

**DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA**

NON-NATIONAL CERTIFICATE: SPECIALISED ELECTRICAL
INSTALLATION CODES

SPECIALISED ELECTRICAL INSTALLATION CODES

(Second Paper)

TIME: 3 HOURS

MARKS: 100

APRIL 2013

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
 2. Read ALL the questions carefully.
 3. Number the answers according to the numbering system used in this question paper.
 4. Write neatly and legibly.
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QUESTION 1: GENERAL

The following are terms used when risk profiles for explosive atmospheres are considered.

Give a brief explanation of each of the following:

- 1.1 Ignition temperature of a flammable liquid
- 1.2 Upper explosive limit (UEL) of a gas/vapour
- 1.3 Lower explosive limit (LEL) of a gas/vapour
- 1.4 Flash point of a gas/vapour
- 1.5 Relative density of a gas/vapour

(5 × 3) [15]

QUESTION 2: OCCUPATIONAL HEALTH AND SAFETY ACT (ACT 85 OF 1993)

- 2.1 Which act of 1985 was incorporated into the Occupational Health and Safety (OHS) Act, Act 85 of 1993?
- 2.2 In which government department does jurisdiction of the OHS Act reside?
- 2.3 The chief inspector of occupational health and safety is responsible for ensuring that all places of employment comply with the requirements in the Act. This includes underground mine activities as well.

Is this statement TRUE or FALSE?
- 2.4 What does the abbreviation GME which sometimes appears on explosion protected equipment stand for?
- 2.5 Name TWO regulations incorporated in the OHS Act which form an integral part of specialised electrical installations.

(5 × 1) [5]

QUESTION 3: SANS 10142, PART 1, 2008: THE WIRING OF PREMISES (LOW VOLTAGE INSTALLATIONS)**3.1 Certificate of Compliance (CoC)**

3.1.1 For how long is a certificate of compliance valid according to the abovementioned standard? (2)

3.1.2 A qualified electrical engineer with 5 years' experience in the petrochemical engineering field may issue a certificate of compliance for a specialised electrical installation without being registered by the Department of Labour as a master installation electrician.

Is this statement TRUE OR FALSE? (1)

3.1.3 Name at least THREE documents you will have to add to a certificate of compliance for a specialised electrical installation as required by the inspection and test document. (3)

3.2 Additional inspection and test document for a medical location

3.2.1 Name the standard that previously dealt with the wiring requirements of medical locations. Reference to this standard is still found in hospitals. (1)

3.2.2 State which standard has replaced the previous one referred to in QUESTION 3.2.1. (1)

3.2.3 Which TWO aspects related to the patient require special attention when evaluating a specialised electrical installation in a medical location? (2)

3.3 Additional certificate of compliance for a hazardous location

3.3.1 A certificate of compliance can be issued for an electrical installation in a potentially hazardous location which have not been zoned (classified) yet.

Is this statement TRUE or FALSE? (1)

3.3.2 Any change to the production process that influences the classification of the hazardous location does not affect the electrical certificate of compliance for the particular installation.

Is this statement TRUE or FALSE? (1)

[12]

QUESTION 4: SANS 60079 – 17, 2009: THE INSPECTION AND MAINTENANCE OF EQUIPMENT USED IN EXPLOSIVE ATMOSPHERES

- 4.1 The scope of any standard reveals information regarding the content of the standard.
Give the scope of this standard. (4)
- 4.2 Define the following terms used generally in this standard:
- 4.2.1 Maintenance
- 4.2.2 Inspection (2 × 2) (4)
- 4.3 A technical person having executive functions must be identified for each installation and must carry out certain tasks relative to that installation.
Name FIVE of these tasks. (5)
- 4.4 Write brief notes explaining the maintenance requirements of the following aspects for specialised electrical installations:
- 4.4.1 Flexible cables (3)
- 4.4.2 Withdrawal from service (3)
- 4.4.3 Equipment and circuit identification (2)
- 4.4.4 Cable gland tightening (2)
- 4.5 State the requirements regarding intrinsic safe parts of a specialised electrical installation using the following headings:
- 4.5.1 The documentation required to validate compliance to an approved standard (3)
- 4.5.2 Cable screens (2)
- 4.5.3 Separation between intrinsic and non-intrinsic safe circuits (2)

- 4.6 Using an alternative risk assessment approach for the acceptance of Ex equipment

Explain the following abbreviations associated with this alternative approach:

4.6.1 EPL

4.6.2 Ma

4.6.3 Gb

4.6.4 Da

4.6.5 Dc

(5 × 2) (10
[40])

QUESTION 5: SABS 086, PART 3: THE INSTALLATION, INSPECTION AND MAINTENANCE OF EQUIPMENT USED IN EXPLOSIVE ATMOSPHERES PART 3: REPAIR AND OVERHAUL OF APPARATUS USED IN EXPLOSIVE ATMOSPHERES

- 5.1 Information regarding explosion prevention equipment should be made available by the manufacturer to the user to facilitate repair and overhaul work.

Name THREE categories of information required. (3)

- 5.2 The repairer shall ensure that people directly concerned with the repair or overhaul (or both) of certified explosion-protected apparatus are trained and supervised for this type of work. Training records shall be kept.

Name THREE aspects that such training shall cover. (3)
[6]

QUESTION 6: SABS 089, PART 2: THE PETROLEUM INDUSTRY PART 2: ELECTRICAL INSTALLATIONS IN THE DISTRIBUTION AND MARKETING SECTOR

- 6.1 Explain the difference between *flammable liquid* and *combustible liquid* as defined in the abovementioned standard. (3)

- 6.2 This standard also refers to the grade of release of flammable liquids, vapours and gasses.

Define the following subcategories of release:

6.2.1 Primary release (2)

6.2.2 Secondary release (2)

6.3 Static electricity is a high-risk aspect in the petrochemical industry.

Explain how this could be controlled in the following circumstances:

- | | | |
|-------|---------------------------------------------------------------------------|-----|
| 6.3.1 | Static electricity generated by filters and strainers | (2) |
| 6.3.2 | Rail sidings used for bulk loading and offloading of flammable substances | (2) |
| 6.3.3 | Switch-loading of class 1, class 2 and class 3 products | (2) |
| 6.3.4 | The refilling of small portable containers | (3) |
| 6.3.5 | Hand-operated drum pumps | (2) |
| 6.3.6 | Containers used for transporting class I products | (2) |

[20]

QUESTION 7: SANS 60079 – 19, 2011: ELECTRICAL APPARATUS FOR EXPLOSIVE GAS ATMOSPHERES PART 19: REPAIR AND OVERHAUL FOR APPARATUS USED IN EXPLOSIVE ATMOSPHERES (OTHER THAN MINES OR EXPLOSIVES)

Draw the TWO symbols of which either one should be shown on apparatus that has been repaired by an approved repairer.

[2]

TOTAL: 100