or tacitly undertakes to remunerate him/her,✓ but excludes a labour broker. ✓ (3)

1.2 Any person who is employed by or works for an employer✓and who receives or is entitled to receive any remuneration✓or who works under the direction or supervision of an employer or any other person. ✓ (3)

1.3 Any premises or place where a person performs work in the course of his/her employment. ✓ (1)

1.4
- The severity and scope of the hazard or risk concerned.✓
- The state of knowledge reasonably available concerning that hazard or risk✓ and of any means of removing or mitigating that hazard or risk.✓
- The availability and suitability of means to remove or mitigate that hazard or risk.✓
- The cost of removing or mitigating that hazard or risk about the benefits deriving therefrom. ✓ (5)

[12]

QUESTION 2:

2.1 2.1.1 Every employer shall provide and maintain, as far as is reasonably practicable, a safe working environment ✓and without risk to the health of his/her employees.✓ (2)

2.1.2 Taking all necessary measures to ensure that the requirements of this act are complied with by every person in his/her employment✓ or on-premises under his/her control where plant or machinery is used. ✓ Enforcing such measures as may be necessary for the interest of health and safety. ✓ (3)

2.2 Every self-employed person shall conduct his/her undertaking in such a manner as to ensure, as far as is reasonably practicable,✓ that he/she and other persons who may be directly affected by his/her activities✓are not thereby exposed to hazards to their health or safety.✓ (3)

[8]

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QUESTION 3: SANS 60079-10-1: 2016 EXPLOSIVE GAS ATMOSPHERES

3.1 A method of analysing and classifying the environment where explosive gas atmospheres may occur,✓so as to facilitate the proper selection, installation and operation of equipment✓ to be used safely in that environment.✓ (3)

3.2 Those who understand the relevance and significance of the properties of the flammable substances✓ and principles of gas/vapour dispersion,✓and those who are familiar with the process and the equipment.✓ (3)

3.3 (i) relevant
(ii) plant
(iii) methodology
(iv) continuing
(v) undertaken
(vi) regular

(6 × 1) (6)
[12]

QUESTION 4: SANS 60079-10-2: 2018 EXPLOSIVE DUST ATMOSPHERES

4.1 This part of IEC 60079 is concerned with the identification and classification of areas✓ where explosive dust atmospheres and combustible dust layers are present,✓ in order to permit the proper assessment of ignition sources in such areas.✓ (3)

4.2 Mixture with air, under atmospheric conditions, of flammable substances in the form of dust,✓which, after ignition, permits self-sustaining propagation.✓ (2)

4.3 Zone 20,✓ Zone 21✓ and Zone 22.✓ (3)

4.4 By housekeeping,✓ and the level of housekeeping shall be known for the purpose of classification.✓ It is essential to agree on the nature of the housekeeping with plant management.✓ (3)
[11]

QUESTION 5: SANS 60079-0: 2019 EXPLOSIVE ATMOSPHERES – GENERAL REQUIREMENTS

5.1 F
5.2 I
5.3 G
5.4 J
5.5 A
5.6 C
5.7 E
5.8 D
5.9 H
5.10 B

(10 × 1) **[10]**

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QUESTION 6: SANS 10123: 2014 THE CONTROL OF UNDESIRABLE STATIC ELECTRICITY

6.1
- An effective means exists for the generation of static electricity✓
- A means exists for the accumulation of the separated charges✓ and attaining sufficient potential difference between them✓
- A static discharge, having sufficient energy for ignition, occurs between the separated charges✓ and the discharge occurs in or on a flammable material✓ (5)

6.2 It is primarily governed by its energy, which will be some fraction of the total amount of electrical energy✓ contained in the charged object from which the discharge emanates.✓ (2)

6.3 6.3.1 The conductors need not be insulated but should be sufficiently robust✓ to withstand all mechanical and corrosive influences likely to occur.✓

6.3.2 By soldering,✓ welding or suitable screwed terminations.✓

(2 × 2) (4)
[11]

QUESTION 7: SANS 10142-1-1: 2018 LOW-VOLTAGE INSTALLATIONS IN MEDICAL LOCATIONS

7.1
- Has an AC internal impedance of at least 100 kΩ.✓
- Has a test voltage not exceeding 25 V DC.✓
- Is of a current, even under fault conditions, not exceeding 1 mA d.✓
- Shall indicate, at the latest, when the insulation resistance has decreased to 5 kΩ.✓ A test device shall be provided to test this facility to ensure that the alarm (audible and visual)✓ operates when the insulation resistance reaches 5 kΩ.✓ (6)

7.2
- Necessarily comes into physical contact with the patient✓ for the equipment to perform its function✓or
- Can be brought into contact with the patient✓ or
- Needs to be touched by the patient.✓ (4)

[10]

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QUESTION 8: SANS 10108: 2017 THE CLASSIFICATION OF HAZARDOUS LOCATIONS AND THE SELECTION OF EQUIPMENT FOR USE IN SUCH LOCATIONS

8.1 This standard covers the classification of surface and underground locations✓ in which fires or explosions can occur owing to the presence of flammable gases, vapours or mists, dust, fibres or flying in the air✓ in order to permit the proper selection of electrical equipment and mechanical equipment,✓ such as compression-ignition engines (diesel engines), to be used in such locations.✓

The classification is based on the type of substance liable to cause a fire or an explosion,✓ and on the frequency or probability of the occurrence of explosive conditions.✓ (6)

8.2 This standard does not cover locations that are rendered hazardous by the presence of substances that are flammable✓ or explosive in the absence of atmospheric oxygen.✓ It also does not cover major releases caused by catastrophic plant failures,✓ such as the rupture of tanks, pressure vessels or pipes.✓ (4)

[10]

QUESTION 9: GENERAL
Explosion-protected equipment selection and use in hazardous locations

9.1 Ex: – Explosion protected/protection
d:– flameproof protection
I – gas group (mines)
T1 – temperature class (4)

9.2	9.2.1	(a) Yes✓	(b) Yes✓	(c) Yes✓	(d) Yes✓
	9.2.2	(a) Yes✓	(b) Yes✓	(c) No✓	(d) No✓
	9.2.3	(a) Yes✓	(b) No✓	(c) No✓	(d) No✓

(12)

[16]

TOTAL: 100

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